REPUBLIC OF KENYA

MINISTRY OF WATER & SANITATION

KENYA WATER SECURITY & CLIMATE RESILIENCE PROGRAM

PROJECT ID 117635 CREDIT NO. 5268-KE

FINAL ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT PROJECT REPORT

FOR

CONSULTANCY SERVICES FOR PREPARATION OF ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT (ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR NORTH MAINLAND PIPELINES, MOMBASA COUNTY

Works carried out under

CONTRACT: MOWI/KWSCRP-1/007/2016-2017

Report Prepared by:

Zamconsult Consulting Engineers

JULY 2019

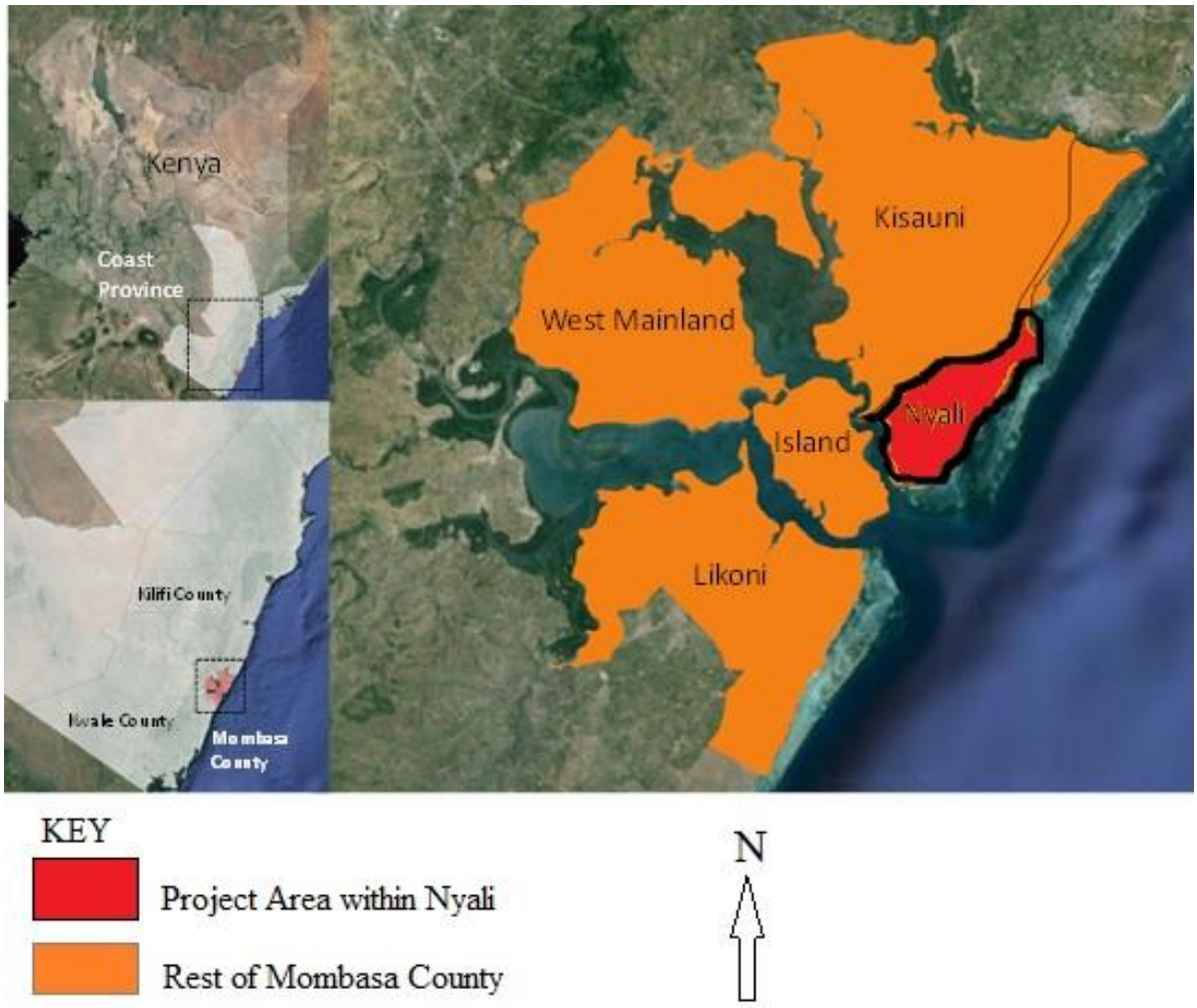
ESIA EXECUTIVE SUMMARY

Background

The Ministry of Water and Sanitation is the overall government body charged with ensuring water resources availability and accessibility by all within the country. It does this through water service providers and water boards within the country in meeting its mandate.

As part of meeting its mandate, the Ministry of Water and Sanitation is undertaking an ambitious agenda for the water sector through a long-term, transformational program aimed at building water security and climate resilience for economic growth and social wellbeing. The Kenya Water Security and Climate Resilience Program (KWSCRP) responds to this need.

One of the projects under KWSCRP is Component 1: Mwache Dam and Related Investments. One of the investments under this component is the improvement of pipelines in Nyali area of Mombasa North Mainland. The project area is shown in the map below:



The proposed project will be covered under Component 1 as a sub component titled program for Improvement of Water Services in Mombasa County Non-Revenue Water. In particular the proposed works intends to improve the water services in Mombasa North Mainland.

The Mombasa North Mainland is considered the most populous region in Mombasa. North Mainland consists of two constituencies: Kisauni and Nyali. North Mainland forms one of the four zones earmarked for network development and NRW reduction implementation. The other three zones are South Mainland (Likoni), West Mainland and Island. Each of these zones is targeted in NRW reduction strategy, which seeks to measure, monitor and evaluate how efficiently the utility delivers services, based on set and agreed performance indicators. As such the area will greatly benefit from the proposed project.

The proposed project improve water services in the Mombasa North Mainland through the improvement of the water infrastructure and zoning.

Within the North Mainland, Nyali sub-county consisting of Nyali and Kongowea areas have been earmarked as a priority area for the replacement and augmentation of pipelines. These pipelines are shown in the map below:

Zamconsult Consulting Engineers has been contracted to undertake the ESIA and RAP for the proposed project.

The Mombasa Water Supply and Sanitation Company (MOWASCO), will be the main beneficiary of the project and will be in charge of operating and maintaining the water pipelines after the completion of works.

Need for the Project and the ESIA

The Mombasa North Mainland receives its water from the Nguu Tatu Reservoir, however has a very old pipe network, subject to water losses. A situational analysis conducted in the project area identified that Non-revenue water in North Mainland amounted to 49% in the period from September 2015 to January 2016, showing great losses in the system and losses for MOWASCO.

The analysis also established that only some parts of the network will need replacement and not a complete overhaul of the entire network, which needs to be done before the completion of Mwache Dam to accommodate the increased supply. In addition, Recent works on one of the sources of water to Mombasa North Mainland, the Baricho wellfield has been undertaken, thus the need to improve the distribution within the project area through the improvement of the pipeline.

The laws of Kenya (EMCA and the Constitution) and World Bank Policies identify the need for an Environmental and Social Impact Assessment for the proposed works, presented in this report.

Based on the World Bank operational policy 4.01, the entire project component 1: Mwache Dam was identified as category A, due to its significant adverse impacts including, massive biodiversity loss and displacement. However due to the localized low risk impacts of the proposed pipelines within Nyali Sub-County, which will be covered under this project the proposed pipelines are categorized as category A however the project will not warrant the controls that come with a category "A" risk rating .

Study Methods

The study approach and methodology adopted included screening to determine the extent of the project and desktop data search and analysis for the baseline bio-physical and social environmental parameters of the project area. In addition, the consultant worked with the project design group and was briefed and obtained design approaches to be used which informed the requirements of the environmental reporting process and for which excerpts have been obtained on salient design information. The Consultant engaged on multi-faceted public consultation process which included ad hoc roadside interviews, household social and environmental surveys using structured questionnaires duly analysed and key informant interviews to institutions and lead agencies and public consultation meetings. Based on these findings and expert judgement, the consultant has compiled the projected social and environmental impacts (positive and negative) likely to emanate from proposed project activities and the Environmental and Social Management Plan (ESMP) which details how adverse impacts will be reduced or eliminated and by whom.

Legislative Framework for this Study

The principal National legislation governing issues of environmental concern in Kenya is the Environmental Management & Coordination (Amended) Act of 2015 typically referred to as EMCA. EMCA calls for Environmental Impact assessment (EIA) (under Section 58) to guide the implementation of environmentally sound decisions and empowers stakeholders to participate in sustainable management of the natural resources. Projects likely to cause environmental impacts require that an environmental impact assessment study to be carried out. It is under this provision that the current study has been undertaken.

Other legislation adhered to during this study are the regulations borne of EMCA Cap 387 namely the Environmental Impact Assessment and Audit Regulations 2003; The Environmental Management Coordination Act (Waste Management) Regulations 2006; the Environmental Management Coordination (Water Quality) Regulations 2006; and the Environmental Management and Coordination (Noise and Excessive vibration pollution Control) Regulations2009 (Legal Notice 61), Air quality Regulations 2009 among others.

Sectoral legislation applicable to this Project include the Water Act (2016), the Constitution, The Public Health Act (CAP. 242), among others.

In addition to the local legislation, the Consultant identified the various World Bank operational policies relevant to the project. Some of these policies include Operational Policy (OP) 4.01, OP 4.12, as well as the World Bank Policy on Access to Information, 2010.

Conclusions from Public Consultation

Part of the ESIA process includes conducting public consultation with the local community within the project area. The Consultant conducted 3 types of meetings:

i. High level meetings with the Client, Local Administrative leaders, political leaders and MOWASCO
ii. Mid level meetings with the Nyali Resident's Association
iii. Low level meetings in open public forums in several residential and informal settlements.

During these meetings the major outcome is that the area currently suffers greatly due to water shortages and paying for bills although they have not had access to water. These meetings highlighted the urgent need for the project and the implementation of Mwache Dam in order to improve water supply to the area.

Expected impacts

The expected impacts emanate from the Planning phase, the Construction Phase, the Operation phase and the De-commissioning Phase of the project.

In general, successful implementation of the project will have high environmental and socioeconomic benefits to the people and will contribute to their health and well-being. Overall, negative expected impacts are related to the planning and construction activities of the project. These impacts are localized and not considered significant and long-lasting and can be mitigated through appropriate mitigation measures. The severity and duration of these impacts can be minimized by ensuring that the construction and operation activities adhere to the proper construction and operation standards specified by the design and supervision engineers.

The positive benefits of the project will include:

i. Employment during construction
ii. Improved water supply
iii. Reduced non-revenue water

The major negative impacts of the project will be felt during the planning, construction and decommissioning of the project and include:

i. Site Related Oil Spills
ii. Soil Related Impacts
iii. Impact on Water Resources
iv. Air Quality
v. Noise Pollution
vi. Impact on flora and fauna

Biophysical Impacts

vii. Generation of solid waste
viii. Loss of structures within the road reserve
ix. Loss of livelihoods within the road reserve
x. Loss of trees lawns and fences within the road reserve
xi. Traffic Congestion Socio-Economic Impacts
xii. Public Health & Safety

xiii. HIV & AIDS Impacts
xiv. Gender empowerment
xv. Service Delivery Impacts
xvi. Crime Management
xvii. Child Labour and Protection
xviii. Gender Equity, Sexual Harassment
xix. Liability for loss of life, injury or damage to private property
xx. Decommissioning of old pipelines
xxi. Decommissioning of the Contractor's camp

Social Impacts

Environmental & Social management Plan (ESMP)

This was prepared to reduce, minimize or altogether eliminate the adverse impacts. Positive impacts are project enhancements and do not require mitigation.

The ESMP is fully described in chapter 8 of this report, however the table below presents the identified environmental and social impacts, their mitigation measures and the party responsible for carrying out the mitigation measures, in summary.

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
Pre-construction	Loss of structures within the road reserve	As a first step, the owners, type of structures are identified. The compensation will be done in accordance to the RAP.	KWSCRP/MOWASCO/ County government/National Land Commission	Values as per RAP Report	Lumpsum
Pre-construction	Loss of livelihoods within the road reserve	Loss of livelihoods to be valued and compensated to in accordance to the RAP	KWSCRP/MOWASCO/ County government/National Land Commission	Values as per RAP Report	Lumpsum
Pre-construction	Loss of trees lawns and fences within the road reserve	Loss of assets to be valued and compensated to in accordance to the RAP	KWSCRP/MOWASCO/ County government/National Land Commission	Values as per RAP Report	Lumpsum
Construction	Traffic Congestion	Provide and implement a traffic management plan Provision temporary road signs or notices to indicate ongoing works. Effecting traffic controls to avoid congestion and accidents on roads. Choosing suitable traffic routes to reduce the impact in the neighbourhood. Ensuring no interference with traffic through traffic control, designated parking, speed limits and hiring a banksman.	Contractor supervised by the Resident Engineer	50,000	Monthly
Construction	Site Related	Employee awareness on company	Contractor supervised	25,000	Annually

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	Oil Spills	procedures for dealing with spills and leaks from oil storage tanks. Containment of leaks. Provision of absorbent material Maintenance of contractor's plant Provision of relevant emergency numbers	by the Resident Engineer	100,000	Annually
Construction	Soil Related Impacts	Stock piling of soil for reuse Provision temporary drainage channels or holding ponds as a precautionary measure Restoration of the ground by sowing adequate grass cover and planting of trees. Planning emergency response measures in case of accidental oil spills. Following successful water testing, the Contractor should replace the removed overburden to original level to allow for revegetation and reduce public health and safety impacts.	Contractor supervised by the Resident Engineer	250,000 Restoration of ground costs covered under loss of flora and fauna Oil spill costs covered	Lumpsum
Construction	Impact on Water Resources	Provide a waste management plan Proper solid and liquid wastes disposal mainly from the construction camps, sites and offices. Ensuring proper measures are in place for	Contractor supervised by the Resident Engineer	250,000 Oil spill costs covered	Annually

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		collection and disposal of spilled oils and lubricants. Provision of hand held water quality assessment equipment.		50,000 Lumpsum	
Construction	Socio-Economic Impacts	Hiring unskilled construction and skilled (if available) labour from the local population as far as possible. Use of manual labour during excavation and construction works where possible. Prepare a labour influx plan to manage labour influx Sensitizing workers and the surrounding community on awareness, prevention and management of HIV / AIDS. Provide an on-site clinic to provide VCT services. Enforcing and maintaining a code of conduct for his employees Ameliorate positive socio-economic impacts	Contractor supervised by the Resident Engineer Public Health Officer Contractor supervised by RE and MOWASCO	Included in the Contractor's Cost Included in HIV/AIDS Impacts 1,000,000	Lumpsum
Construction	Air Quality	Use of protective clothing like dust masks on construction crew.	Contractor supervised by the Resident	Included in PPE Costs	

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		Take baseline air quality measurements and annual measurements to monitor air quality. Provision of hand held air quality assessment equipment. Regular water spraying of murram and earth roads and construction sites Operated and maintenance of contractor's plant in compliance with relevant vehicle emission standards and manufacturer's specification to minimize air pollution.	Engineer	5,000 per sample 50,000 Included in contractor's cost	Annually Lumpsum
Construction	Noise Pollution	Avoiding night time construction when noise is loudest near residential areas. No discretionary use of noisy machinery within 50 m of residential areas and near institutions or use of manual labour in these sections. Good maintenance and proper operation of construction machinery. Where possible, ensure non mechanized construction to reduce the use of machinery Baseline and annual noise measurement Provision of hand held ambient noise quality assessment equipment.	Contractor supervised by the Resident Engineer	Included in Contractor's cost 40,000 per sample 40,000	Lumpsum
Construction	Impact on	Re-planting the indigenous vegetation as	Contractor supervised	500,000	Lumpsum

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	flora and fauna	much as possible once work is completed. Taking into account recommendations from stakeholders and in communication with KFS Sparing the vegetation that must not necessarily be removed. Provide a waste management plan Promoting non-mechanized methods of construction. Ensuring protection of the flora and fauna by proper handling of cement during civil works. Ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks Provision of dustbin and sanitation facilities.	by the Resident Engineer County Officer- Water Energy and Natural Resources	Included in Contractor's cost	
Construction	Public Health & Safety	Ensuring proper maintenance and operation of Contractor's plant. Providing crossing areas for access to cut off businesses and structures. Provide and implement an occupational health and safety plan. Contractor to come up with a plan for	Contractor supervised by the Resident Engineer Appointed Health and Safety Officer	Included in Contractor's cost 50,000	Lumpsum Provisional

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		dealing with asbestos based on NEMA guidelines for approval by the RE. Appointing a trained occupational health and safety staff and fire marshal on-site for the duration of the construction work. Providing workers with appropriate personal protective equipment (PPE). Provide workers with adequate drinking water and breaks. Provide workers training on safety procedures and emergency response. Roads passing through population centers will be water sprayed to reduce dust. Work to minimize or altogether eliminate mosquito breeding sites. Provide a waste management plan. Cordon off trenches and working areas with a reflective tape to ensure safety of pedestrians and provide crossing areas for access to cut off businesses and structures. Providing clean toilets for workers, these toilets will be to World Health Organisation standards.		500,000 50,000 500,000 50,000 250,000 Included in air quality cost 50,000 5,000 Included in contractor's cost 300,000	Monthly Bi-annually Monthly Bi-annually Bi – annually Monthly Lumpsum
Construction	HIV & AIDS	Sensitizing workers and the surrounding	Contractor	75,000	Bi-annually

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	Impacts	communities on awareness, prevention and management of HIV/AIDS. Provide an on-site clinic to provide VCT services to construction crew and provision of ARVs for vulnerable community members	Appointed Health and Safety Officer Public Health Officer	50,000	Monthly
Construction	Gender empowerment	Ensuring equitable distribution of employment opportunities between men and women Providing toilets and bathrooms for both male and female workers on site	Contractor supervised by the Resident Engineer	Included in Contractor's cost Included in public health cost	
Construction	Service Delivery Impacts	Provide a traffic management plan which will provide alternative routes, traffic controllers, concrete barriers and speed limits for motorists. Communication any intended disruption of the services. Repair or facilitate the repair of any utilities that are interfered with during construction. Cordoning off trenches. Repair of any affected areas in consultation with the local authorities. Ensure pipelines are laid deep enough to prevent interference with the relevant road	Contractor MOWASCO County government KURA Relevant service provider	Included in traffic costs Included in contractor's cost 10,000 Included om contractor's cost	Monthly

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		sides, roads and walkways; and return reserve areas and road crossings to the state they were before construction.			
Construction	Crime Management	Fencing off the Contractor's camp with plant and materials. Working with local committees in addition to the Contractor's own security. Removing any employee who persists in any misconduct or lack of care, carries out duties incompetently or negligently, fails to conform to any provisions of the contract, or persists in any conduct which is prejudicial to safety, health, or the protection of the environment. Taking all reasonable precautions to prevent unlawful, riotous or disorderly conduct by or amongst the contractor's personnel. Prohibiting alcohol, drugs, arms, and ammunition on the worksite among personnel. Logging all events of a criminal nature that occur at the worksite or are associated with the civil works activities. Reporting all activities of a criminal nature on the worksite or by the contractor's	Contractor supervised by the Resident Engineer	Included in Contractor's cost	

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		employees to the police.			
Construction	Child Labour and Protection	Provide and implement a child protection strategy Ensuring no children are employed on site in accordance with national labour laws Ensuring that any child sexual relations offenses among contractors' workers are promptly reported to the police	Contractor supervised by the Resident Engineer Local Administration	Included in contractor's cost	
Construction	Gender Equity, Sexual Harassment	Provide and implement a gender based violence strategy, which will include: Gender mainstreaming in employment at the worksite with opportunities provided for females to work, in consonance with local laws and customs Grievance redress mechanisms including non-retaliation. Provide and implement an employee code of conduct The works contractor should be required, under its contract, to prepare and enforce a No Sexual Harassment and Non-Discrimination Policy, in accordance with national law where applicable.	Contractor supervised by the Resident Engineer Local Administration	50,000	Lumpsum
Construction	Liability for loss of life,	Provision of PPE.	Contractor supervised by the Resident	Included in Contractor's	

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	injury or damage to private property	Training workers on the operation of the machinery and equipment Adequate warning and directional signs. Ensuring that the prepared code of conduct for staff is followed to prevent accidents. Developing a site safety action plan. Cordoning off unsafe areas Provision of first Aid kit within the construction site. Recording of all injuries that occur on site in the incident register, corrective actions for their prevention are instigated as appropriate. Compliance with the Workmen's Compensation Act, ordinance regulations and union agreements. Repairing any damage done to private property.	Engineer Appointed Health and Safety Officer	cost	
Construction	GRC Facilitation Costs	Locational GRCs will be set up to ensure all potential grievances are logged and resolved and will need a cost which will be included in the implementation costs	Contractor, RE and MOWASCO	1,500,000.00	Annually
Operation	Generation of solid	Provision of adequate waste disposal facilities.	MOWASCO		

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	waste	Implementation of the sanitation masterplan which includes.			
Decommissioning	Decommissioning of old pipelines	Provide a hazardous material management plan, especially the Asbestos Cement Pipes. Provide a waste management plan for all the removed pipelines	Contractor	500,000.00	
Decommissioning	Decommissioning of the Contractor's camp	Provide and implement a decommissioning plan including revegetation, disposal of waste material, and recycling of recyclable material.	Contractor	Included in the Contractor's cost	

Institutional Framework for the Implementation of the ESIA

The Table below provides the proposed institutional framework for the implementation of the ESIA

Name of Institution	**Role of Institution**
Ministry of Water and Sanitation	Will be an overall implementing agency. Central agency responsible for holding all information on the ESIA and RAP. Mobilization of financial resources from Government/ County Governments for resettlement and compensation purposes of the approved ESIA and RAP.
Kenya Water Security and Climate Resilience Program (KWSCRP)	Program under the Ministry of Water and Sanitation in the implementation of the project. Represent the ministry in the project.
MOWASCO	Responsible for day to day coordination and implementation of the project. Oversee the contractor's work Seek approval from NLC for the acquisition of way leave. Assist in the establishment of the GRCs and Site Office Committee. Establish the GRCs and Site Office Committee operations. Ensure the grievance committees are established and working. Monitor the ESMP implementation.
NEMA	Provide approval of the ESIA report Review and provide a NEMA license for the ESMP. Escalate unsolvable grievances to the tribunal.
Site Office Committee	Ensure effective flow of information between the Contractor and public Coordinate GRCs and assist in resolution of escalated grievances Coordinate activities between the various institutional stakeholders and the general public. Conducting extensive public awareness and consultations with the aggrieved parties so that they can air their concerns, interests and grievances.
Grievance Redress Committee (s) (GRC)	Conduct extensive public awareness and consultations. Help ensure that local concerns raised by stakeholders

	as regards environmental and social issues among others are promptly addressed by relevant authorities. Resolve manageable disputes that may arise. If it is unable to resolve, help refer such grievances to the Site Office Committee. Ensure that the concerns of vulnerable persons such as the disabled, widowed women, orphaned children affected by the project are addressed and included.
Supervisor/Department Head	Oversees the day to day activities on the site of an activity. First recipient of a grievance from a staff member. Based on the severity of the grievance the Supervisor can solve it or escalate it to the Contractor's Human Resource Manager.
Contractor's Human Resource Manager	The Contractor's human resource manager will be in charge of the entire work force within the Contractor's camp. As such he/she will be in charge of the employment procedures, misconduct, conformance to labour laws and overall staff wellbeing, which includes second level grievances.
County Employee Relations	Receive unresolved complaints from employees Establish the legality of the complaint Provide a resolution on unresolved complaints in accordance to the various laws

Conclusion

As has been alluded in this report, the following can be said in summary.

The implementation of the proposed improvements on the distribution network in Nyali area in Mombasa North Mainland will be a major step in improving the water infrastructure in preparation for the completion of Mwache Dam as well as reduce Non-Revenue Water in the project area. In addition, following the different projects aimed at augmenting the water supply in Mombasa North Mainland (Increase of wells at the Baricho Wellfield), the improved infrastructure in Nyali will convey the increased water to the residents of Nyali, before the completion of Mwache Dam.

The ESIA concludes that although the full positive environmental benefits will not be felt until the Mwache Dam is implemented, however the short term benefits will also be beneficial in the supply of water in the new pipelines from the augmented supply to Mombasa.

The adverse impacts on the physical and natural environment will be "in sum total," not significant, and can be handled through the recommended mitigation measures at the costs highlighted in the ESMP. Compensation for demolition of structures and livelihood will be done through a detailed Resettlement Action Plan which is provided under a separate report.

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ACRONYMS AND ABBREVIATIONS

AC	Asbestos Concrete
AIDS	Acquired Immunodeficiency Syndrome
ARV	Antiretroviral Drugs
CBO	Community Based Organization
CDE	County Director of Education
CIDP	County Integrated Development Plans
CLO	Community Liaison Officer
CPHO	Chief Public Health Officer
CWSB	Coast Water Services Board
dB	Decibels
DI	Ductile Iron
DMA	District Metered Area
DMZ	District Metered Zone
EHS	Environmental Health and Safety
EMCA	Environment Management Coordination Act
ESMMP	Environmental and Social Mitigation and Management Plan
ESMP	Environmental and Social Monitoring Plan
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
GI	Galvanized Iron
GIIP	Good International Practice
GIS	Geographical Information System
GoK	Government of Kenya
GHG	Greenhouse Gases
GPS	Global Positioning System
HDPE	High Density Poly Ethylene
HIV	Human Immunodeficiency Virus
ID No.	Identity Card Number
IFC	International Finance Corporation
KAPP	Kenya Agricultural Productivity
KES	Kenya Shillings
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KPLC	Kenya Power and Lighting Company

K.Shs.	Kenya Shillings
KFS	Kenya Forestry Service
KURA	Kenya Urban Roads Authority
KWSCRP	Kenya Water Security and Climate Resilience Program
KWS	Kenya Wildlife Service
MDG	Millennium Development Goals
MOWASCO	Mombasa Water and Sewerage Company
Mg/l	Milligrams per Litre
MOWS	Ministry of Water and Sanitation
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NMK	National Museums of Kenya
NPEP	National Poverty Eradication Plan
NRW	Non-Revenue Water
O&M	Operation and Maintenance
OP	Operational Policy
PAP	Project Affected Person
PEC	Poverty Eradication Commission
PMU	Project Management Unit
PPE	Personal Protective Equipment
PPR	Polypropylene Random
PVC	Poly Vinyl Chloride
RAP	Resettlement Action Plan
RE	Resident Engineer
STD	Sexually Transmitted Diseases
uPVC	ultra Poly Vinyl Chloride
UFW	Unaccounted-for Water
US$	United States Dollar
VEI	Vitens Evides International B.V.
WaSSIP	Water and Sanitation Service Improvement Project
WaSSIP-AF	Water and Sanitation Service Improvement Project – Additional Financing
WASREB	Water Services Regulatory Board
WB	World Bank
WHO	World Health Organisation
WRMA	Water Resources Management Authority

WSB	Water Services Board
WSP	Water Services Provider
WSS	Water Supply and Sanitation Services
WSSD	World Summit for the Social Development
m^3	cubic metres
VOCs	Volatile Organic Compounds
CH_4	Methane
CO_2	Carbon Dioxide
IC	Individual Service Connection
NC	Communal Service Connection
WTP	Water Treatment Plant
Mbgl	metres below ground level

1 INTRODUCTION

1.1 MINISTRY OF WATER AND SANITATION

The Ministry of Water and Sanitation is the overall government body charged with ensuring water resources availability and accessibility by all within the country. It does this through water service providers and water boards within the country in meeting its mandate.

The government has planned a large-scale water investment program to close the massive water infrastructure gap that has been estimated at US$5-7 billion. This is to be supported by the establishment of a strong and modern institutional and legal structure that aligns the water sector with the Constitution of Kenya 2010 through a Water Bill reflecting the new devolution framework under discussion in Parliament. Towards this end, the Ministry of Water and Irrigation is undertaking an ambitious agenda for the water sector through a long-term, transformational program aimed at building water security and climate resilience for economic growth and social wellbeing. The Kenya Water Security and Climate Resilience Program (KWSCRP) responds to this need.

1.2 KENYA WATER SECURITY AND CLIMATE RESILIENCE PROGRAM (KWSCRP)

The first phase of the program, (KWSCRP-1) was approved by the World Bank board on June 18th, 2013 and declared effective on October 24th, 2013. The project development objectives of KWSCRP-1 are to:

i. Increase availability and productivity of irrigation water for project beneficiaries; and
ii. Enhance the institutional framework and strengthen capacity for water security and climate resilience for the country.

KWSCRP-1 focuses on the progressive development of a water investment pipeline, integrated and participatory basin planning, and technical assistance to the evolving water sector institutions and sector reforms at a critical period of constitutional and political transition.

The Coastal Region Water Security and Climate Resilience Project (KWSCRP-2) is the second operation under the program and its design is consistent with the approach envisaged for the program in that investment preparation follows a sound investment framework and incorporates a multi-sectoral, multi-dimensional approach. The project will improve access to water and sanitation, general health conditions and quality of life among poor urban and rural households that currently rely on expensive water sources and are exposed to serious health risks due to lack of sanitation.

It will also contribute to Kenya's Vision 2030 and sectoral plans for water and sanitation to ensure that improved water and sanitation are available and accessible to all. These activities are being developed and aligned with Kwale and Mombasa County Integrated Development Plans (CIDPs). The project has three main components supporting the project development objective:

1. Component 1:Mwache Dam and Related Investments
2. Component 2:Kwale County Development Support
3. Component 3:Project Management

1.2.1 Proposed North Mainland Pipelines in Mombasa County

The proposed project will be covered under Component 1 as a sub component titled program for Improvement of Water Services in Mombasa County Non-Revenue Water. In particular the proposed works intends to improve the water services in Mombasa North Mainland.

The Mombasa North Mainland is considered the most populous region in Mombasa. North Mainland consists of two constituencies: Kisauni and Nyali. North Mainland forms one of the four zones earmarked for network development and NRW reduction implementation. The other three zones are South Mainland (Likoni), West Mainland and Island. Each of these zones is targeted in NRW reduction strategy, which seeks to measure, monitor and evaluate how efficiently the utility delivers services, based on set and agreed performance indicators. As such the area will greatly benefit from the proposed project.

The proposed project improve water services in the Mombasa North Mainland through the improvement of the water infrastructure and zoning.

1.3 NEED FOR THE ESIA

Article 42 of the constitution identifies the rights of every person to a clean and healthy environment. Thus highlighting the need for this analysis of the proposed works, and their impacts on the project in accordance to further Kenyan legislation.

Further to this, the project is funded by the World Bank, which has several environmental and social safeguards. These are rules that the World Bank must follow when it creates and carries out its projects. These safeguards call for environmental and social impact assessments with varying levels of detail based on the category of the project.

Based on the World Bank operational policy 4.01, the entire project component 1: Mwache Dam was identified as category A, due to its significant adverse impacts including, massive biodiversity loss and displacement. However due to the localized low risk impacts of the proposed pipelines within Nyali Sub-County, which will be covered under this project the proposed pipelines are categorized as category A however the project will not warrant the controls that come with a category “A” risk rating .

1.4 OBJECTIVE OF THIS REPORT

The main objective of this report will be to identify the potential impacts of the project on the physical, biological and social environment surrounding the project, with an aim of mitigating the negative impacts and augmenting the positive impacts.

1.5 METHODOLOGY OF WORK

To commence the works the Consultant’s team had an initial meeting with the Client in both the Nairobi and Mombasa PMU offices in order to kick off the ESIA process, agree on the terms of reference for conducting the ESIA and establish a working relationship.

The next step included screening and a site reconnaissance and preparation of an inception report which included an updated methodology for conducting the ESIA. Following the screening process, the impacts of the project were seen to be confined only to the pipeline wayleaves and nearby physical, biological and social environments. As such the project was identified as category A with low risk and site specific as such do not warrant the controls that come with a typical Category A project.

Following the inception report the Consultant undertook the ESIA study, which included a desktop study, field investigations and data collection, stakeholder identification and engagement, impact assessment and mitigation measure development. These steps are highlighted in the sections below:

1) *Desktop Study*

This mainly involved;

- Review of the Design Report for North Mainland Water Supply prepared by Vitens Evides International, including subsequent annexes to the report. In order to establish the project scope, background and potential impacts.
- Assembly and review of baseline data, maps, reports and any relevant information on the existing environmental and social conditions of the Project Area influenced by the proposed development; The Consultant reviewed the design report prepared by Vitens Evides, the housing and population census 1999, National Aids Control Council HIV County profiles, Mombasa County strategic plans, among others.
- Review of existing Legislation, Regulation and Policies relevant to the proposed Project;
- Review of previously carried out ESIA reports and Construction Inputs, including anticipated technical processes if any.
- Preparation of checklists that consist of a simple catalogue of environmental factors which are compared to the activities to be developed.
- Early meetings with the Client to deliberate on the proposed project, keeping in mind the site and activity options under consideration;

2) *Field Investigations and Data Collection*

Activities implemented during field investigations involved;

- Site visits to the Project Area and the neighboring areas within the zone of influence of the project.
- Photographing the significant aspects to aid in describing baseline environmental and social conditions of the Project area and its influence zone.
- Acquisition of relevant documents from the authority such as County government departments, Roads parastatals, among others which were within the Project influence zone.
- Identifying and mapping of potential sensitive environmental and social receptors within the project area of influence including schools, churches, informal settlements, in order to establish the people or environments that may suffer disproportionately due to the project and find solutions to mitigating the measures.
- Collection of baseline environmental and social data which will be used for monitoring purposes throughout the different phases of the project.

The main purpose of the field investigation was to verify information and data collected during the desktop study and collection of any new information that may assist in the assessment of impacts and design mitigation measures.

3) *Stakeholder Identification and Engagement*

The consultant conducted the following steps in identifying and engaging the various stakeholders to the project:

- Stakeholder identification and mapping which included. Stakeholder mapping included identifying the key stakeholders are these included other actors in the water

sector within the project area, the various road authorities, health offices, education, county officials, local leaders as well as the general public in the project area. Following the identification of the different stakeholders, different methods of engaging with these stakeholders based on their roles and positions were devised. For officials either from the county or central government key informant interviews would be used, questionnaires, ad hoc interviews and public consultation meetings for the general public.

- Stakeholder Engagement was done in form of Onsite key informant interviews with various departments within the county government (water, roads, health), road parastatals (KURA); questionnaires distributed randomly to the residents within the various areas; ad hoc interviews with interested persons; and public consultation meetings in form of meetings with resident associations and barazas in the informal settlements.

4) Impact Identification, Analysis and Mitigation Measure Development

Following the fieldwork and desktop studies, the Consultant identified the potential impacts from the project and activities. The impacts were analysed divided based on

- Nature if the impact was positive or negative
- Effect; if the impacts were direct or indirect
- Direct: applies to impacts which can be clearly and directly attributed to a particular
- Time Range; if the impacts were short term, medium term or long term
- Reversibility; if the impacts were reversible or irreversible

Following the impact identification, the Consultant identified mitigation measures for the negative impacts and methods of augmenting the positive benefits of the project. Mitigation measures were provided using best practice measures in the industry as well as health and safety guidelines provided by the various laws and policies.

2 PROPOSED PROJECT DESCRIPTION

2.1 LOCATION

The project is located within Nyali Sub County within Mombasa North Mainland of Mombasa County, as shown in the map below:

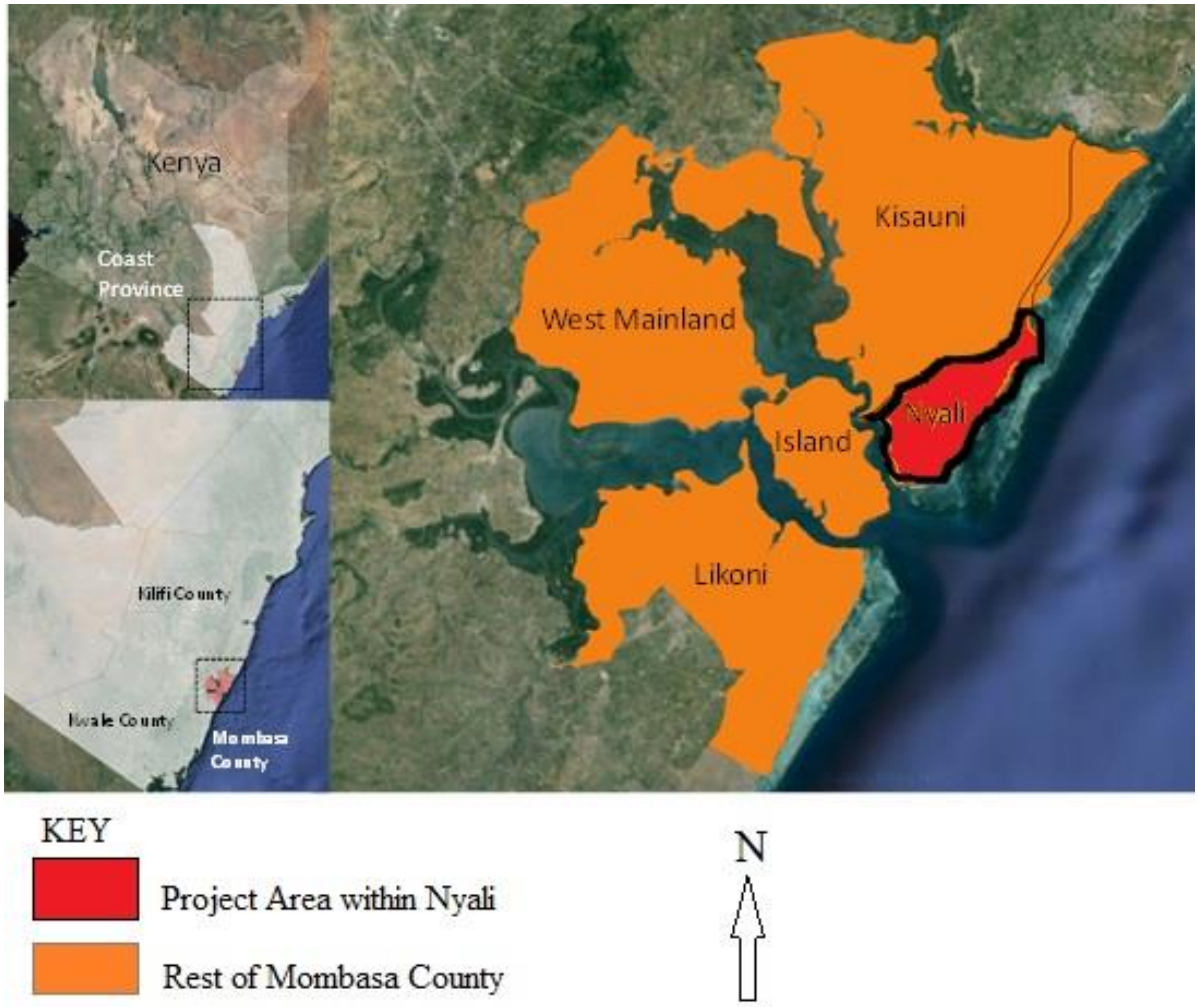


Figure 2-1: Map Showing the Location of the Project Area

The proposed pipelines are all scattered within the Nyali Sub-County with the centre at GPS Co-ordinates 4°02'36.39" S and 39°42'06.28" E.

2.2 PROJECT BACKGROUND

2.2.1 Current Water Supply

Mombasa County is currently supplied by four major water sources:

1. Baricho Wellfield.
2. Mzima Springs.
3. Marere springs.
4. Tiwi Boreholes.

The summary of the sources and the quantities of water supplied to Mombasa from the above sources is summarized in Table 2-1 below:

Table 2-1: Summary of Water Sources for Mombasa County

Source	**Production capacity (m^3/d)**	**Supply to Mombasa (m^3/d)**		
		2006-2011	**2013**	**Q1 and Q2 2015**
Baricho	83,000	25,206	28,596	27,713
Mzima springs	35,000	17,849	13,364	12,951
Marere springs	12,000	2,965	2,202	2,134
Tiwi boreholes	13,000	1,880	1,649	1,598
Total	**143,000**	**47,900**	**45,811**	**44,396**

The Mombasa North Mainland (project area included) gets its water from the Nguu Tatu reservoir. The reservoir has a capacity of 27,100 m^3. According to the design report for the North Mainland water supply by Vitens Evides International in 2017 highlights that the current water supply only meets 29% of the net demand in Mombasa (Vitens Evides, 2017, pg. 22).

2.2.2 Current Water infrastructure

A situational analysis of the pipeline networks was carried out and identified the distribution network in Mombasa summarized in Table 2-2 below:

Table 2-2: Distribution Network in Nyali

Material	**Length (km)**	**Length (%)**
AC	52.7	18%
Cast Iron	11.9	4%
Concrete	0.4	0%
GI	72.1	24%
HDPE	46.0	15%
PPR	3.6	1%
uPVC	114.2	38%
Total	**300.9**	

The situational analysis also identified that Non-revenue water in North Mainland amounted to 49% in the period from September 2015 to January 2016, showing great losses in the system and losses for MOWASCO.

The analysis also established that only some parts of the network will need replacement and not a complete overhaul of the entire network.

2.2.3 Previous Projects and proposed Projects in the Area

There are several projects that have been or are in the process of implementation, of particular benefit of the Mombasa North mainland are the Water and Sanitation Service Improvement Project (WaSSIP) project and Mwache Dam.

5) Water and Sanitation Service Improvement Project (WaSSIP)

The Water and Sanitation Service Improvement Project (WaSSIP) targets the improvement of distribution of water supply in Mombasa County and surrounding areas, the improvement of access to waste water services in part of Island and some others works. Both of the main activities comprised of detailed feasibility studies and phased construction by expansion or rehabilitation of existing systems for water and waste water in and around Mombasa County. The Kipevu waste water treatment plant was also rehabilitated under the WaSSIP program. Other works were the rehabilitation of the Tiwi and Sabaki well fields, and construction of new Marere pipeline with funding from Agence Française de Developpement (AfD).

Coast Water Services Board, with funding from the World Bank sought to improve water and sanitation in Mombasa under WaSSIP. Some of the endeavors under WaSSIP focused on improving water distribution in Mombasa North Mainland under Mombasa Lot 1 and 2 projects. The map below shows the pipelines that were improved and constructed under the WaSSIP program:

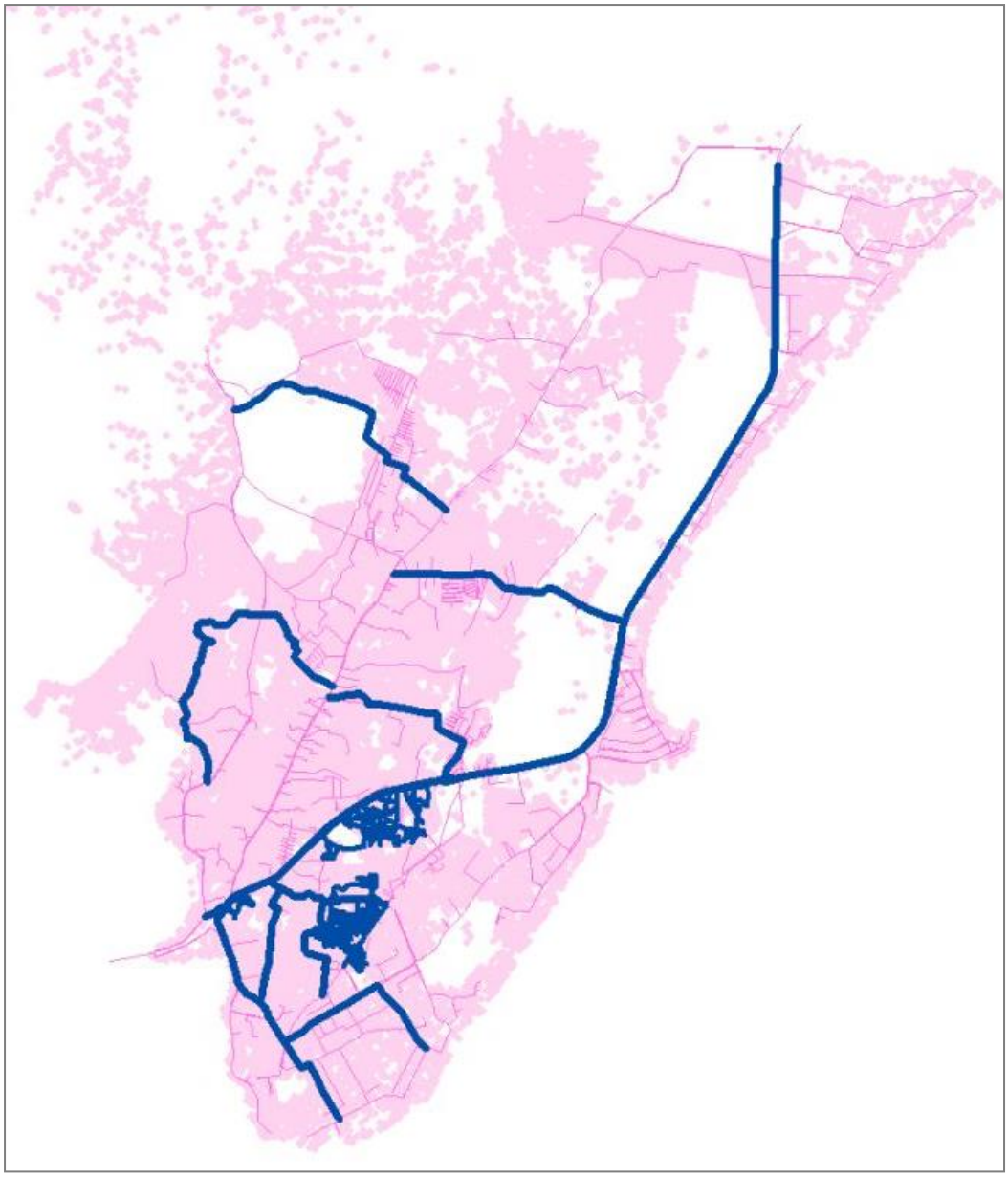


Figure 2-2: Map of the Pipelines (in Blue) laid by WaSSIP

The pipelines although extremely useful, have not fully covered the required improvements needed in the distribution network of the Mombasa North Mainland.

6) Establishment of District Metering Areas (DMAs)

Six pilot DMAs were established in the four main district metered zones (DMZs) of MOWASSCO in 2016, initially with good result. The pilots showed a significant reduction of NRW and increase of billing. The knowledge and experience from the pilot DMAs was the basis for the design and recommendation for establishment of DMAs throughout Mombasa.

It was the intention to scale-up the successes of the 6 pilot DMAs to MOWASSCO's DMZs, starting in North Mainland, followed by West Mainland, and subsequently Likoni and Island. However, the organizational changes have interfered with this intention. The whole water network is to be broken down into easily measured, controlled and managed units (i.e. DMAs), where water balances can be established on monthly basis and NRW reduction strategies employed effectively and with economic sustainability.

2.3 PROPOSED PROJECT AND ITS OBJECTIVES

The main aim of the project will be to reduce NRW water in the project area as well as improve the water infrastructure in Mombasa North Mainland in preparation for the water from the construction and completion of Mwache Dam.

The NRW will be reduced through the design of DMAs for easy management of areas to prevent losses.

Due to limited funds, several pipelines have been earmarked for immediate improvement under the priority works in the Nyali area.

2.4 DESIGN COMPONENTS

This chapter identifies the baseline used to design the improvements as well as the specific improvements that will be made on the storm water system.

2.4.1 Design Population

The current and future populations for the proposed project were based on the Mombasa County Master Plan. The following are the proposed population projections for the Nyali area

Table 2-3: Population Data based on Mombasa County Masterplan

Sub County	Area (km^2)	2009			2035		
		Population	Population Density (P/Km^2)	Population Distribution (%)	Projected Population	Projected Density (P/Km^2)	Assigned population dustribution (%)
Nyali	22.79	185,990	8161	19.8	473,084	20,758	20.5 (+0.7)

2.4.2 Design Demand

The design consultant based the water demand for the area based on a previous projection carried out by Mangat and Egisbceom, which estimated that the 2030 water demand 87,200m^3/day. VEI further projected that the demand for the year 2035 based on the following criteria:

Table 2-4: Design Criteria

Description	**Parameters**
Design horizon 2035	Based on the Urban Master Plan Mombasa County
24/7 supply, no rationing	Peak factor 2.0
Domestic and non-domestic water consumption	27% non-domestic use
Low level NRW	20% NRW

Based on the design criteria, taking into account development in the area, the demand was computed as:

- Average demand of 107,080 m^3/day;
- Peak demand of 214,159 m^3/day.

2.4.3 Project Components

1) Primary, Secondary and Tertiary Pipelines

The design of the distribution network of North Mainland primarily aimed to structure the distribution system to facilitate ease of establishment of DMAs, increase in the absorptive capacity and major extension of the supply network coverage. The design entailed new pipelines, existing distribution network in good condition, strategic interconnections between these two systems and also revised interconnections within the old system. The approach was based on:

- The existing network which is quite extensive and generally of reasonable quality and will therefore form an integral part of the future network;
- Coverage of the network which is very much extensive in the Nyali area and central Kisauni areas. The revised network extends the network substantially in these areas with limited service but existing habitations, and takes into account planned developmental areas, as well as the envisaged structure of the network in view of the future additional supply of water;
- Increase in distribution capacity of the network to meet water demand in 2035.

The final pipelines are subdivided based on functionality:

- Primary pipelines: These form the backbone of the distribution network. Diameters vary from 150 to 900 mm with a total length of approximately 73 km with 46 km being newly designed lines;
- Secondary pipelines: connection between the primary lines and the DMAs. These ensure minimal takeoffs from the primary lines, maintain network structure and ease of segmenting the network into separated smaller areas. Pipe diameters range from 150 to 250 mm and pipes not classified as primary. The secondary lines are approximately 105 km with 80 km being newly designed lines;
- Tertiary pipelines: Pipelines providing final supply to the consumers. Diameters vary from 110 mm to 50 mm with a total length of approximately 260 km with 126 km being newly designed lines.

The pipelines proposed are summarized in the table below:

Table 2-5: Summary of the Proposed Primary, Secondary and Tertiary Pipelines

Diameter (mm)	**Length (m)**
50	2,590
63	17,116
75	33,003
110	80,520
160	49,587
200	16,269

250	8,430
315	9,114
350	6,016
400	12,342
500	12,796
800	3,383
1000	1,401
Total	**252,567**

The pipelines will made up of HDPE, steel and uPVC in the following distributions

Table 2-6: Summary of pipeline materials

Material	**Length (m)**
HDPE	133,229
Steel	35,937
uPVC	83,400
Total	**252,567**

2) DMAs

The size and the number of projected connections per district metered area (DMAs) are as shown in the table below. These figures represent potential connection based on spatial identification of households/buildings within the DMA and as per the field survey of the project area. In each area there may be consumers of low, medium or high income. The number of connections per DMA varies from 200 to 6,300, because some areas are densely populated, yet are still considered a single DMA.

The table below shows the proposed DMAs

Table 2-7: Proposed DMAs

DMA	**DMA Area (km^2)**	**Existing Buildings**	**Flow Meters**	**Valves**
NML00	0.8	1,463	4	6
NML01	0.7	1,729	4	14
NML02	1.2	1,961	5	12
NML03	1.1	1,515	4	4
NML04	2.6	2,979	1	4
NML05	2.8	6,277	3	12
NML06	5.1	2,412	2	16
NML07	1.9	1,884	3	12
NML08	2.9	2,927	3	1
NML09	1.0	2,263	6	12

DMA	DMA Area (km^2)	Existing Buildings	Flow Meters	Valves
NML10	0.9	2,319	1	7
NML12	1.3	596	1	11
NML13	2.6	1,167	6	13
NML14	2.0	3,470	5	15
NML15	3.1	2,303	3	22
NML16	1.7	1,415	8	13
NML17	2.6	5,408	2	24
NML18	4.2	1,433	5	17
NML20	1.7	3,310	6	8
NML22	1.4	809	3	5
NML24	1.4	3,634	4	7
NML25	1.2	1,299	4	16
NML26	2.2	1,133	1	7
NML28	2.2	4,531	2	12
NML29	3.9	2,430	2	3
NML30	3.5	1,914	2	5
NML31	6.8	3,572	2	4
Baobab	1.1	770		4
Kiembene Estate	0.4	950	1	
Bombolulu	0.5	696		
Vescon	1.1	190		

3) Establishment of Priority Areas for Investment

Due to limited funds from the project priority pipelines were established based on the following criteria:

1. Good availability and/or increase of water in the coming years;
2. Increase of the number of new customers;
3. Increase of revenue for Mombasa Water;
4. Increase supply to important customers (Industry, Hotels, etc.);
5. Extend water infrastructure to DMAs which are currently not or insufficient supplied with water (social aspect

Based on the above criteria, the pipelines earmarked for investment in Nyali include:

Lot 1D Replacement of existing pipelines (most AC) and improving system capacity in high NRW areas in parts of Nyali, covering about 6 DMAs. The total pipelines

(primary, secondary and tertiary) due for replacement amount to 64,929m. The pipeline materials vary from HDPE, steel and uPVC.

The area under lot 1D is shown in the figure below:

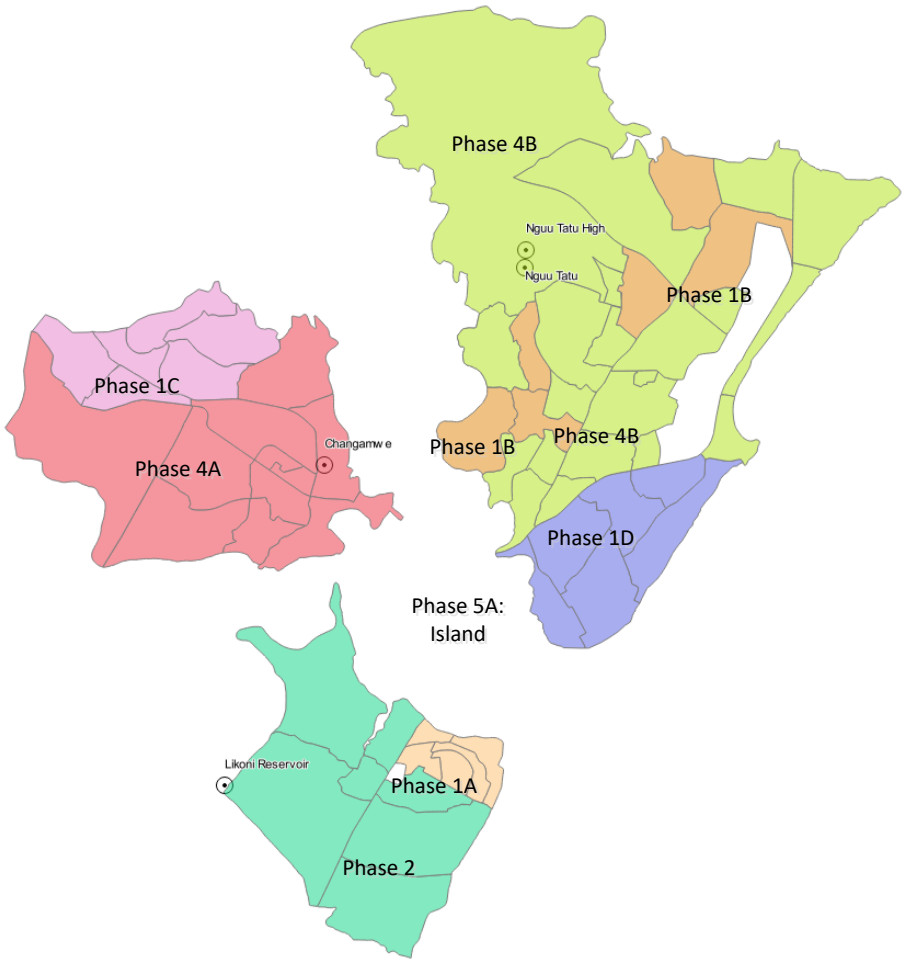


Figure 2-3: Lot 1D highlighted in purple as Phase 1D

The replacement of the lines in the project

This alternative to the project will cost K.Shs. 530,000,000.

The pipelines under phase 1D are presented in appendix 11.4 of this report.

2.4.4 Project Activities

The proposed works within the priority areas will include the following activities:

1) *Setting up of Contractor's Camp and Delivery of Materials*

Commencement of works will involve the setting up of the Contractor's offices and camp, and delivery of construction plant and materials to the camp. The Contractor will liaise with the project resident engineer or the client on the selection of this site.

2) *Site Preparation*

The construction phase of the project will include setting out the pipeline wayleaves, ground clearing of vegetation within the pipeline wayleaves, provision of cordons for the works.

3) Trenching works

In order to lay the new pipelines, the contractor will dig trenches alongside the old pipelines. The depth of the trench will vary depending on the pipe diameters but will not exceed 2m. Similarly the width of the trenches will range between 1m and 2m to allow for safe working space for works to be conducted within the trenches.

4) Laying of Pipelines

This will involve placing the pipelines, valves and connections within the trenches, and bending them where necessary.

5) Water Testing and decommissioning of the old pipelines

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

Some of the old pipelines will be decommissioned. Usual practice has involved leaving the old pipes underground and laying the new pipes alongside the new ones. As such they should form no permanent threat, however if the client requires the removal of the pipelines, then the Contractor will remove and dispose of the pipes following the NEMA and World Bank approved procedures.

6) Soil replacement on pipelines and decommissioning of the old pipelines

Following successful installation of the water pipes, the Contractor will bury the new pipes and provide the necessary signage for the pipelines, valves and chambers. Cover vegetation including grass, lawns, and flowers will be replanted. In sections that were previously paved, the Contractor will repave these areas to the specifications of the respective road authority or individual.

The existing AC pipelines will be decommissioned and new pipelines will commence works. Due to the nature of the asbestos it is proposed to leave them buried, due to the detrimental effects of asbestos fibres on the respiratory system, however procedures in case the AC pipelines are accidentally uncovered, have been provided in appendix of this report.

2.4.5 Project Raw Materials

The proposed project materials based on the design report will include:

i. HDPE, Steel and uPVC pipes
ii. Steel valves, fittings and chambers
iii. Sand, Aggregate, Cement, reinforcement and Water for Concrete works on the various chambers.

The project works will require minimal concrete works and earthworks which will not require the establishment of borrow sites or quarries.

2.4.6 Expected Wastes from Project Activities

The construction activities are expected to produce minimal waste and spoil since any overburden removed from the site will be replaced after laying of the pipelines. The following are some of the wastes foreseen during the construction based on the Consultant's general experience in the field of ESIA and RAP as well as the RAP conducted at the same time:

i. Spoil from land clearing and excavation works, mostly grass, roots, a few trees, road paving, cabbro blocks, etc.

ii. Decommissioned pipelines if removed.
iii. Debris from construction and demolition works; (Scrap materials, nails, bricks, concrete, timber, Steel; timber; plastic materials, existing surface dressing)
iv. Hazardous waste such as cement residue; oils, gases, paints, and AC pipes.
v. Wastes from the sanitation facilities for the construction workers.
vi. Storm Water (only during the rainy season
vii. Solid waste from the Contractor's camp from food scraps, food packaging, etc.
viii. Gaseous waste from combustion products from construction engines, welding gas, etc.

3 ALTERNATIVES TO THE PROJECT

3.1 TECHNOLOGY FOR OPTIONS FOR CONSTRUCTION

The two options used for trenching works and laying of pipelines can be done using two main methods, mechanized methods or human labour to dig the trenches, lay the pipelines, and re-cover the pipes after laying.

Using machines in the trenching process will indeed be faster and more efficient in working, however, the machines will require a larger wayleave and maneuvering room leading to more inconvenience in terms of traffic along the roadside, or cause massive destruction of property to make room for the machines.

Using human labour to dig trenches will require less space for working as well as provide benefits in form of employment and community buy in.

During consideration of these alternatives to the project, the best option which was considered in this ESIA, is to make use of human labour for trenching, and burying of trenches, machinery can be used to ferry and lift the heavy pipelines. However in areas where it is difficult to use human labour (hard ground, rock surfaces, unsafe areas, etc.), machinery for trenching will be used.

3.2 ALTERNATIVE PIPELINE ROUTES

The project area is in an urban area, densely populated in some areas. The existing pipelines scheduled for replacement are extremely old whose locations may now be in private land following developments in the area. As such this alternative to the pipelines proposes to follow the existing pipeline routes provided that they are located within road reserves. In addition if the existing pipelines pass through private land, the proposed pipelines be rerouted to follow existing road reserves and paths. This should be done in order to avoid any unnecessary resettlement.

This alternative to the project has been incorporated into the design of the proposed pipeline and this will be considered under this ESIA.

In addition being that the project area is urban, no further alternative sites were looked into due to the fact the pipelines do not pass through any environmental sensitive areas that require avoidance as such the option of maintaining the pipelines within existing road reserves, access routes was incorporated into this report.

3.3 ALTERNATIVE WATER SOURCES

The main source of water to Nyali subcounty, and the general Mombasa North Mainland is through the Nguu Tatu Reservoir, which receives its water from the Baricho Wellfield. The Baricho Wellfield recently underwent expansion to increase water supply.

Mombasa County and in particular Mombasa North Mainland currently has no access to freshwater, as such sources its water from neighbouring counties. The main alternative source has come to the forefront in recent times is desalination of ocean water. However this method will require additional investment, in desalination plants and electricity sources, as such was not considred. In addition the construction of Mwache dam which has already been earmarked for construction will be adequate to meet the demand for water to Mombasa.

No other alternatives were looked into for additional water were looked into.

3.4 NO ACTION ALTERNATIVE

The No Action Alternative is the future without the planned Project. This alternative involves making the use of the existing pipelines instead of replacing.

The do nothing alternative will leave the residents of Nyali with inadequate access to water as a result of high NRW and poor quality water as a result of the Asbestos Piping.

4 PHYSICAL, BIOLOGICAL AND SOCIAL BASELINE CONDITIONS OF AFFECTED ENVIRONMENT

This Section discusses the baseline situation in respect of climate, topography, air quality, soils and geology, hydrology, terrestrial ecology, cultural heritage sites and socio-economic structure as well as existing infrastructure and utilities such as water, sewerage, transportation network, electricity, air transport and telephone/telecommunications and water sources and adequacy management in the region of the proposed project.

4.1 PHYSIOGRAPHIC AND ENVIRONMENTAL CONDITIONS

4.1.1 Location

The Mombasa North Mainland is located within Mombasa County which is located in the South-Eastern part of the Coastal region of Kenya. It covers an area of 229.9 Km^2 excluding 65 Km^2 of water mass which is 200 nautical miles into the Indian Ocean. It borders Kilifi County to the North, Kwale County to the South West and the Indian Ocean to the East. The County lies between latitudes 30°56' and 40°10' South of the Equator and between longitudes 39°34'and 39°46'east of Greenwich Meridian. The County also enjoys proximity to an expansive water mass as it borders the Exclusive Economic Zone of the Indian Ocean to the East. Nyali is one of the two sub-counties located in Mombasa North Mainland:

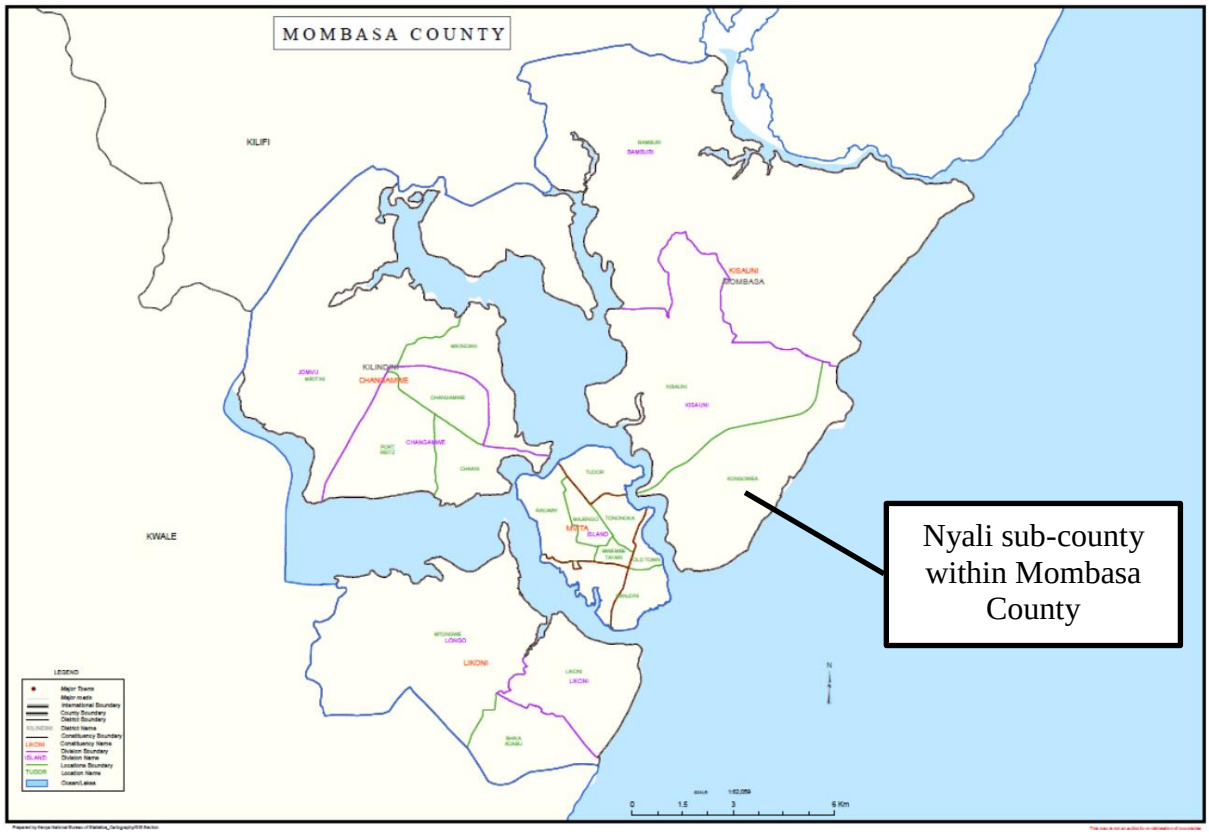


Figure 4-1: Location of Mombasa Island within Mombasa County

4.1.2 Topography

Mombasa County lies within the Coastal lowland which rises gradually from the sea level in the East to about 132m above sea level in the mainland. The terrain is characterized by three distinct physiographic features, which include the coastal plain, which is found along the shoreline. The plain consists of an expansive flat land with raised beach terraces covered mainly by Coral limestone and back reef sand deposits that not only provide firm foundation for construction but also provide building materials. The project area is located within the coastal plain in some areas and the coastal plain in most areas.

4.1.3 Climate

Mombasa County has a monsoon type of climate, with the rainfall pattern is characterized by two distinct long and short seasons corresponding to changes in the monsoon winds. The long rains occur in April – June with an average of 1,040mm and correspond to the South-Eastern Monsoon winds. The short rains start towards the end of October lasting until December and correspond to the comparatively dry North-Eastern Monsoons, averaging 240mm. The annual average rainfall for the county is 640mm.

The annual mean temperature in the county is 27.9°C with a minimum of 22.7°C and a maximum of 33.1°C. The hottest month is February with a maximum average of 33.1°C while the lowest temperature is in July with a minimum average of 22.7°C. Average humidity at noon is about 65 per cent.

4.1.4 Geology

Close to the Indian Ocean the area is underlain by coral limestone of Pleistocene age. Further inland are the Magarini sands and Mazeras sandstones of the Tertiary and Triassic ages respectively. Study sites were selected to be within the dominant lithologies of coral limestone and sandstone.

4.1.5 Biodiversity

Nyali borders the Indian Ocean to the south. The Indian Ocean is home to a wide range of flora and fauna, including plankton, seaweed, various species of fish including parrot fish, snapper, white snapper, cod and zebra fish, molluscs including squid and octopus. The various flora and fauna within the Indian Ocean are shown in the figures below

Figure 4-2: Some of the fish species within the Indian Ocean

Vegetation in the area increases towards the beaches. The major flora includes Neem, Indian Ashok, Palms, Mango and Coconut trees as shown in the figure below:

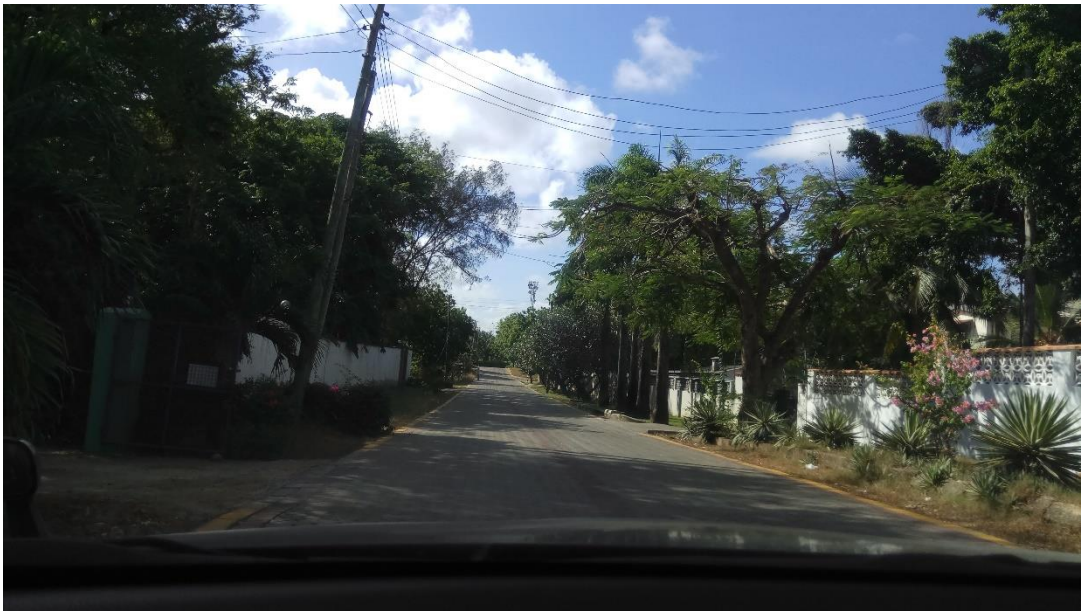


Figure 4-3: General Vegetation in the Project Site

Some trees have negatively impacted the existing pipelines in the area. Of particular concern are the roots of neem trees, which coil around pipelines and destroy them. Some of the impacts are shown in the figure below:

Figure 4-4: Relationship between some trees and existing infrastructure

No endangered species of trees was encountered along the pipeline routes, due to the nature of the project area. Most of the vegetation within the project area is planted.

The dense vegetation towards the beach is home to several animal species including monkeys, lizards and snakes. Some of the fauna are shown in the figure below:

Figure 4-5: Fauna in the project area

4.1.6 Land Use

The major land uses Nyali Sub-county revolve around tourism, recreation, businesses and housing. The area is dominated by beach hotels (Voyager, Nyali beach hotel, among others), shopping malls (Nyali cinemax, Nyali Mall, etc.), residential and tourist apartments. The Nyali area of the sub-county also houses several housing estates including Shree Enclave court, Sunset Lane, among others. In addition the Kongowea area in Nyali Sub-county houses informal houses and estates.

The major land uses are shown in the figures below:

Figure 4-6: Beach Hotels along Mt. Kenya Road

Figure 4-7: Housing Estates within the Project Area

Figure 4-8: Informal Housing in Kongowea

Figure 4-9: Nyali Mall in the Project Area

4.1.7 Settlement Patterns

The project area is home to a range from high level to medium level to low level informal settlements. The settlement varies based on distance to the Indian Ocean and to Nyali Bridge. The sections towards the Indian Ocean are home to larger hotels and apartments. The area between Beach Road, Links Road and the Malindi Road are home to residential estates and apartments. Kongowea, located between Beach Road, Links Road and Nyali Road is

dominated by low income to middle income informal settlements. The Settlement is shown in the map below:

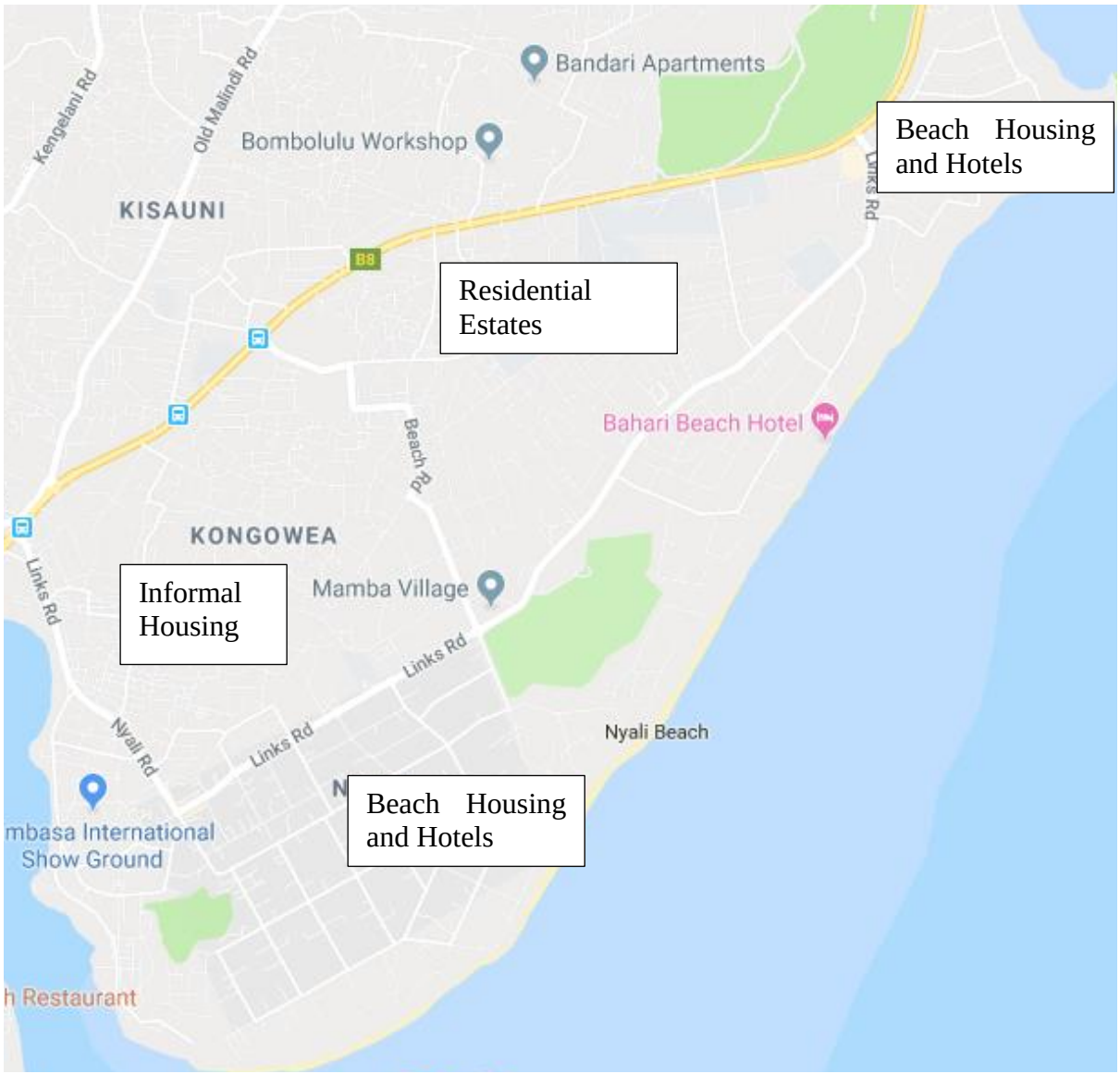


Figure 4-10: Settlement Patterns

4.1.8 Energy Sources

The entire county including Nyali Sub-county is part of the national grid provided by KPLC. However several hotels, malls, businesses and residential houses have backup generators when there are power failures, for lighting, heating and cooling.

In addition some hotels such as Bahari Beach Hotel are making efforts to improve their efficiency and generation of clean energy through the installation of solar panels for heating of shower water and to some extent lighting.

4.1.9 Ambient Noise, Air and Water Quality

Based on the existing land use in the area i.e. tourism, recreation, businesses and housing, the major sources of air noise and water pollution revolve around the following aspects:

1. Vehicular emissions from public and private vehicles these cause air,water and noise pollution.
2. Domestic waste from hotels and housing which if not treated affects ground water, which sometimes causes health outbreaks highlighted in chapter 4.3.5 of this report.
3. Solid waste mostly in form of plastics from beach goers, which makes its way into the Indian Ocean.

Figure 4-11: Beach within the Project Area Showing Debris including plastics

Based on investigations using a NEMA accredited laboratory, ESIA reports prepared in the area and site observations, the air water and noise pollution is minimal and falls within the acceptable limits especially in the areas towards the Indian Ocean which tend to be more vegetated and have less vehicular traffic. The table below provides a summary of the baseline measurements encountered within the project area:

Parameter	**Measured Parameter**	**NEMA Requirement**
1. Air		
Hydrogen Sulphide (mg/Nm^3)	12.5	50-200
Nitrogen Oxides (mg/Nm^3)	2	100-400
Hydrocarbons (ppb)	350	400-2000
2. **Noise**	75	
Decibel range (db)	30-70	Presented in table 5-2

However it is proposed that a baseline survey be conducted at the commencement of the construction works and periodically throughout the construction phase for purposes of monitoring.

4.2 SOCIO ECONOMIC INFRASTRUCTURE

4.2.1 Administration

The project area is located within the newly formed Nyali sub-county, which is similar to Nyali Constituency. The project area is located in Kongowea division within the sub-county and within Kongowea location. The sub-county is still in the process of establishing more locations.

The wards within the constituency that are covered by the proposed project include:

i. Mkomani
ii. Kongowea and
iii. Ziwa la Ng'ombe

4.2.2 Population

The population data for the project area was taken in accordance to the 2009 census and is summarized in the table below:

The current 2018 population projection was based on a population growth rate as per the Mombasa masterplan. The following table also gives the 2018 population projections for the Nyali area

Table 4-1: Population Data based on Mombasa County Masterplan

Sub County	**Area (km^2)**	**Population**	
		2009	**2018**
Nyali	22.79	185,990	286,424

4.2.3 Health

The Nyali area has limited access to public healthcare with the government owned facilities located at Ziwa la Ng'ombe and Kongowea. Kongowea is a health centre while Ziwa la Ng'ombe is a dispensary. All referral cases are taken to the Coast General Hospital.

In addition to the public health centres, the area is home to private hospitals and clinics, the most prominent being the Aga Khan located at the Nyali complex.

Being a coastal city and a hub for tourism, the prevalence of HIV/AIDS is relatively high with the National Aids Control Council reporting HIV prevalence in Mombasa is 1.2 times higher than the national prevalence at 7.5% (Kenya HIV Estimates 2015). The HIV prevalence among women in the county is higher (10.7%) than that of men (4.6%), indicating women are more vulnerable to HIV infection than men in the County.

4.2.4 Transport and Communication

Being a major City in Kenya, the area is served by a wide network of roads. In addition, Mombasa is home to the Moi International Airport which is the second largest airport in the Country. Mombasa North Mainland has an elite network with majority of the road network being to bitumen and cabbro standards. The roads in Mombasa North Mainland are currently under the jurisdiction of the County Government and the Kenya Urban Roads Authority (KURA).

The major roads in the area include Links, Beach, Mount Kenya and Moyne Roads, which are linked by several road networks. The Road network and major junctions is shown in the map below:

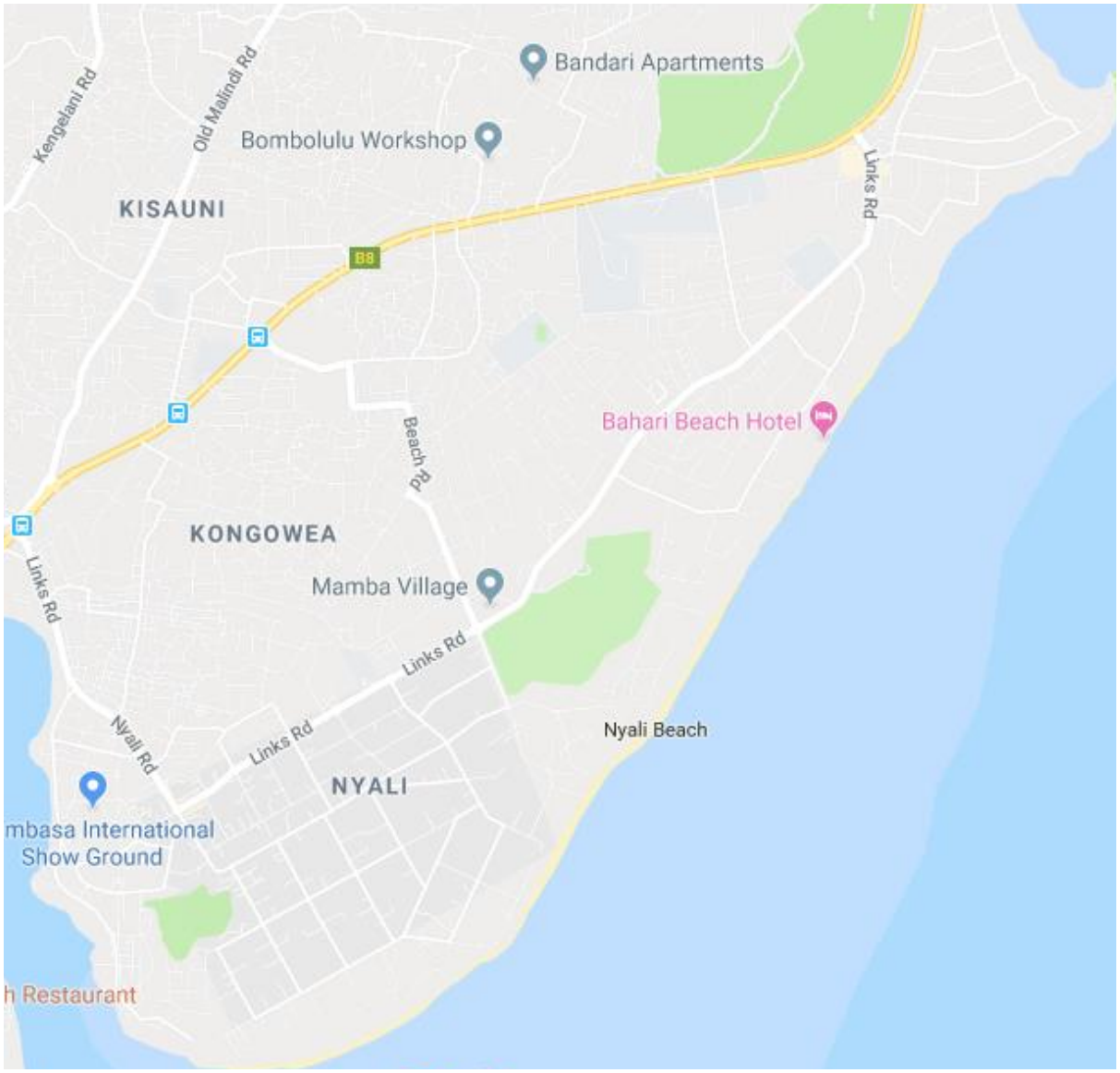


Figure 4-12: Road Networks in the Project Area

In addition the location of the pipelines with regards to the road network is shown in the map below:

Figure 4-13: Map of the Pipelines in relation to the Road Network

4.2.5 Commerce and Industry

The Mombasa North mainland is the major hub of tourism and commerce housing the majority of beach hotels in the county, due to its long and pristine coastline. As a result of the beach hotels and other tourist accommodation, several businesses have cropped up to meet the needs of these industries, including restaurants, malls, shops, taxis, watersports, clubs and gyms.

In addition to the tourism, the Indian Ocean provides a fishing ground for the local fishermen, who supply fresh fish to the beach hotels in the area.

4.2.6 Local Communities

Due to the high density of tourist facilities, Nyali area is home to a diverse array of people from all ethnical backgrounds, including Europeans, Asians, Kenyans and other Africans.

4.2.7 Water and Sanitation Services

Mombasa County receives its water from four sources namely Baricho Wellfields, Mzima Springs, Marere and Tiwi. This water supply is however inadequate to meet the demands of the proposed area. Majority of the residents have to supplement their water supply by making use of local water vendors, leading people to pay double bills for water (one to MOWASCO the other to local vendors).

It is proposed to increase the water supply via the construction of Mwache Dam. The proposed dam will meet the water demands for the whole of Mombasa including the North

Mainland. The proposed improvements on the water supply network being conducted under this project are being done in anticipation of the improved water supply.

Sanitation services in the Mombasa North Mainland are little to non-existent. The only existing public infrastructure includes pumping stations along the coastline towards the Nyali Bridge and Tamarind areas, which used to pump sewage to the treatment works in Mombasa Island. This infrastructure is however not in use. On a positive note however majority of the residents and hotels in Nyali are making great strides in waste water and solid waste management. This is done through having on site treatment in most areas (septic tanks, etc.) as well as garbage collection services and drives.

1) Water and Sewage Tariffs

The Mombasa Water and Sewerage Company (MOWASCO) is mandated to manage the water and sanitation supply in Mombasa County. MOWSCO's tariff study has applied WASREB's tariff policy for providing sustainable and affordable water supply and sanitation services to the poor to cover basic human need while at the same time ensuring financial viability of the services provided. The block tariff structure of MOWASCO incorporates the "pro-poor" policy through the provision of a lifeline tariff for poor households. This is done by charging for water and wastewater services way below the cost coverage level for the consumption of up to 6m³ per month and connection. MOWASCO's current social lifeline tariff for the poor households for the lowest consumption block 0-6 m^3 per month is only 53 percent of the weighted average tariff. This ratio, which is within the range set by WASREB, will be maintained during project implementation. MOWASCO's wastewater tariff is currently 75 percent of the water supply tariff.

4.2.8 Culture

The project area and Mombasa County area in general is a multicultural city made up of primarily the Waswahili, Arab, Mijikenda, and European among other tribes from the entire country. The area has a rich history that feeds into its culture. According to Mombasa.com, the town was a major trading centre, under the control of several parties that intermarried with Kenyan tribes to form the some of the coastal tribes. In addition the way of life in Mombasa is unique to its rich history.

4.2.9 Gender

The major issue in the County and particularly in the project area, is that women tend to drop out of school early in order to get married reading to disparity in secondary education however there are several NGOs Suggest coast women in development aim to empowering women at the grassroot level.

4.2.10 Tourism

Tourism in the Kenyan coast is the major economic activity, attracting both local and international tourists who visit the coastal for the long sandy beaches, ocean sport activities, cultural sites (the Mombasa Island in particular has several cultural sites including Fort Jesus and the Mombasa Old Town).

As such majority of the livelihood activities for the locals are to serve the tourism sector, with the residents running businesses and labour for the tourism sector.

4.2.11 Poverty

According to the Kenya National Bureau of statistics and the SOS website, poverty is a major issue particularly in the informal settlements in Kongowea. One of the reasons of the reliance on tourism for jobs. The tourist industry tends to fluctuate seasonally, affecting the incomes of some of the residents, particularly the youth, who are already vulnerable to the impacts of reduced incomes.

4.2.12 Education

Nyali sub-county has 21 secondary schools 4 of which were public and 17 private; 78 primary schools, 64 of which are private and 14 public. The area however does not have any public tertiary institutions but a few private ones. Majority of these institutions are located along the pipeline routes as such form sensitive receptors to environmental impacts.

Being an urban area, the levels of education are high, with majority of the population having achieved primary and secondary education. However there is a high dropout rate due to early marriages or lack of interest of parents to invest in education, particularly in the informal areas forcing some youth to seek casual jobs and being vulnerable to poverty.

4.3 ENVIRONMENTAL AND SOCIO-ECONOMIC SURVEY

The socio-economic situation of the area was captured based on findings of a household survey carried out using a structured questionnaire. A sample group of 100 households, distributed within the project sites was interviewed for purposes of the analysis.

4.3.1 Population dynamics and household characteristics

The average household size is 4 people. The general trend shows that most of the people fall in the 19-35 and 5-18 age groups, showing that the area is predominantly made up of young families. Figure 4.1 shows the population age brackets.

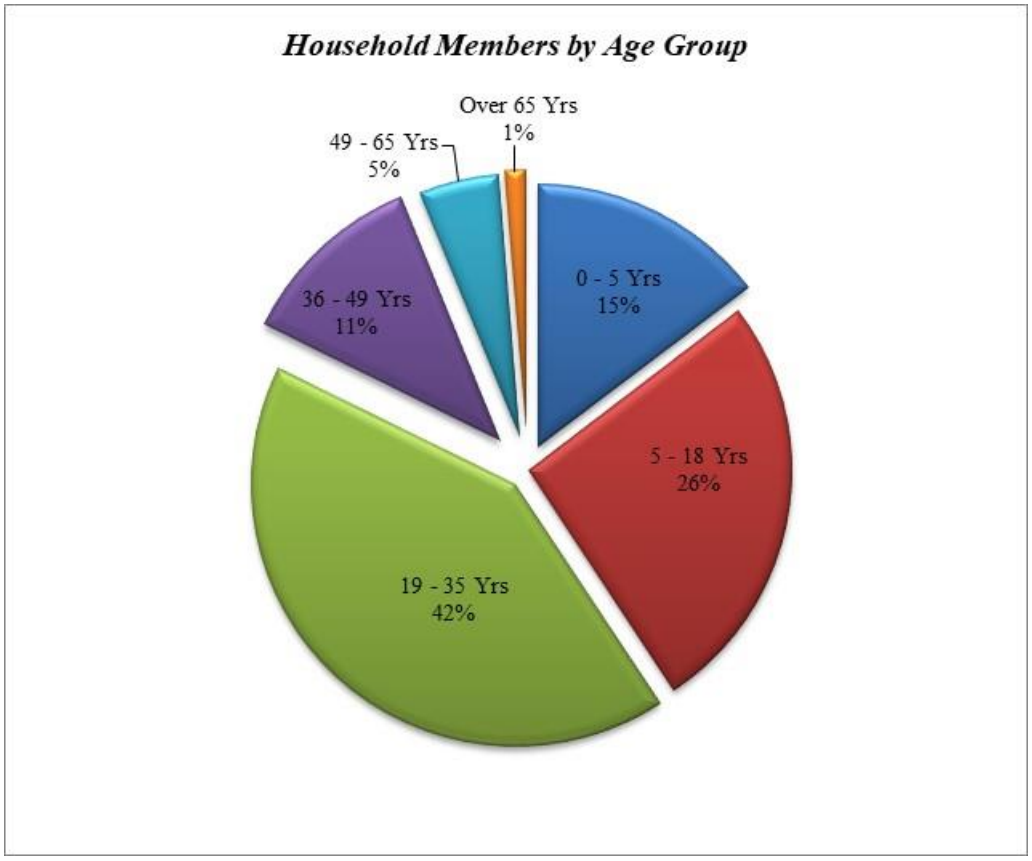


Figure 4-14: Age Distribution of the Population

Source: Survey data.

Literacy levels were as follows:- Primary level 32%, Secondary level 38%, college /university 19% and no education at all 11%. Therefore the areas have a high literacy level, which is common in urban settings.

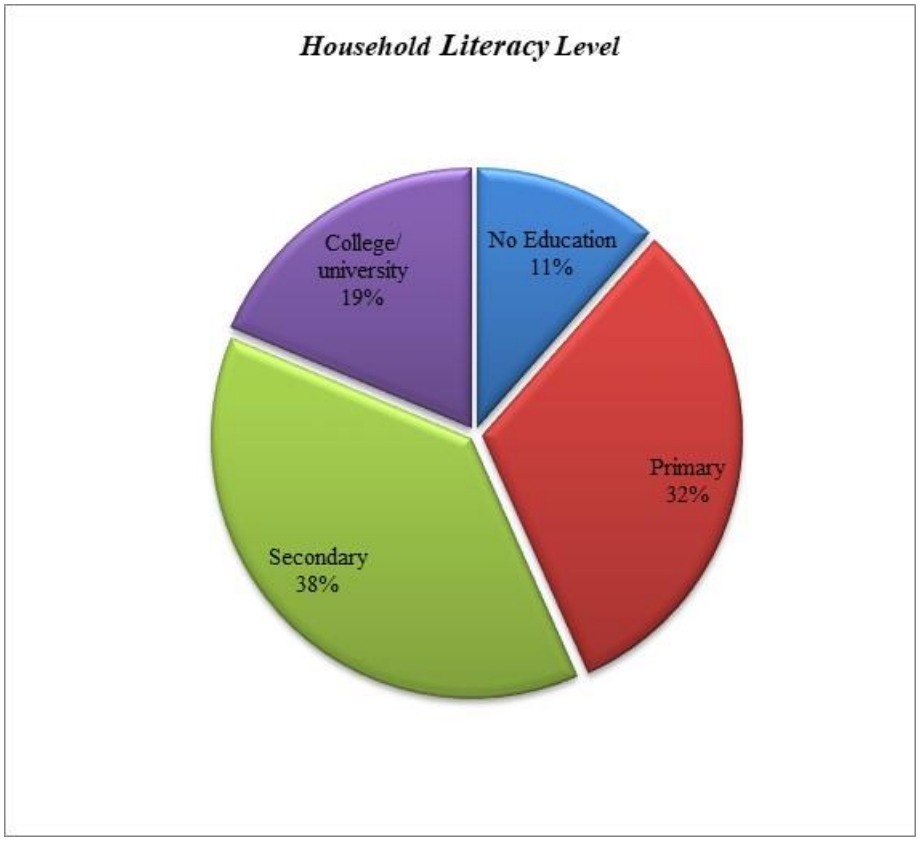


Figure 4-15: Household Literacy Level

Source: Survey data.

Christianity is the predominant religion in the area followed by Muslim with 83% and 17% population professing the faiths respectively.

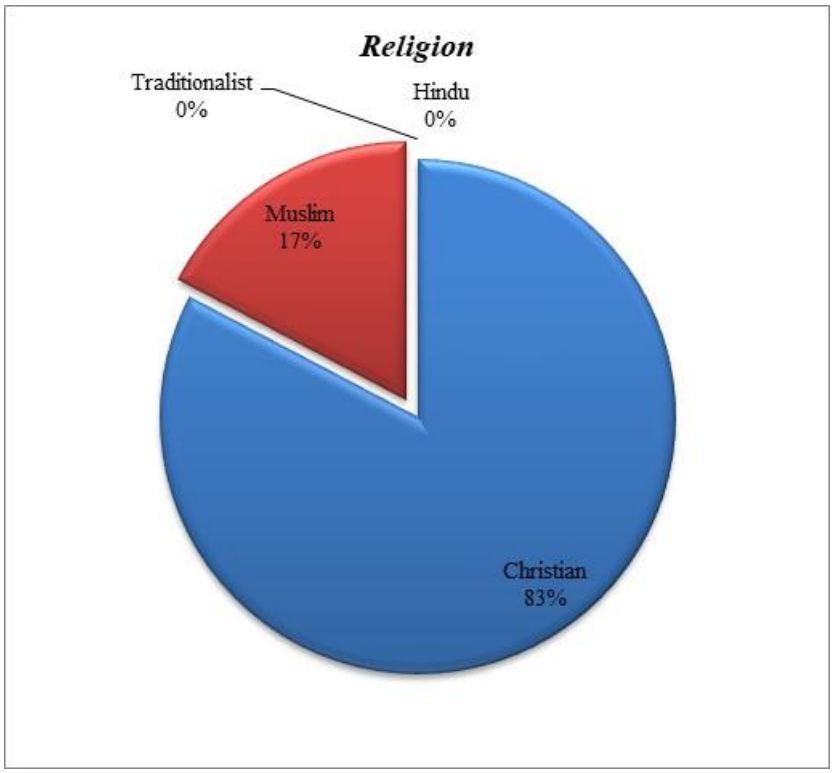


Figure 4-16: Religion of the Population

Source: Survey data.

Charcoal is the main source of energy used by the community with 50% of the population depending on it. Other fuel sources are Kerosene, LPG gas, electricity and firewood.

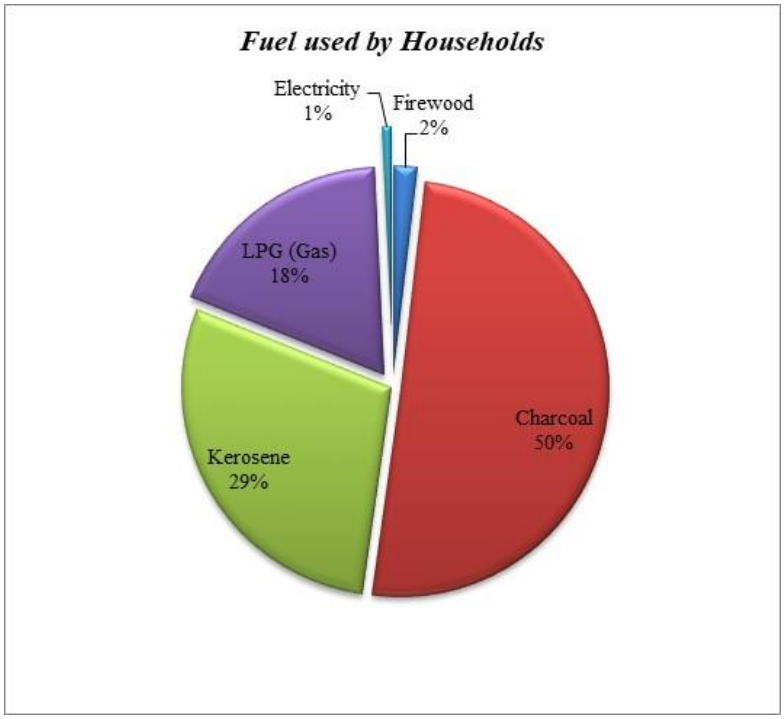


Figure 4-17: Sources of Energy

Source: Survey data.

Being that the project area is an urban area business and formal employment are the main socio-economic activities with 75.6% and 21% respectively. The other socio-economic activities are shown below:

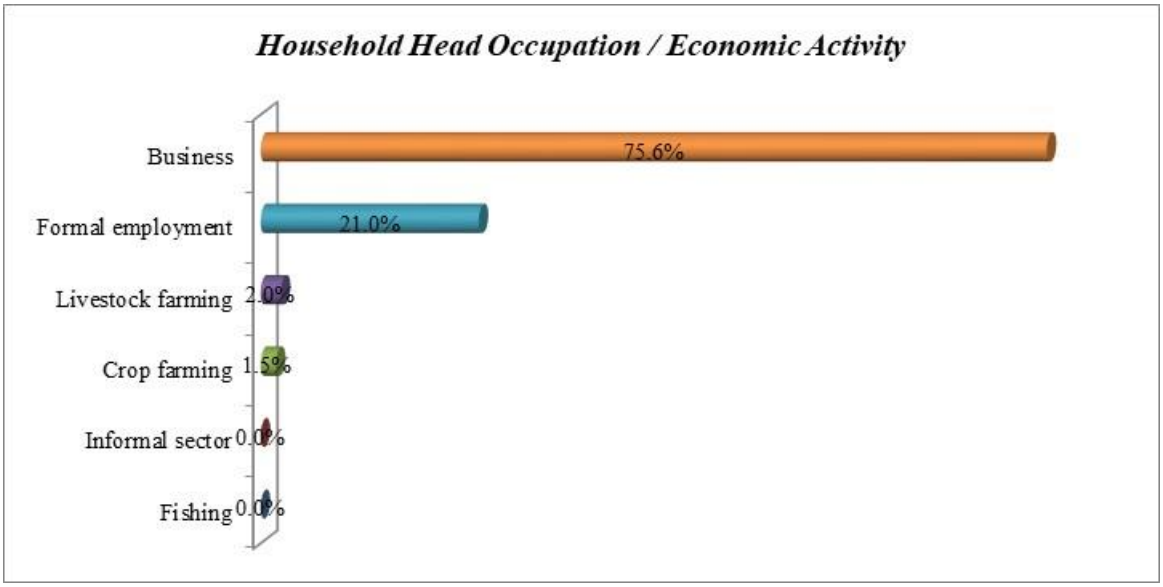


Figure 4-18: Household Socio-Economic Activities

Source: Survey data.

The household conducting business constitutes 75.6% of the total population. The most popular business in the area is the Jua Kali industry comprising of 60 % of the entreprising population. 12% of the entreprising population have shops while 11% sell groceries. Other businesses are shown in the figure below.

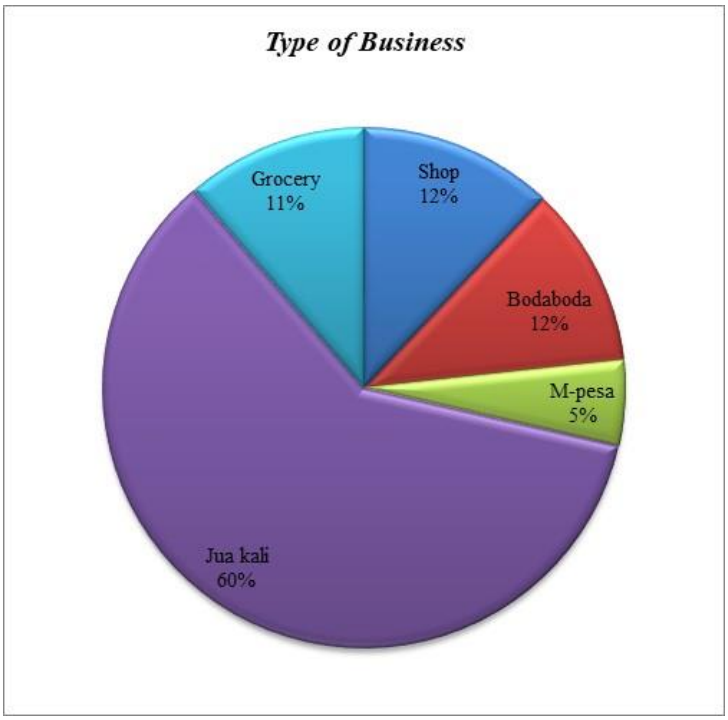


Figure 4-19: Business types in the project area

Most of the populations' income lies under 15000. However the area is populated by the high and middle class in Nyali as well as low income earners in Kongowea.

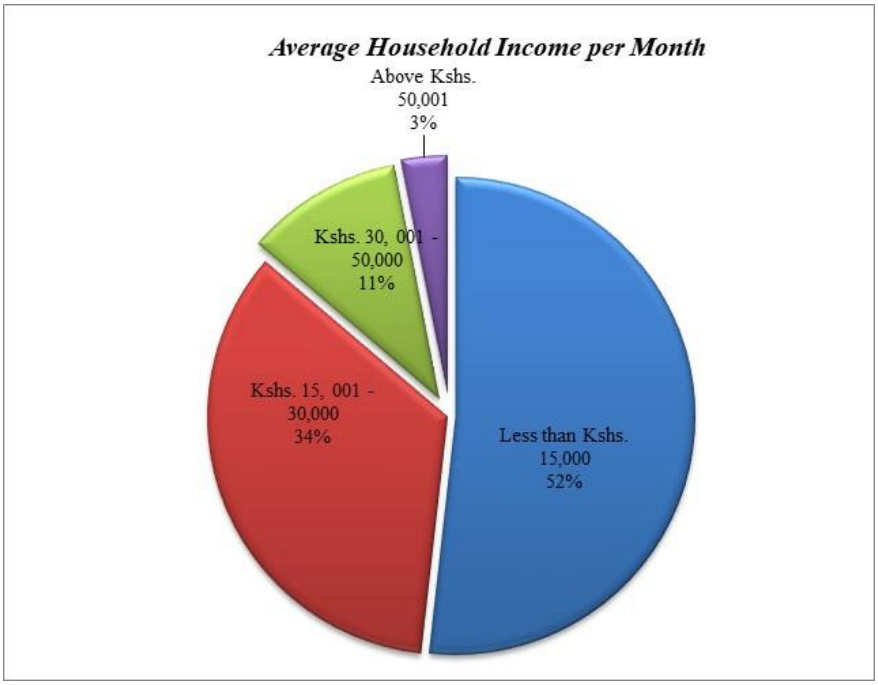


Figure 4-20: Household Income per Month

Source: Survey data.

4.3.2 Water Supply

Being an urban area, the project areas receive piped water either through water vendors, private taps provided by MOWASCO and boreholes as shown below.

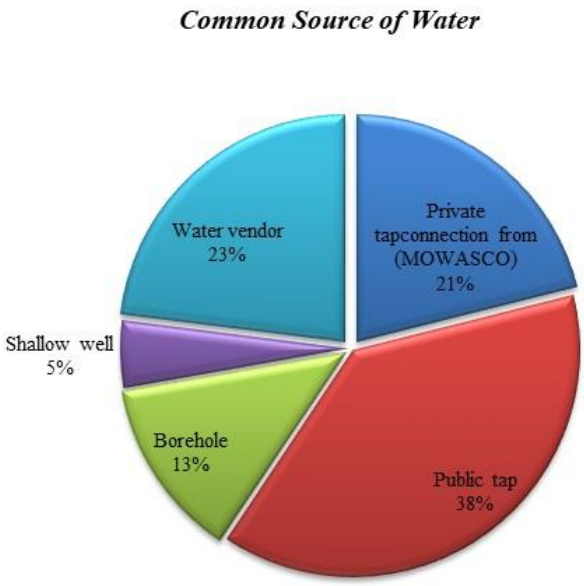


Figure 4-21: Main Sources of Water for the Community

Source: Survey data.

Majority of the population pays for water with 97% of the population paying for water, with the population paying both a monthly bill to MOWASCO as well as often paying local vendors for jerrycans of water. The rates for water are shown in Figure 4-23 and Figure 4-24 below:

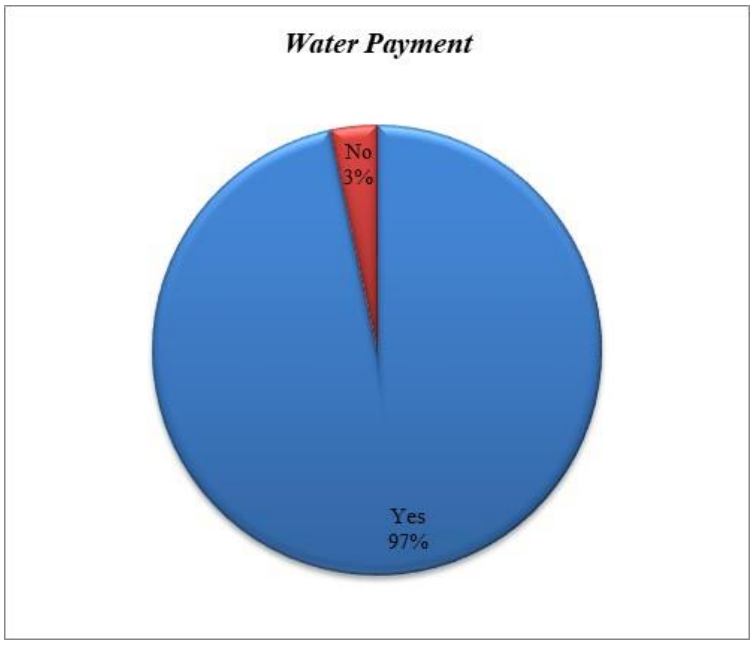


Figure 4-22: Percentage Population Paying for Water

Source: Survey data.

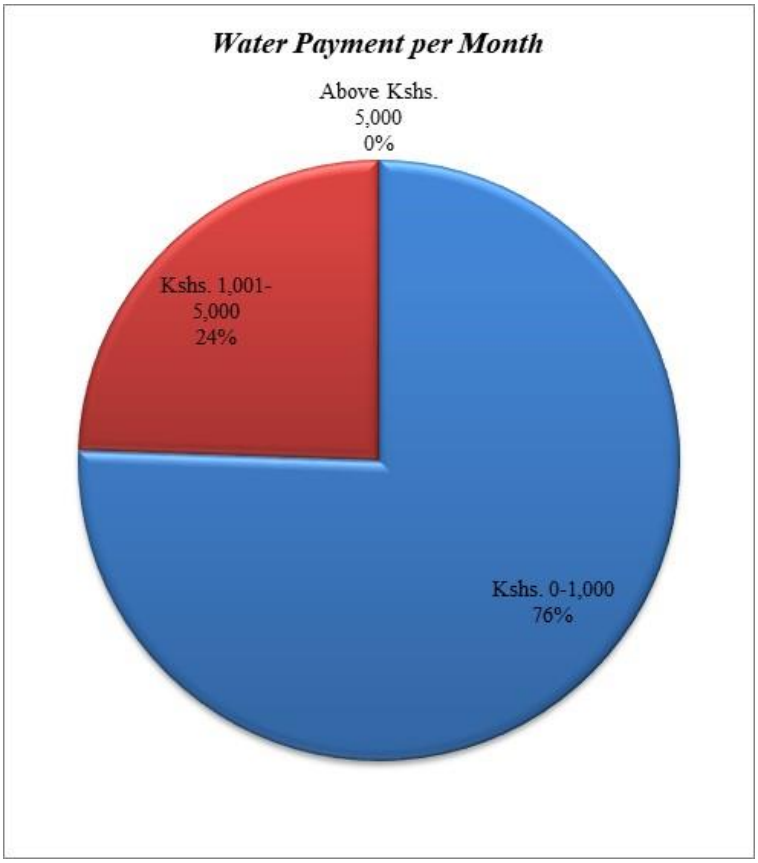


Figure 4-23: Monthly bills paid to MOWASCO

Source: Survey Data

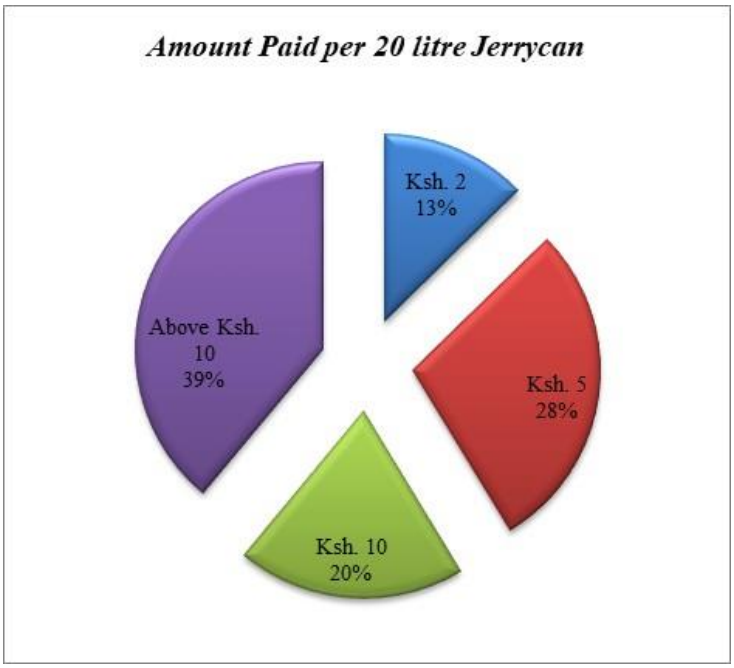


Figure 4-24: Amount paid per 20 litre jerry can

Source: Survey Data

The water quality is generally fair with 57% of the respondents indicating that the water quality is acceptable. 24% of the respondents find the water to be good while 19% find it to be bad.

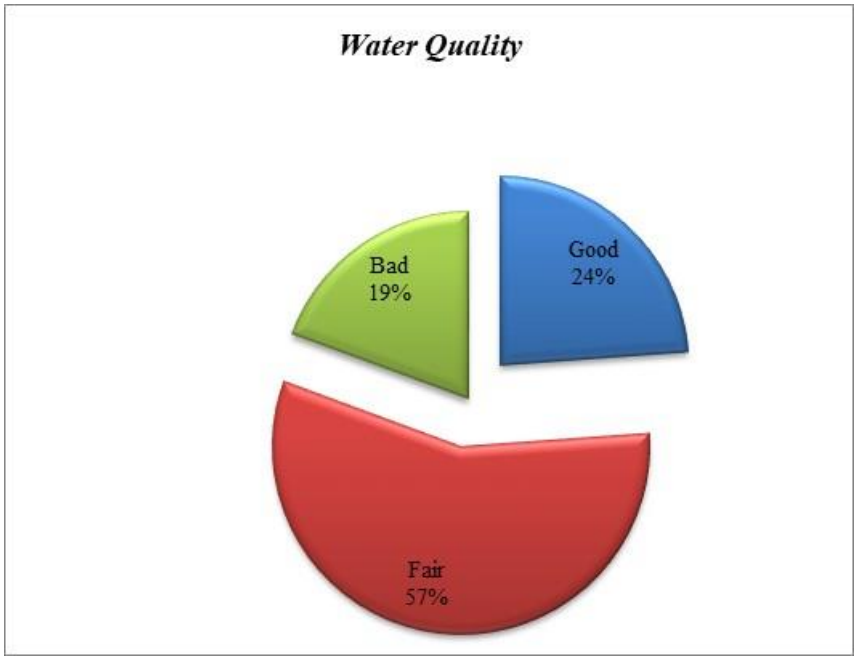


Figure 4-25: General Status of the Water Quality

Source: Survey data.

The major issue experienced in the Nyali area is inadequacy of water, with a whopping 77% of the respondents stating that the water supply is not adequate as shown in the figure below:

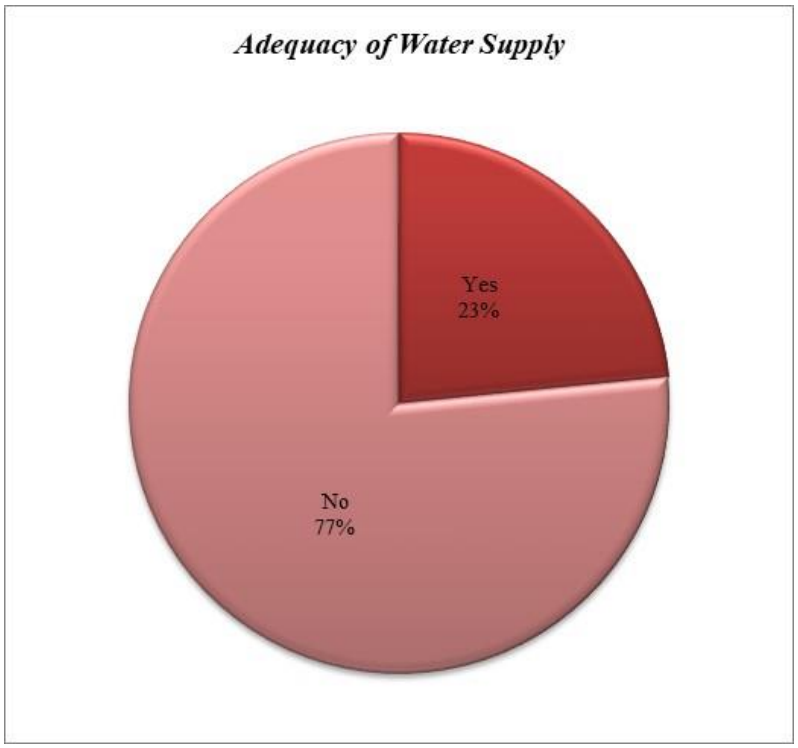


Figure 4-26: Adequacy of Water Supply

Source: Survey Data

In addition the frequency of receiving water is mostly irregular as shown in the statistics below:

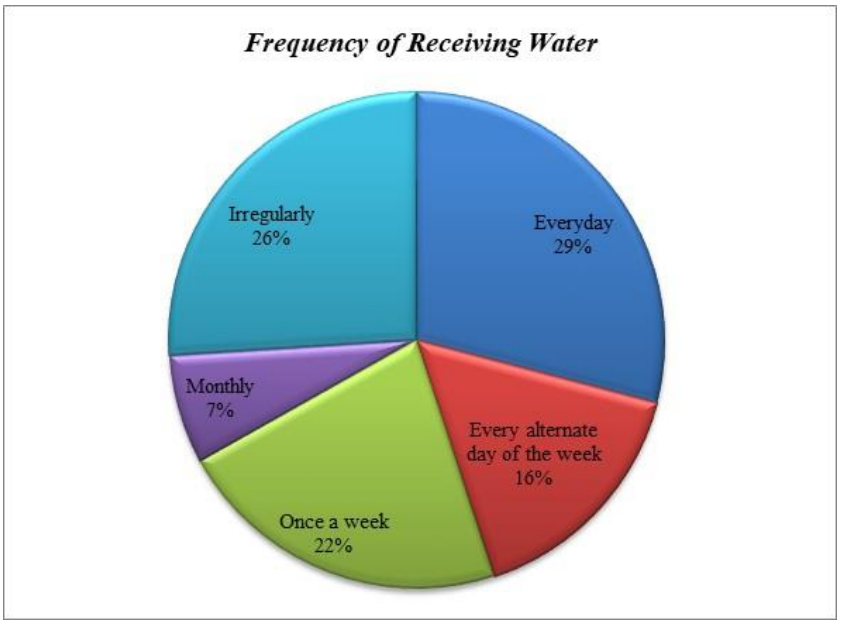


Figure 4-27: Frequency of receiving water

Source: Survey Data

Further solidifying the fact that the major issue that people have in the area with regards to water supply is the irregularity of the supply among others as shown in the figure below:

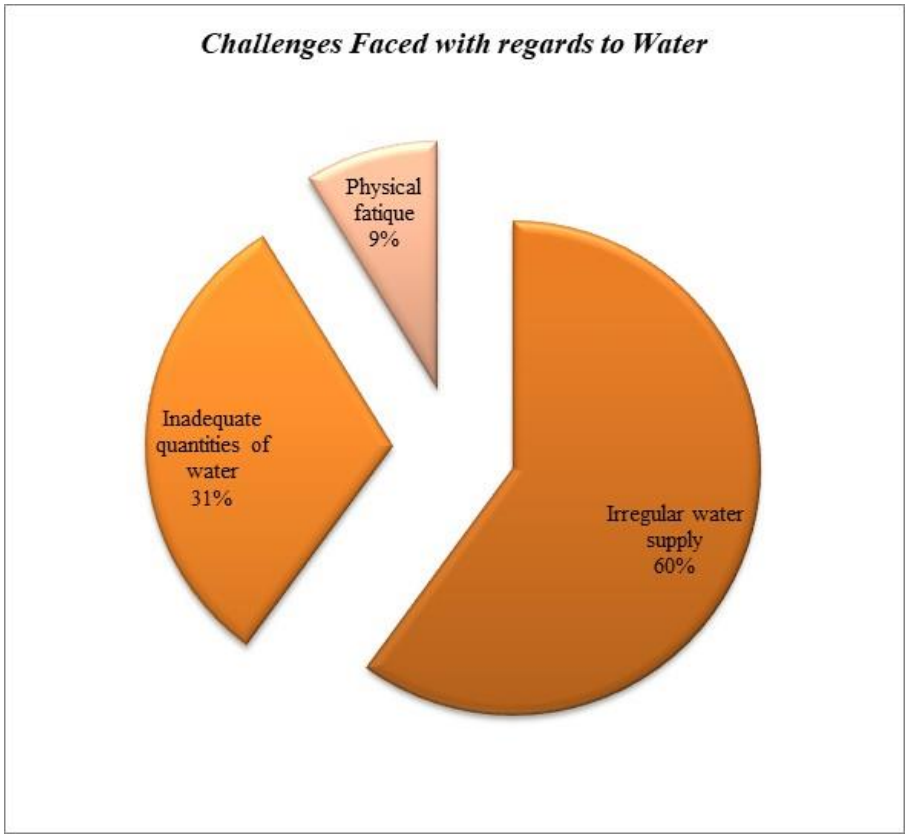


Figure 4-28: Challenges faced with regards to Water

Source: Survey Data

4.3.3 Sanitation

The methods used by the population to dispose refuse are distributed as follows: 33% rely on private collectors, 33% burn their waste, 15% dump in open areas, 11% on collection by the county and 8% bury their waste the chart below shows the waste disposal figuratively.

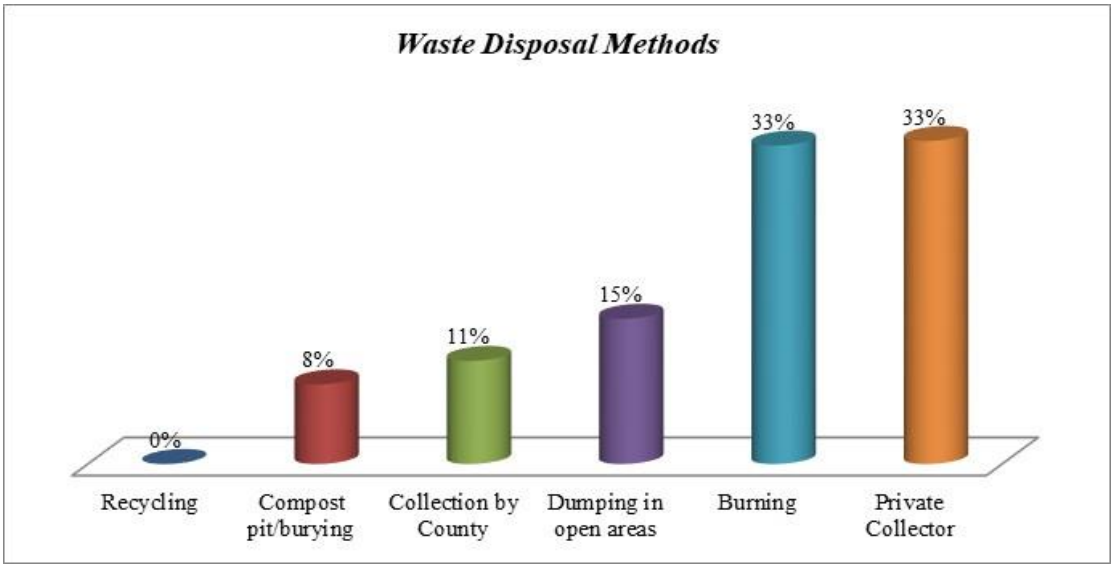


Figure 4-29: Common Waste Disposal Methods

Source: Survey data.

All of the households interviewed have access to a toilet, however due to extremely old or nonexistent sewerage in the area, many of the residents make use of pit latrines in the low income areas and flush toilets connected to septic tanks and to a sewerage network as shown in the figures below:

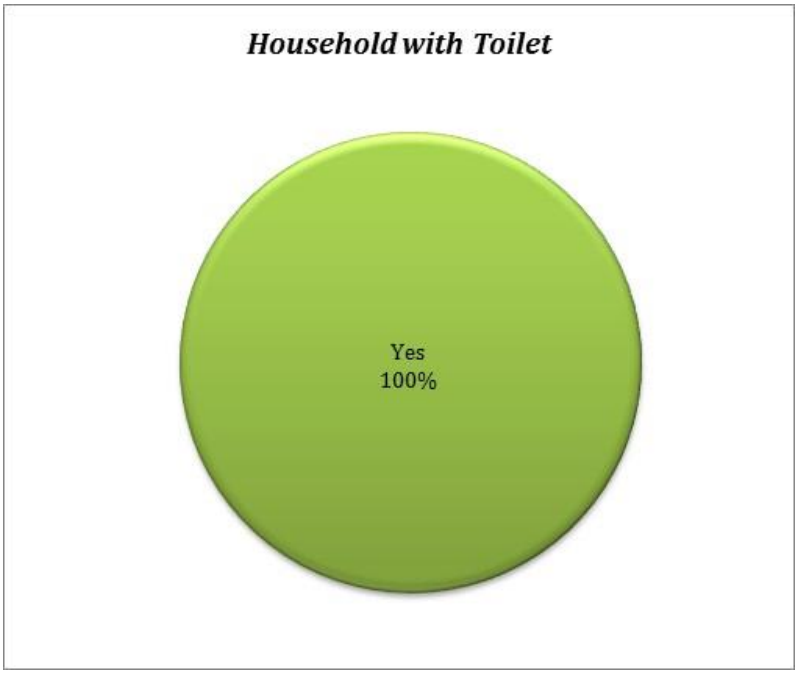


Figure 4-30: Respondents Who Have Toilets in Their Compound

Source: Survey data.

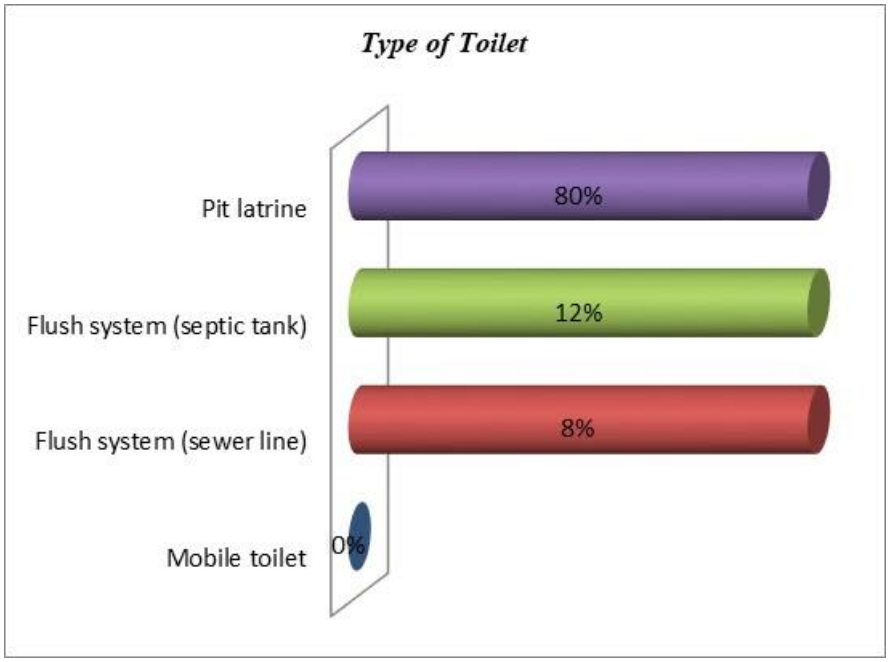


Figure 4-31: Types of Toilets Respondents Have in Their Compound

Source: Survey data.

4.3.4 Environmental Situation

The environmental concerns in the area include water shortage, mosquitos and malaria spread, solid wastes generation, poor sanitation, encroachment into road reserves among others as shown in the figure below.

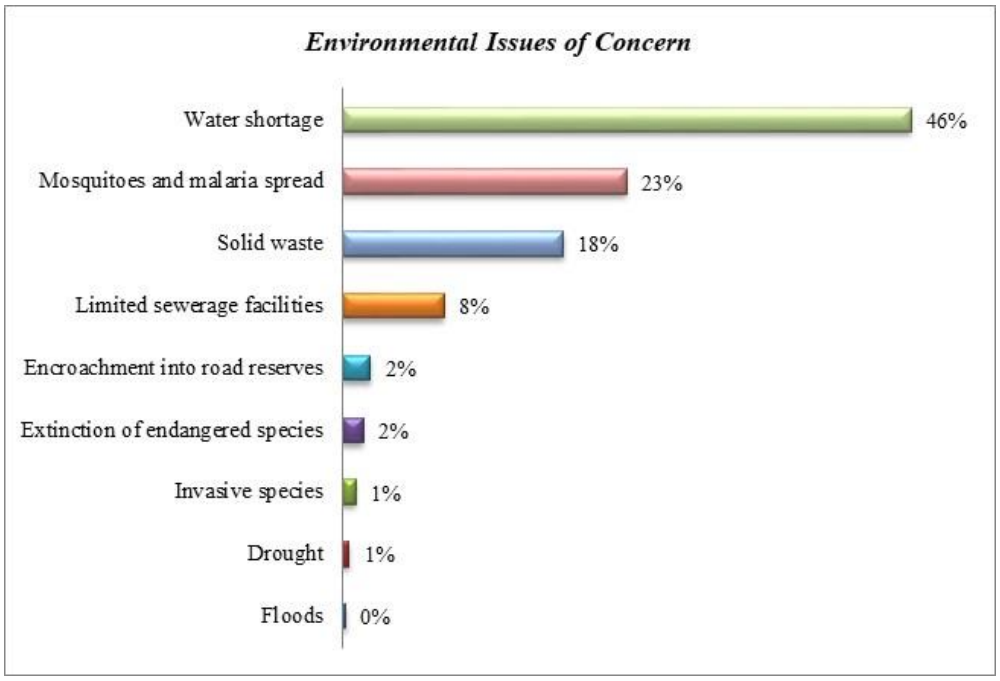


Figure 4-32: Environmental Issues of Concern

Source: Survey data.

There are a number of environmental conservation initiatives in the area such as educating the public on environmental conservation and clearing of mosquito breeding sites and others such and collection of solid wastes.

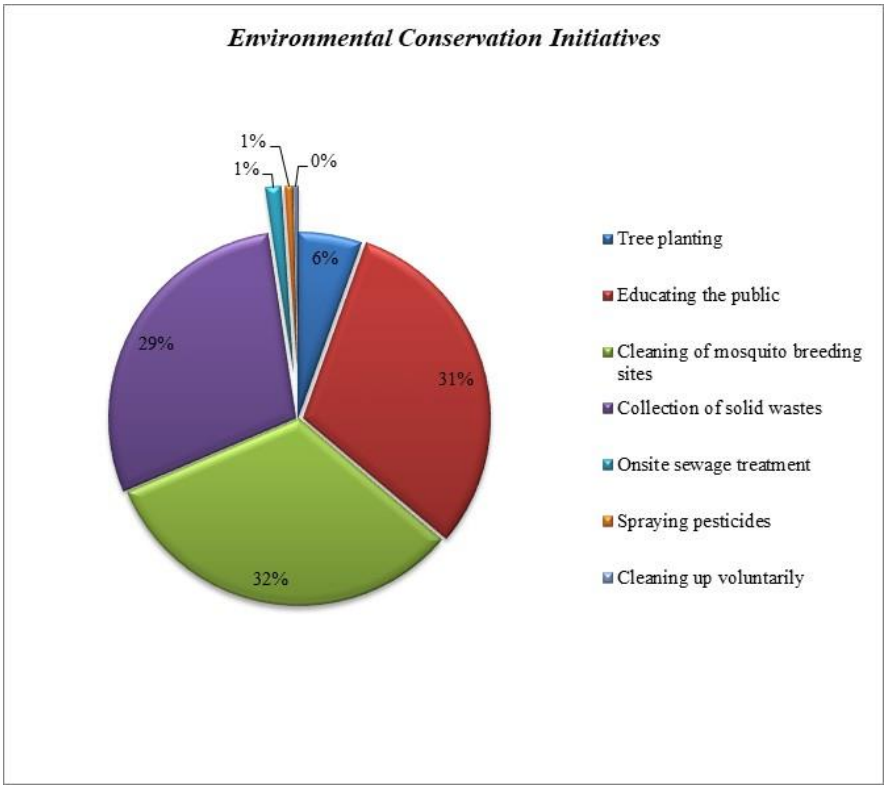


Figure 4-33: Environmental Conservation Initiatives

Source: Survey data.

These activities are carried out by the county government, individuals, youth groups, women groups, NGOs, CBOs as indicated in the figure below.

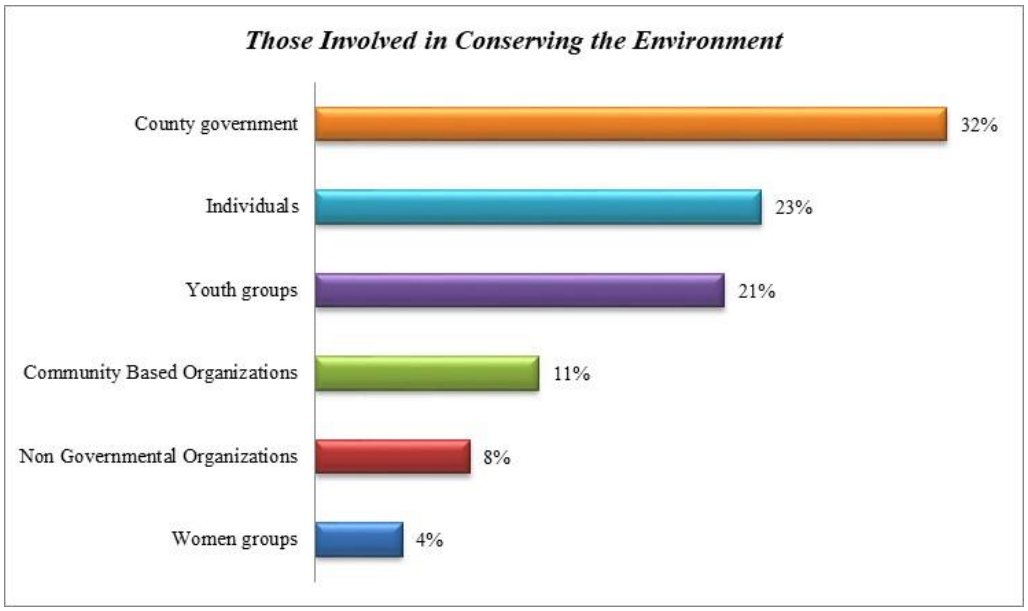


Figure 4-34: Implementers of Environmental Conservation Initiative

Source: Survey data.

85% of the population feel that the project will help conserve the environment due to the reduced raw sewage making its way to the Indian Ocean, while only 15% feel that it will not.

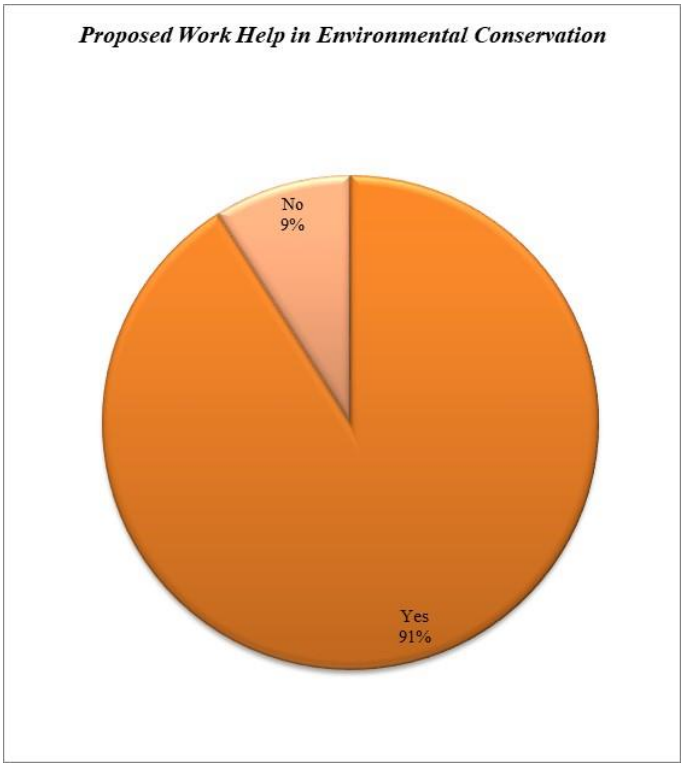


Figure 4-35: Will the Water Supply Project help in conserving the Environment

Source: Survey data.

4.3.5 Health Status

The prevalent diseases in the area are malaria, diarrhea, skin rashes cholera and respiratory infections most of which are water based. In addition there are has recently been an outbreak of Chikungunya (a dengue fever like disease) in the area, which could also be related to water shortage.

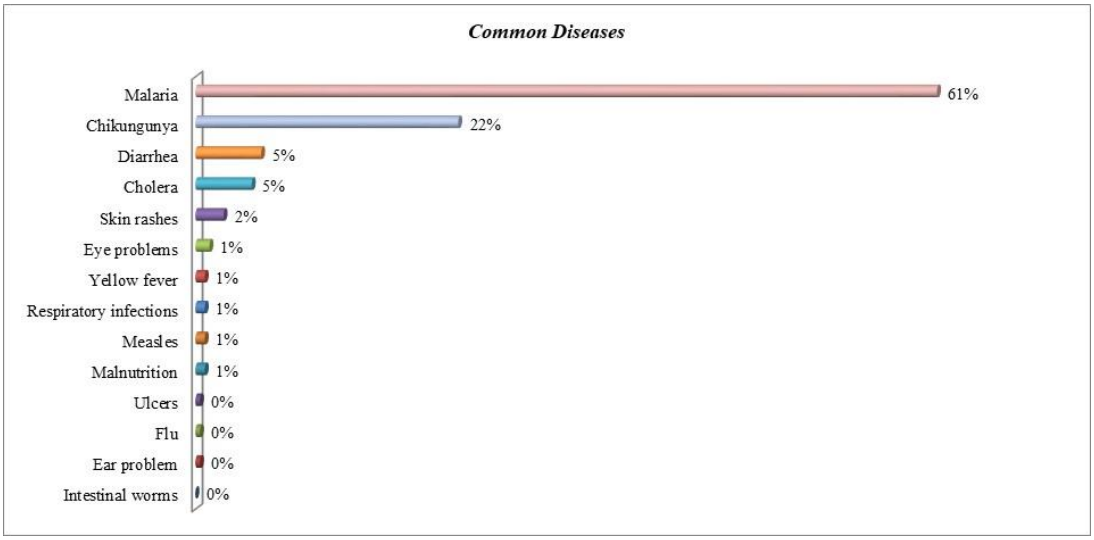


Figure 4-36: Prevalence of Diseases in the Area

Source: Survey data.

Most of the respondents when sick seek medical attention from a health centre.

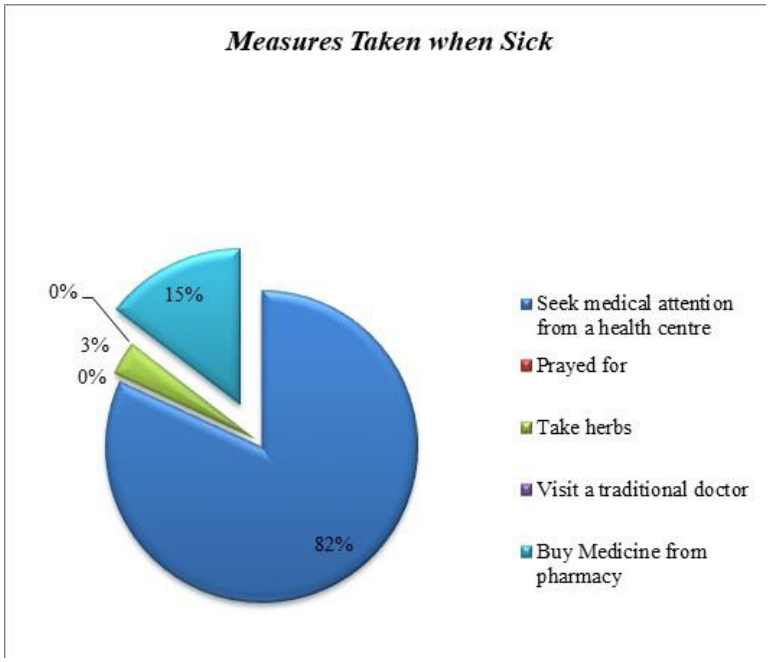


Figure 4-37: Type of Treatment

Source: Survey data.

The health facilities sought by the local population are mainly public and privately owned health facilities.

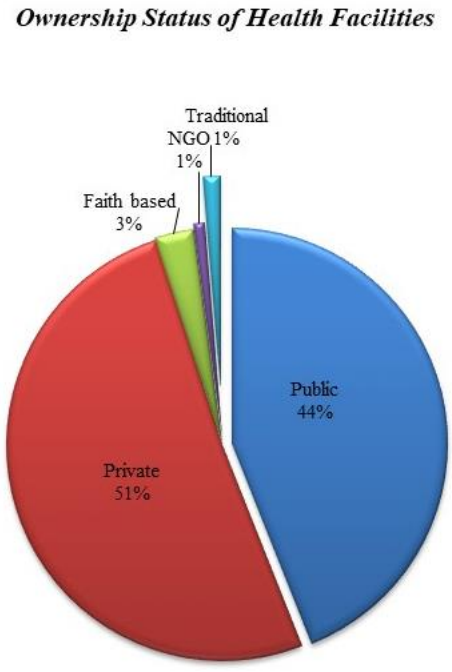


Figure 4-38: Ownership Status of the Health Facilities.

Source: Survey data.

Being an urban centre, the health centres are located nearby with majority located less than 5Km away as shown in the figure below.

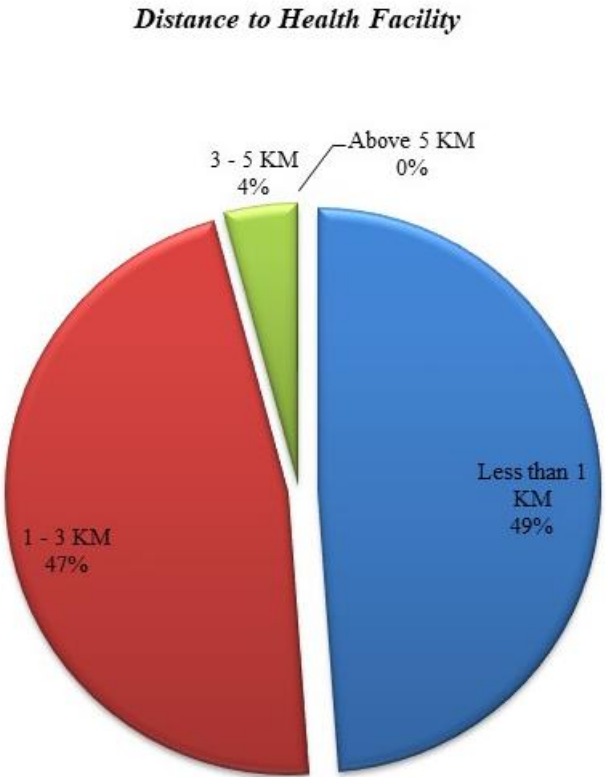


Figure 4-39: Distance to the Health Facilities.

Source: Survey data.

The level of HIV/AIDS awareness is high. 100% of the population is aware of HIV/AIDS.

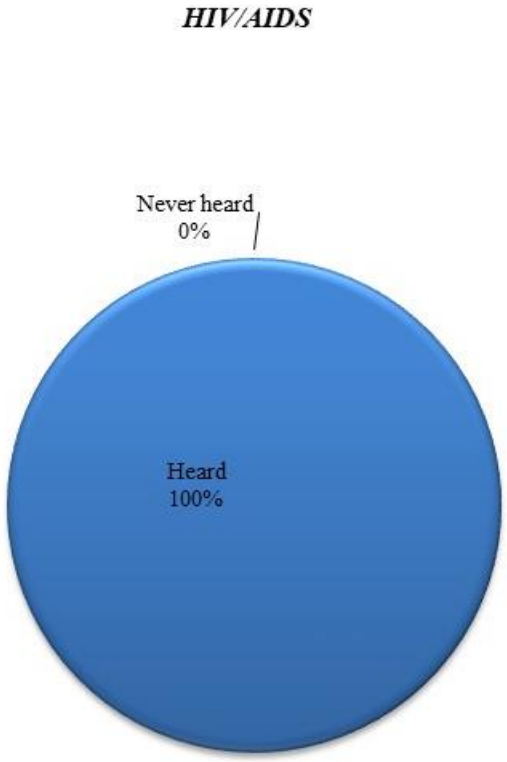


Figure 4-40: Level of Awareness on HIV/AIDS

Source: Survey data.

Information about HIV/AIDS is mainly got from the media, family members and friends, health workers, religious leaders, and NGOs/CBOs.

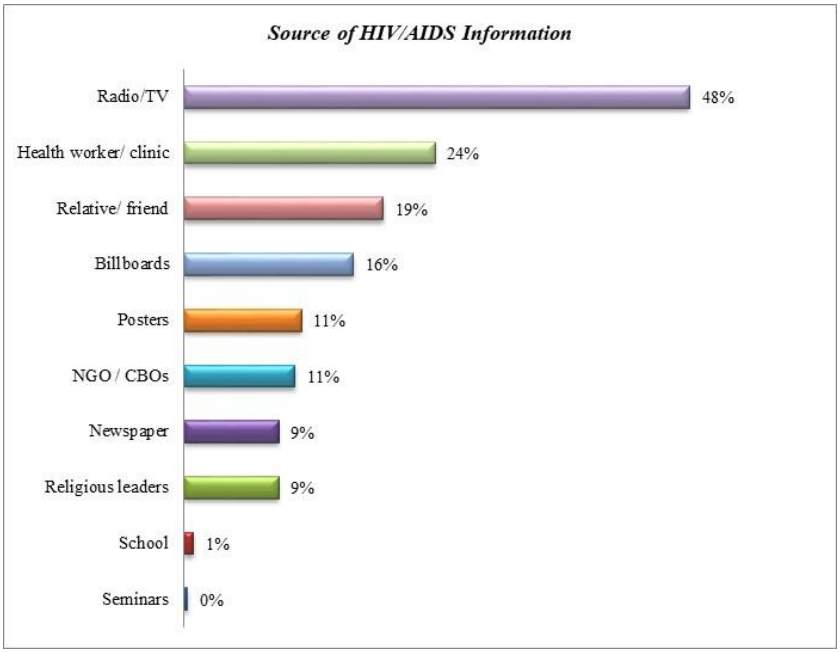


Figure 4-41: Source of information on HIV/AIDS

Source: Survey data.

92% of the respondents have been affected by the disease, in comparison to the county level in comparison to the 3% within the county. The higher rate within the project areas may be due to the fact that the area is highly influenced by the tourism in the area. The affected population is treated as a vulnerable group due to the stigmatization of the scourge, and can be assisted by provision of ARVs during the project duration.

Figure 4-42: Household Members affected by HIV/AIDS

Source: Survey data.

99% of the respondents feel that HIV/AIDS can be prevented while a small fraction of the population 1% says it cannot be prevented.

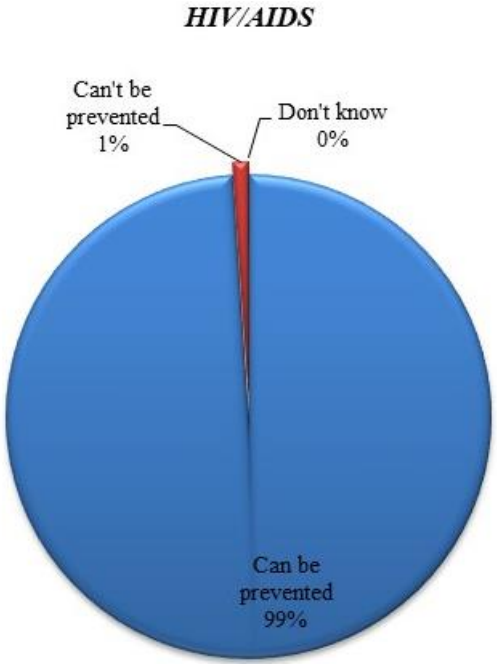


Figure 4-43: Knowledge on whether HIV/AIDS can be prevented

Source: Survey data.

98% of the respondents know where to go for voluntary counselling and testing for HIV/AIDS, which reflects positively on the awareness of HIV/AIDS and its repercussions.

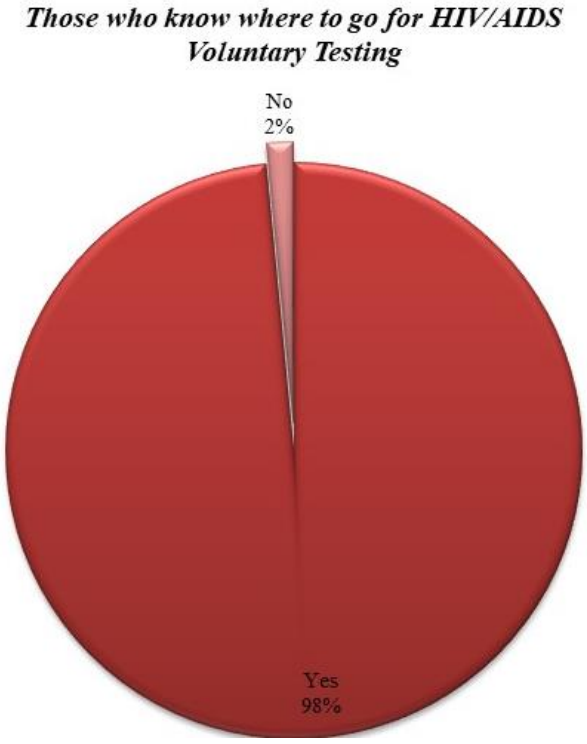


Figure 4-44: Respondents who know where to go to for Voluntary HIV/AIDS Testing

Source: Survey data.

4.3.6 The Project

Most of the residents are aware of the proposed project as shown in the figure below

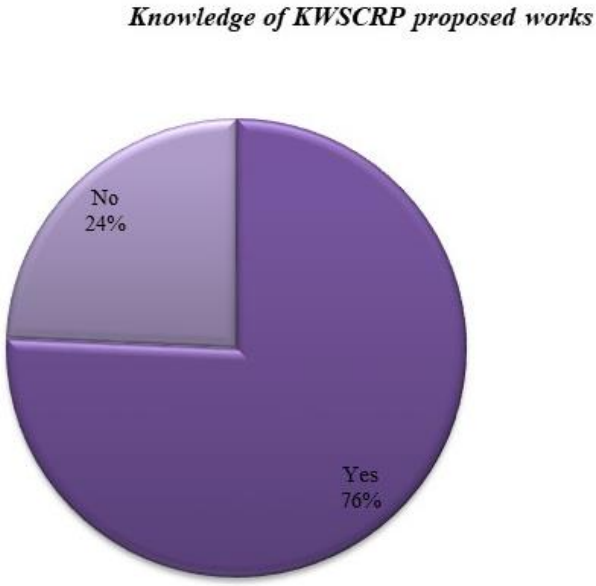


Figure 4-45: Public Awareness of the Intended Construction of the Pipeline

Source: Survey data.

62% of the respondents perceived that the construction of the pipelines will bring positive impacts while 38% percent perceived that it will bring about adverse impacts.

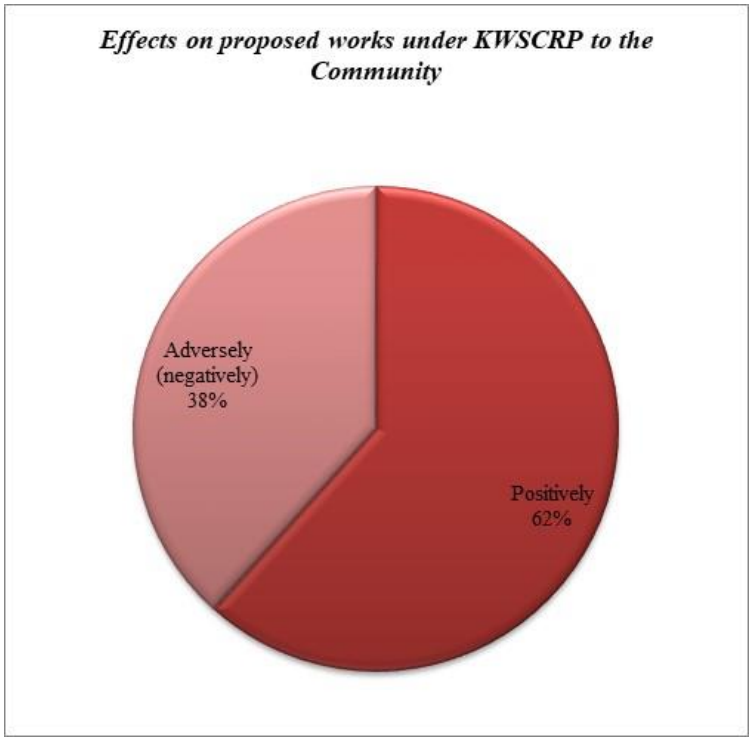


Figure 4-46: Perceived Impact of the Water Supply Project

Source: Survey data.

The positive impacts expected include reduced time and cost in searching for water, growth of the area with increased water supply among others as shown below.

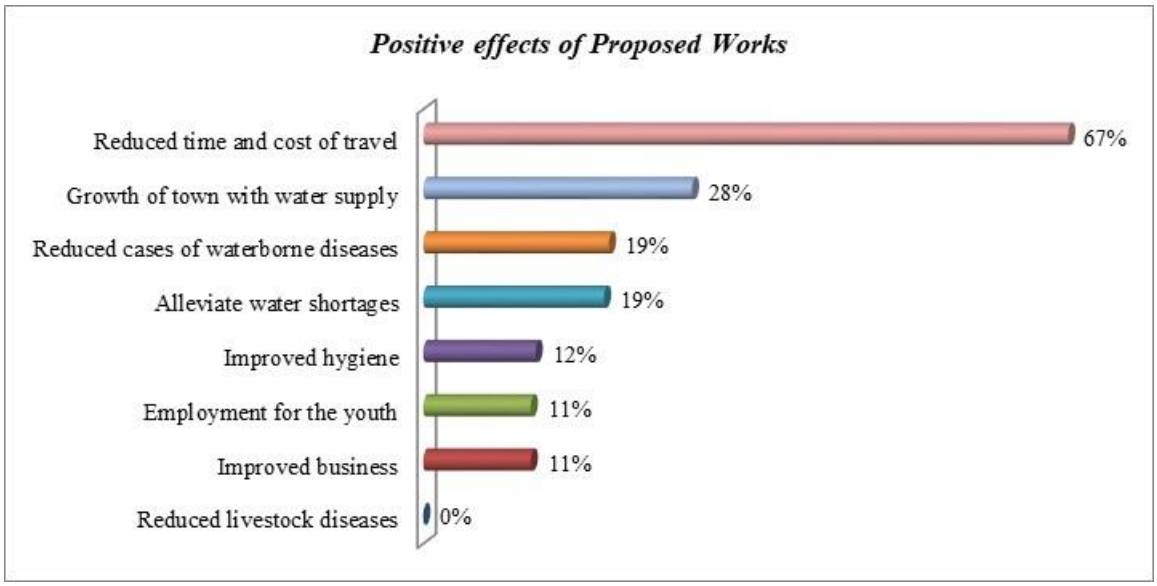


Figure 4-47: Positive Impact of the Proposed Project

Source: Survey data.

The negative impacts expected include demolition of structures and dust, noise generation, interruption of services, soil erosion, loss of vegetation as shown in the figures below during construction.

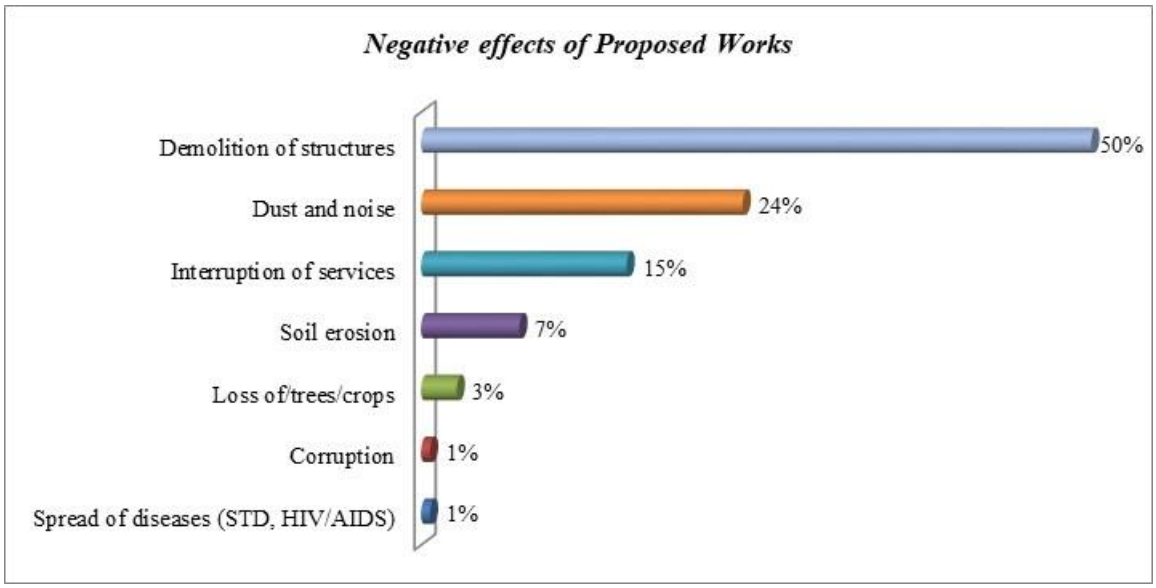


Figure 4-48: Negative Impact of the Proposed Project

Source: Survey data.

To mitigate the negative impacts the respondents feel that there is need to inform the public on any interruption of services, need to educate the public and the construction crew on health and safety, compensate the structure/land/crops/tree owners and avoid night time construction.

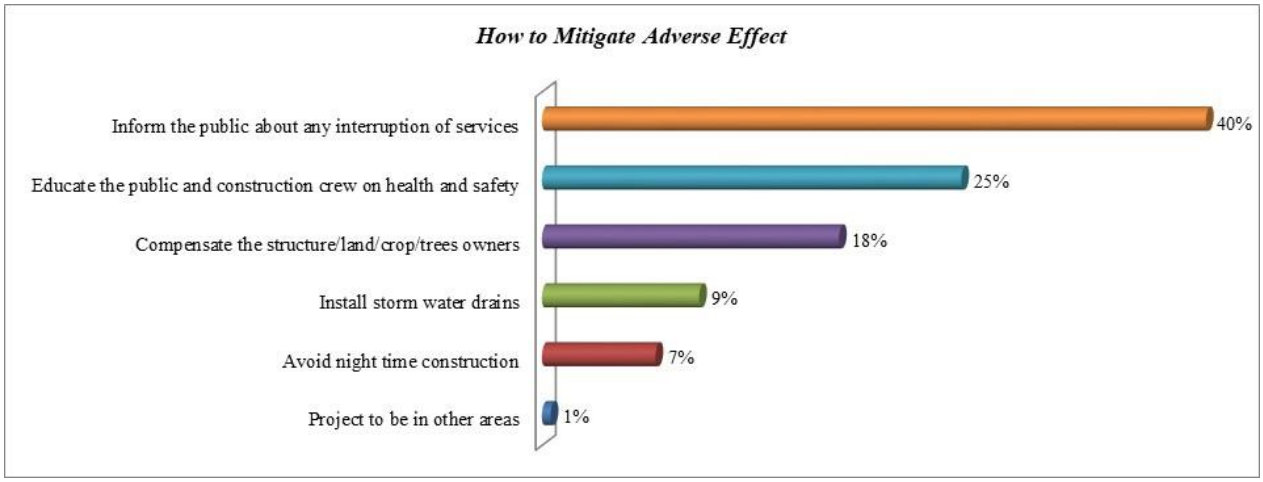


Figure 4-49: How to Mitigate Adverse Impact of the Project

Source: Survey data.

5 RELEVANT LEGISLATIVE/ REGULATORY FRAMEWORK

There are many laws and regulations governing issues of environmental concern in Kenya. The principal National legislation is the Environmental Management & Coordination (Amended) Act of 2015. The Act empowers stakeholders to participate in sustainable management of the natural resources. It calls for Environmental and Social Impact assessment (ESIA) to guide the implementation of environmentally sound decisions. Other local laws and regulations looked into include but are not limited to, the Constitution, the Water Act of 2016 among others.

In addition to the local legislation, the Consultant has identified some World Bank Policies of relevance to the project.

The following is an outline of the legislative, policy and regulatory framework for which the Proponent shall observe and implement in an effort to comply with Environmental Sustainability.

5.1 THE CONSTITUTION OF KENYA 2010

Article 42 states that every person has the right to a clean and healthy environment. The constitution provides guidance on steps that may be taken in case any of any infringement on these rights. In addition, the constitution provides for the establishment systems for carrying out environmental impact assessment, environmental audit and monitoring of the environment.

In addition to the protection of the environment, the constitution states that the land in Kenya belongs to the people of Kenya collectively as a nation. The constitution classifies the land in Kenya into different categories. These categories will dictate whether compensation will be required for the acquisition of a way leave. The categories include: public (including all roads and thoroughfares).

5.2 NATIONAL GENDER AND DEVELOPMENT POLICY

The National Gender and Development Policy provide a framework for advancement of women and an approach that would lead to greater efficiency in resource allocation and utilisation to ensure empowerment of women.

The National Policy on Gender and Development is consistent with the Government's efforts of spurring economic growth and thereby reducing poverty and unemployment, by considering the needs and aspirations of all Kenyan men, women, boys and girls across economic, social and cultural lines. The policy is also consistent with the Government's commitment to implementing the National Plan of Action based on the Beijing Platform for Action (PFA).

The overall objective of the Gender and Development Policy is to facilitate the mainstreaming of the needs and concerns of men and women in all areas in the development process in the country. This law will be of relevance to the contractor in ensuring that all genders are given an equal opportunity during recruitment during the construction phase and operation phase of the project. The employers will also provide adequate facilities for all genders within the project site.

5.3 THE ENVIRONMENTAL MANAGEMENT AND COORDINATION (AMENDED) ACT OF 2015 (CAP 387)

This Act is an amendment of the Environmental Management and Co-ordination Act of 1999. The amended Act covers virtually all diverse environmental issues which require a holistic and coordinated approach towards its protection and preservation for the present generation without compromising the interests of the future generation to enjoy the same. Consequently, the amended act provides for the legal regime to regulate, manage, protect and conserve biological diversity resources and access to genetic resources, wetlands, forests, marine and freshwater resources and the ozone layer to name a few.

The Environmental Management and Coordination (Amended) Act, 2015 harmonizes the various requirements of the other existing laws and regulations by stipulating that where the provisions of any existing law conflicts with itself, then the provisions of the Environmental Management and Coordination (Amended) Act, 2015 shall prevail. This way, the act is able to minimize any conflicts in enforcement of the various environmental laws and regulations as applied to the relevant sectors. The Environmental Management and Coordination (Amended) Act, 2015 represents the culmination of a series of initiatives and activities coordinated by Government and stakeholders. It accentuates the right of every person in Kenya to live in a clean and healthy environment and obliges each and every one to safeguard and enhance the environment. It is the master plan for the environment in Kenya and contains a National Environment Policy, Framework Environmental Legislation and Environmental Strategy.

The Act gives power to the National Environment Management Authority (NEMA) which is a semi-autonomous government agency mandated to exercise general supervision and coordination over all matters relating to the environment and to be the principal instrument of the Government of Kenya in the implementation of all policies relating to the environment. NEMA is the body in charge of ensuring developments adhere to the policies and frameworks set out by the Authority.

The amended act highlights the need for an ESIA which is presented in this report.

5.4 THE ENVIRONMENT MANAGEMENT AND COORDINATION AMENDED ACT 2015 AND ITS TOOLS

The Act has several regulations that aid in its implementation the relevant regulations are highlighted in the sections below:

5.4.1 Environmental (Impact Assessment and Audit) Regulations 2003

These Regulations stipulate the importance of conducting an ESIA as well as the procedure necessary. The Regulations highlight the various reports and their contents to be submitted to NEMA for licensing. The regulations highlight the ESIA process which includes:

- Submission of a ESIA project report to NEMA for review or licensing
- In some cases the Authority will request for a full study report for some projects for which the applicant will be required to prepare a Terms of Reference and submit a study report.

The project and study reports will be conducted before the implementation of the development in question, the reports will be subject to approval by NEMA, the 0.1% fee requirement however has been scrapped via government notice.

The regulations also calls for Environmental auditing and monitoring that will be carried out during the construction or operation of the enterprise, the regulations provide the format of the audit report which will be provided to NEMA.

5.4.2 Water Quality Regulations (2006)

Water Quality Regulations apply to water used for domestic, industrial, agricultural, and recreational purposes; water used for fisheries and wildlife purposes, and water used for any other purposes. Different standards apply to different modes of usage. These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources.

Fortunately for this project the water sources for Mombasa North Mainland meet the requirements however due to the old pipelines in the area, the water quality may negatively be impacted, as such the proposed pipelines should ensure that the water maintains the quality of water from the treatment works and storage facilities. Water for human consumption should meet the following requirements:

Table 5-1: Quality Standards of Domestic Water

Parameter	**Value**
pH	6.5 – 8.5
Suspended solids	30 (mg/L)
Nitrate-NO_3	10 (mg/L)
Ammonia –NH_3	0.5 (mg/L)
Nitrite –NO_2	3 (mg/L)
Total Dissolved Solids	1200 (mg/L)
Scientific name (E.coli)	Nil/100 ml
Fluoride	1.5 (mg/L)
Phenols	Nil (mg/L)
Arsenic	0.01 (mg/L)
Cadmium	0.01 (mg/L)
Lead	0.05 (mg/L)
Selenium	0.01 (mg/L)
Copper	0.05 (mg/L)
Zinc	1.5 (mg/L)
Alkyl benzyl sulphonates	0.5 (mg/L)
Permanganate value (PV)	1.0 (mg/L)

The above water standards will have to be met by the Contractor when providing water for his staff as well as during the operation of the project. After completion of the works; during

water testing of the system, the quality of water should meet the above parameters. In addition during the operation of the system the water at the end of the distribution network should be checked annually on the quality of water to meet the standards highlighted above.

In addition the regulations give the recommended standards for effluent disposal, and being that the project area is not served by a public sewer, the Contractor's camp will have to have on site effluent treatment to meet before release into the environment.

5.4.3 The Environmental Management and Coordination (waste management) Regulation, 2006

The Waste Management Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to protect human health and the environment. The regulations place emphasis on waste minimization, cleaner production and segregation of waste at source.

These regulations will be of great importance particularly during the construction phase of the project. During the Construction, the Contractor will have to meet the requirements of the regulations, by providing solid waste sorting and transportation using a licensed transporter who will dispose of the solid waste to the designated receptacle.

The regulations will guide the Contractor's preparation of a waste management plan for all solid waste from the site and site related works.

5.4.4 EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009

These Regulations determine the level of noise that will permissible in particular during the construction of the improvements, the following factors will be considered:

- Time of the day;
- Proximity to residential area;
- Whether the noise is recurrent, intermittent or constant;
- The level and intensity of the noise;
- Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and,
- Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise.

The Contractor will have to meet the requirements of these regulations particularly during the construction process, where some of the construction activities are bound to make some level of noise. These regulations are summarised in the table below:

Table 5-2: Table showing Permissible Noise Level for a Construction Site

		Local Maximum Noise Level Permitted in Decibels	
		Day	**Night**
1.	Health facilities, educational institutions, homes for disabled etc.	60	35
2.	Residential areas	60	35
3.	Areas other than 1 and 2	75	65

	above		

In addition the IFC regulations for permissible noise levels are summarized in the table below:

Facility		**Maximum Noise Level Permitted in Decibels**	
		Day	**Night**
1.	Residential; institutional; educational	55	45
2.	Industrial; commercial	70	70

Comparatively both regulations are relatively similar, as such the local regulations will be used.

5.4.5 Draft Environmental Management and Coordination (Air Quality) Regulations, 2009

The objective of the Regulations is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources such as mobile sources (e.g. motor vehicles). The Contractor will have to ensure all his machinery do not exceed the emissions made in the regulations (presented in the first schedule of the regulations (Nitrogen Oxides NH_3 – 100-400 mg/Nm^3, Hydrocarbons – 400 – 2000 mg/Nm^3 and Hydrogen Sulphides 50 – 200 mg/Nm^3).

5.4.6 National Guidelines on Safe Management and Disposal of Asbestos

These guidelines highlight the common types of asbestos in the Country. The guidelines also highlights safe methods of handling, transportation and disposal of asbestos. The guidelines also highlight the fact that if the asbestos pipelines can be left undisturbed, they will pose no risk to the people in the surrounding areas, this will be the route taken by the project to avoid disturbing the asbestos pipelines. However as a precautionary measure for any interaction with the asbestos pipelines, the guidelines presented in this document, will be incorporated by the Contractor in handling, transportation and disposal of the asbestos.

5.5 WATER ACT 2016

This Act is an update of the Water Act of 2002. It makes provision for the provision of clean and safe water in adequate quantities and to reasonable standards of sanitation for all citizens.

The Act highlights the fact that the area service provider MOWASCO will be under the jurisdiction of the County, in accordance to the regulations set out by the Water Services Regulatory Board. This regulatory board will also determine the water tariffs in the area.

This Act will particularly impact the operation of the project, highlighting the roles of the major stakeholders in the operation of the facilities.

5.6 THE PUBLIC HEALTH ACT (CAP. 242)

Part IX Section 8 & 9 of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Part Xll Section 136 states that all collections of water, sewage, rubbish, refuse and other fluids which permits or facilitates the breeding or multiplication of pests shall be deemed nuisances The Act addresses matters of sanitation, hygiene and general environmental health and safety. This Act will govern the Contractor's activities on site including ensuring the health and safety of employees including providing health services when it comes to venereal diseases.

5.7 THE LAND ACT, 2012

This Act applies to all land declared as public land in Article 62 of the Constitution and all private land as declared by Article 64 of the Constitution.

The Act identifies all public land, of importance to this project will be road reserves where the pipelines will be located.

The enactment of the Land Act, Sec 157(2), criminalized encroachments on public land as follows:

i. Unlawful occupation of public land is an offence which attracts fines of up to KES 500,000 and if a continuous offence, a sum not exceeding KES 10,000 for every day the offence is continued;
ii. Wrongful obstruction of a public right of way is an offence and attracts a fine of up to KES 10,000,000 and if a continuous offence, a sum of up to KES 100,000 for every day the offence is continued; and
iii. In addition to these criminal sanctions, any rights over land that were obtained by virtue or on account of an offence may be cancelled or revoked.

5.8 CITIES AND URBAN AREAS ACT 2011

This act identifies Mombasa as a city due to its integrated urban area. The city is under the jurisdiction of boards which carry out the duties of the County Government. The various boards within the city are charged with:

a) exercise executive authority as delegated by the county executive;
b) ensure provision of services to its residents;
c) impose such fees, levies and charges as may be authorised by the county government for delivery of services by the municipality or the city;
d) promote constitutional values and principles;
e) ensure the implementation and compliance with policies formulated by both the national and county government;
f) make bye-laws or make recommendations for issues to be included in bye-laws;
g) ensure participation of the residents in decision making, its activities and programmes in accordance with the Schedule to the Act; and
h) exercise such other powers as may be delegated by the county executive committee.

This Act identifies the importance of consulting with the county council and its departments for the proposed project in order to get opinions and recommendations for the successful implementation of the project. In addition, with the new Water Act, the County Council will be a major part of the operation of the proposed project, as well as being a key stakeholder in the resettlement of PAPs.

5.9 PHYSICAL PLANNING ACT (CAP 286)

Under the physical planning act, physical development activities are supposed to be carried out according to the physical plans. Accordingly the processes of physical planning involve two stages; the plan making stage and the development control stage. The former involves drawing up the actual plan to indicate the various activities and zones whereas the later involves the process of determining applications by developers to carry out specific development activities. Section 36 states "if in connection with a development application a local authority is of the opinion that proposals for the proposed pipelines or any other development activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an environment impact assessment report". This ESIA covers the proposed works.

5.10 OCCUPATIONAL SAFETY AND HEALTH ACT

This legislation provides for protection of workers during construction and operation phases of the project. This act will provide some of the mitigation measures for any negative impacts in particular those concerning the workers within the site.

5.11 THE HIV AND AIDS PREVENTION AND CONTROL ACT

This is an Act of Parliament to provide measures for the prevention, management and control of HIV and AIDS, to provide for the protection and promotion of public health and for the appropriate treatment, counseling, support and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes.

This Act will ensure that the Contractor makes provision for VCT services for employees and locals, as well as promotes public awareness. This will go a long way in ensuring stigmatization of HIV and AIDS is reduced as well as managed during the construction period.

5.12 THE SEXUAL OFFENCES ACT, 2006

This Act protects people and employees from any unwanted sexual attention or advances by staff members. This act ensures the safety of women, children and men from any sexual offences which include: rape, defilement, indecent acts. This law will govern the code of conduct of the Contractor's staff and provide repercussions of any wrong doing.

5.13 THE CHILDREN ACT, 2001

This Act protects the welfare of children within the Country. The Act identifies Children as a person below the age of 18 years old and protects them from exploitation. Of particular importance to this project, is section 10, which protects the child from:

- Economic exploitation.
- Any work that interferes with his/ her education, or is harmful to the child's health or physical, mental, spiritual, moral or social development.

5.14 THE COUNTY GOVERNMENTS ACT, 2012

The promulgation of the 2010 Constitution brought about County Governments. This Act highlights the role of the County Government. The County Government will be in charge of

all development activities within the County, as such will be a major stakeholder for the proposed project.

5.15 THE NATIONAL MUSEUMS AND HERITAGE ACT, 2006

This is an act of parliament 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. Due to the project area's rich and diverse history and background, there might be historical and cultural sites which may be affected. However it should be noted that during the ESIA no historical or cultural heritage sites were identified, however there is still a possibility of uncovering buried heritage sites that will need to be preserved, or moved taking into account their value. The chance find procedures presented in appendix 11.3 of this report taken into account this act for its implementation.

5.16 WORLD BANK SAFEGUARD POLICIES

5.16.1 Operational Policy (OP) 4.01: Environmental Assessment, 2001

Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations. The purpose of Environmental Assessment is to provide guidance for environmental assessment of the WB financed projects, improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted. The improvements on the distribution network in the Mombasa North Mainland are considered EA Category A, however the impacts are anticipated to be low and specific to the project site and reversible with implementation of the proposed mitigation measures.

5.16.2 The Bank's Operational Policy 4.12: Involuntary Resettlement

This is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement.

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

The proposed pipelines will be located within road reserves as such no permanent land resettlement is foreseen. However there is some encroachment of businesses, lawns and fences for which a resettlement action plan will have to be conducted.

5.16.3 World Bank Policy on Access to Information, 2010

The World Bank policy on access to information sets out the policy of the World Bank on public access to information in its possession. This Policy supersedes the World Bank Policy on Disclosure of Information, and took effect on July 1, 2010.

This Policy is based on five principles:

- Maximizing access to information.
- Setting out a clear list of exceptions.
- Safeguarding the deliberative process.
- Providing clear procedures for making information available.
- Recognizing requesters' right to an appeals process.

In disclosing information related to member countries/borrower in the case of documents prepared or commissioned by a member country/borrower (in this instance, safeguards assessments and plans related to environment, resettlement, and indigenous peoples, OP/BP 4.01, Environmental Assessments, OP/BP 4.10 and OP/BP 4.12 Involuntary Resettlement); the bank takes the approach that the country/borrower provides such documents to the Bank with the understanding that the Bank will make them available to the public.

5.17 INTERNATIONAL FINANCE CORPORATION AND WORLD BANK ENVIRONMENTAL, HEALTH AND SAFETY (EHS) GUIDELINES

These are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). 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 General EHS Guidelines are used in addition to the local guidelines in order to provide mitigation measures for the various environmental and social impacts that will be identified in this report.

The main EHS guidelines that will be used alongside local policies include:

5.17.1 Environmental Guidelines

These guidelines will govern the Contractor's activities during the construction of the pipelines and the construction works impacts on the physical environment. The guidelines include:

1) Air Emissions and Ambient Air Quality – which provide the air quality standards, limits and monitoring requirements for construction works. The guidelines incorporate WHO air quality guidelines on the major air pollutants expected from the Contractor's machinery and equipment. Baseline and annual air quality measurements should be taken to establish the impacts of exhaust from the Contractor's works.
2) Wastewater and Ambient Water Quality – These guidelines will be key particularly in the Contractor's camp and the impacts of wastewater generation and treatment before release into the environment, in order to prevent pollution of the surrounding physical environment including the Indian Ocean. Due to the fact that the project area is not sewered, the Contractor will have to establish onsite treatment of waste water, proper channeling of stormwater to prevent contamination of the physical and social environment. The guidelines call for monitoring of wastewater from the site through testing and inspections for which the Contractor will have to establish a plan for management and monitoring.
3) Hazardous Materials Management - These guidelines will mainly govern the handling and disposal of hazardous materials, under this project the major hazardous material is the old Asbestos Concrete pipes which if not handled properly can have a negative impact on the health of the workers and the local community. If there will be interaction of humans with asbestos, the guidelines call for a management plan for the hazardous material including identifying the risk posed by the material, and

establishment of a suitable removal and disposal of the material, including the health and safety of the workers coming in contact with the material and the surrounding community. The Contractor will have to prepare a plan that conforms to these guidelines when dealing with the Asbestos Concrete pipes.

4) Waste Management – All construction works are expected to produce one or more forms of waste. The laying of the pipelines will be no exception. Construction wastes and Domestic wastes are expected from the Contractor's site as well as the camp. The Contractor will have to prepare a waste management plan using these guidelines that conform to the local legal framework provided in this chapter.
5) Noise – Use of several equipment and plant is bound to generate some level of noise, which are bound to have a negative impact on the surrounding environment and in particular sensitive receptors. These impacts will be shortlived during the construction phase of the project, and if minimal mechanization is employed the impacts can be reduced further. The guidelines also provide the maximum noise levels, provided in table 5.2, which the Contractor should strive to adhere to. The guidelines also call for baseline and annual monitoring of noise generation within the Contractor's site to establish compliance to the guidelines and local regulation.

5.17.2 Occupational Health and Safety Guidelines

These guidelines are geared towards ensuring the safety of the staff on site and within the Contractor's camp. The guidelines with regards to occupational health and safety include:

1) General Facility Design and Operation – These guidelines will guide the Contractor's workspace. Being that the project area is in the Coast region of the Country, characterized by high temperatures the Contractor will have to provide suitable potable water supply for the staff, a clean eating area, suitable lavatories and showers, fire precaution measures (extinguishers and safety drills) and first aid services.
2) Communication and Training – This will provide for communication and training of staff and visitors to the site, to govern behavior within the site. This is necessary to ensure safety while operating within the site. The Contractor will need to employ a health and safety officer fulltime on site who will be in charge of ensuring safety and communication of safety within the site.
3) Physical Hazards – These guidelines will govern the exposure of the staff to physical dangers including deep trenches, noise, dust, welding, manual handling, work environment temperatures. The guidelines provide fall protection within the trenches and work hour limits (8 hours maximum).
4) Chemical Hazards - Chemical hazards represent potential for illness or injury due to single acute exposure or chronic repetitive exposure to toxic, corrosive, sensitizing or oxidative substances. The old pipelines such as the Asbestos Concrete Pipes will pose a chemical air risk to those exposed to the work environment. The guidelines recommend the formation of an asbestos managing plan which clearly define the location of the pipes, its conditions (friable or not), a means of working to avoid interference with the asbestos to avoid damage and training of staff that may come into contact with the material.
5) Personal Protective Equipment (PPE) - Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. The Contractor will have to provide the relevant PPE for

staff on site for the different job descriptions. In addition visitors to site will have to be provided with some minimal form of PPE during their visits.

6) Monitoring - Occupational health and safety monitoring programs should verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The Contractor will have to employ a health and safety officer who will come up with an occupational health and safety monitoring program for implementation by the Contractor. In addition the Contractor will provide a clinic and log of accidents and incidences on site as a control measure for ensuring health and safety.

5.17.3 Community Health and Safety Guidelines

These guidelines complement the environmental and occupational health and safety guidelines. However these guidelines specifically address the impact of the project activities on the surrounding community. The guidelines involve the following aspects:

1) Water Quality and Availability – Some of the Contractor's activities will interfere with the water supply to some areas. In these cases, the Contractor should give prior notice to the residents on a schedule of interruption so as to assure planning.
2) Structural Safety of Project Infrastructure – All the project pipelines will be located within existing road reserves, as such open trenches may pose a risk to pedestrians. As such safety measures have to be taken into account. The Contractor will have to provide physical buffers such as cordons to prevent falls into the trenches, as well as safe crossing points across the trenches at suitable intervals to provide safe crossing. In addition the Contractor should provide concrete barriers or similar to segregate motor traffic from the work space.
3) Traffic Safety – Due to the fact that the project area is located within an urban setting, the area has high vehicular traffic. As such the Contractor will have to provide a traffic management plan in order to ensure safety of motorists and other road users. The traffic management plan will include alternative routes for transport, concrete barriers to separate the work area from vehicles, a traffic controller to divert traffic and road signage.
4) Emergency Preparedness and Response – These are designed to deal with events and acts that are unplanned when a project operation loses control, or could lose control, of a situation that may result in risks to human health, property, or the environment, either within the facility or in the local community. Emergencies do not normally include safe work practices for frequent upsets or events that are covered by occupational health and safety. The Contractor will prepare a emergency preparedness and response plan, including training of staff, drills to gauge responses to preparedness, and communication with the local community in case of rinse.

5.17.4 Construction and Decommissioning Guidelines

These guidelines will govern the project components that will require decommissioning including the pipelines and camp. The Contractor will have to prepare a decommissioning plan for all these features taking into account the previous EHS guidelines mentioned above.

5.18 INSTITUTIONAL FRAMEWORK

This section deals with the institutions involved in environmental management and water provision in the country as well as their roles.

5.18.1 National Environment Management Authority

NEMA was founded and mandated under EMCA to exercise general supervision and coordination over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment.

This ESIA Project Report will be submitted to NEMA for review and further issuance of license to undertake the proposed project. The annual environmental audits shall also be submitted to NEMA.

Any complaints by the public on environmental pollution is lodged with NEMA for follow up and intervention.

5.18.2 Ministry of Water and Sanitation

This is the main body in charge of water and sanitation in the country, which is mandated by the Water Act of 2016. Its core mandate is to ensure water resources availability and accessibility by all.

The ministry's mandate is to contribute to national development by promoting and supporting integrated water resource management to enhance water availability and accessibility. This project is under the Ministry of Water and Sanitation to improve water supply in the Mombasa North Mainland.

5.18.3 Coast Water Services Board (CWSB)

The Coast Water Services Board (CWSB) is a parastatal (Government Owned and Autonomous) created under the Water Act, 2002 undergoing restructuring under the new Water Act 2016 and established through a Gazette Notice No. 1328 of 27th February 2004. The Board's main responsibility is the provision of efficient and economical water and sanitation services to the people of the Coast Region. The CWSB covers the following six counties in the region: Mombasa, Kwale, Kilifi, Taita-Taveta, Lamu and Tana River. The CWSB operates under the Parent Ministry of Water and Sanitation.

The board is a major stakeholder in the project since it deals with providing bulk water to the County and project area, through the Baricho Wellfield in Malindi and the Nguu Tatu reservoirs.

5.18.4 Mombasa Water Supply & Sanitation Company Limited (MOWASCO)

Mombasa Water Supply & Sanitation Company Limited is a limited liability company that was established in March 2011. The company took over the operations of water and sewerage services provision in Mombasa County as from 1st September 2005. Under the Water Act 2016, the Company is now under the jurisdiction of the County Government of Mombasa.

The company has the mandate to providing cost effective and affordable quality water and sanitation services to the residents of Mombasa County. In discharging the mandate the company is expected to undertake the following responsibilities:

- Provide quality and economical water and sanitation services to consumers.
- Billing for water and sanitation services and ensure timely collection of dues.
- Routinely maintain water and sanitation services and infrastructure.

- Ensure that standards and licensing requirements are compiled with as stipulated by the Service Provision Agreement (SPA) signed with Coast Water Services Board.

MOWASCO is the main beneficiary of this project and will operate and manage the pipelines after completion of the construction works.

5.19 INTERNATIONAL CONVENTIONS AND TREATIES

Some of the international resolutions relating to the general adequacy and conditions of water resources include:

1) Rio de Janeiro Earth Summit, 1992 Agenda 21- deals with the protection of quality and supply of freshwater resources: application of integrated approaches to the development, management and use of water resources
2) World summit on sustainable development
3) 3rd World Water Forum held in Kyoto, Japan in 2003 which resolved to:

a) Reduce by half the proportion of people without access to hygienic sanitation facilities by 2015
b) Reduce by half the people without sustainable access to adequate quantities of affordable and Clean water
c) Provide water, sanitation and hygiene for all by 2025; and
d) Ensure environmental sustainability during the same period.

6 PUBLIC CONSULTATIONS

6.1 LEGAL REQUIREMENTS

6.1.1 Government Policy on Public Consultation

The overall objective of the Government is to involve communities in policy formulation and implementation at the local level. More specifically, the Community Action Planning Programme objective is to put in place a durable system of intra-community co-operation through collective action, which creates communal discussion forums for the implementation of development activities.

6.2 PERSONS OR AGENCIES CONSULTED

The key issues associated with the establishment pipelines will often relate to wayleave establishment, loss of flora and fauna, pollution, disruption of livelihoods, community safety, traffic management, communicable diseases and employment and trade opportunities.

Effort was not spared to contact all with information on the following issues:

- Assessment of the baseline environmental and social conditions
- Consideration of feasible and environmentally &socially preferable alternatives
- Requirements under Kenya country laws and regulations, applicable international treaties and agreements
- Protection of human rights and community health, safety and security (including risks, impacts and management of project's use of security personnel)
- Protection and conservation of flora and fauna
- Sustainable management and use of renewable natural resources (including sustainable resource management through appropriate independent certification systems)
- Use and management of dangerous substances and major hazards assessment
- Labour issues (including labour standards), and occupational health and safety
- Socio-economic impacts & fire prevention and life safety
- Involuntary resettlement
- Impacts on affected communities, and disadvantaged or vulnerable groups
- Cumulative impacts of existing projects, the proposed project, and anticipated future projects
- Consultation and participation of affected parties in the design, review and implementation of the project
- Efficient production, delivery and use of energy
- Pollution prevention and waste minimization, pollution controls (liquid effluents and air emissions) and solid and chemical waste management.

As such a cross-section of key informants from various institutions were consulted in Mombasa County as indicated by the following consultation register.

Table 6-1: Key Informants interviewed during the ESIA study

No.	Name	Office	Designation	Contacts
1	Mr. Raphael Mwanyamawi	Minstry of Health	Chief Public Health Officer	+254710747486

			(CPHO)	
2	James K. Kairu	Ministry of Education	County Director of Education (CDE)	+254721316887
3	Eng. Abdulmajid Salim	Kenya Urban Roads Authority (KURA)	Assistant Director	+254714633611
4	Eng. Peter M Migosi	Mombasa County Roads Department	Chief General Manager	+254721794704

6.2.1 Overview from the Chief Public Health Officer Mombasa County

The CPHO welcomed the Consultants to Mombasa, explaining that the County experiences water shortage throughout the year. He explained that Nyali area only has two public health institutions ie. Kongowea health centre and Ziwa la Ng'ombe dispensary, which only offered outpatient services, more serious cases are referred to the Coast General Hospital, or other private hospitals.

With regards to the health issues in the area, the CPHO explained that the common diseases in the area include diarrhea, respiratory diseases and Malaria are common in the area. These diseases are mostly due to poor sanitation and hygiene. He gave an example of the low income areas in Bombululu and Kongowea where some of the residents made use of pit latrines, some of which were sited next to shallow wells which were used for domestic use.

In addition to the common diseases, the area and county in general had an outbreak of Chikungunya Fever, which is caused by the same mosquito that causes Dengue Fever. These mosquitoes breed in fresh water, particularly in storage tanks. The CPHO identified that the disease could be related to the water shortage in the area, since majority of the households stored fresh water in storage tanks which provide breeding grounds for the mosquitoes.

Concerning activities carried out by the Ministry with regards to initiatives to reduce water borne diseases, the CPHO stated that they provide chlorine tablets during outbreaks to minimize the effect of water borne diseases. In addition the Ministry holds public education drives which educate people on proper water storage (to eradicate Chikungunya), and proper hygiene practices.

With regards to the successful implementation of the project, stating that the project would help the people in the area, he however stated that pipelines in the low income areas should be looked into.

6.2.2 Overview from the County Director of Education

The CDE welcomed the team to Mombasa, stating that the education sector would benefit from the proposed project.

He stated that the Nyali area had 21 secondary schools 4 of which were public and 17 private; 78 primary schools, 64 of which are private and 14 public. The area however does not have any public tertiary institutions but a few private ones.

He further explained that majority of the schools in the area had a water connection, however due to the lack of water, they bought water from water vendors in the area, as various water

programs in the area (KWS and WASH). He further pointed out that most of the institutions had a feeding program hence more need for adequate water.

With regards to the school populations and issues in the area, he highlighted that the ratio of boys to girls is 50:50, however there were a few cases of dropouts due to early marriages and employment. In addition the area has cases of absences in schools due to parents not being keen on education, disease outbreaks, drug and substance abuse. These cases were particularly rampant in the low income areas of Nyali.

He finally stated that the project would be beneficial to the schools in the area due to reduced costs of buying water from vendors and paying for water to MOWASCO. He further added that other water harvesting methods be employed in the area.

6.2.3 Overview from the Assistant Director KURA

The Assistant Director began by stating that with the new devolved system in the country, KURA only had a few roads under its jurisdiction in the project area, these included:

1. Links Road
2. Part of Beach Road
3. Cement Road

With regards to the proposed project, the Assistant Director explained that KURA had no opposition to the project, they only recommendation is that the Contractor restores all wayleaves and road furniture to the pre-pipeline construction level, as well as lay the pipelines deep so as to prevent negative impacts during road works.

6.2.4 Overview from the Chief General Manager Mombasa County Roads Department.

The Engineer stated that the County had taken over the implementation of roads in the area, and had made great strides in the improvement of the road network. He stated that the road corridor was home to various stakeholders and their services (KPLC, fibre optic cables, among others). As such he requested that MOWASCO provide plans of the proposed pipelines to their office.

6.3 PUBLIC CONSULTATION

The Consultant conducted public consultation meetings in the project area following written and verbal communication with the local administration, ward representatives and the Nyali Residents Association. The table below summarises the public consultation meetings held.

Table 6-2: Summary of the Consultation meetings

No.	Meeting	Attendees		Location	Date
		Male	Female		
1.	Kick off meeting at KWSCRP	High level meetings		KWSCRP offices Nairobi	16/01/2018
2.	Kick off meeting at KWSCRP PMU			KWSCRP PMU offices in Mombasa	23/01/2018

No.	Meeting	Attendees		Location	Date
		Male	**Female**		
3.	Meeting with county administration			Nyali Sub-county offices	13/02/2018
4.	Meeting with Ward Administrators	5	6	Nyali Constituency offices	13/02/2018
5.	Meeting with representatives of the North Coast Residents' Association	4	7	Member's residence on Coral Drive	13/02/2018
6.	Meeting with MOWASCO	3	3	MOWASCO offices	28/02/2018
7.	Public Consultation Meeting with Ziwa la Ng'ombe Residents	46	22	Mwavila Grounds	3/3/18
8.	Public Consultation Meeting with Kongowea and Mkomani Residents	14	5	Chief's camp Kongowea (Kongowea and Mkomani)	7/3/18
9.	Public Consultation Meeting with Maweni Residents	27	29	Elim Church	13/3/18

The participants were made up of village elders, women representatives, youth representatives, religious leaders, teachers, KWSCRP and MOWASCO representatives and the local administration.

The locations of the meetings are shown in the figure below:

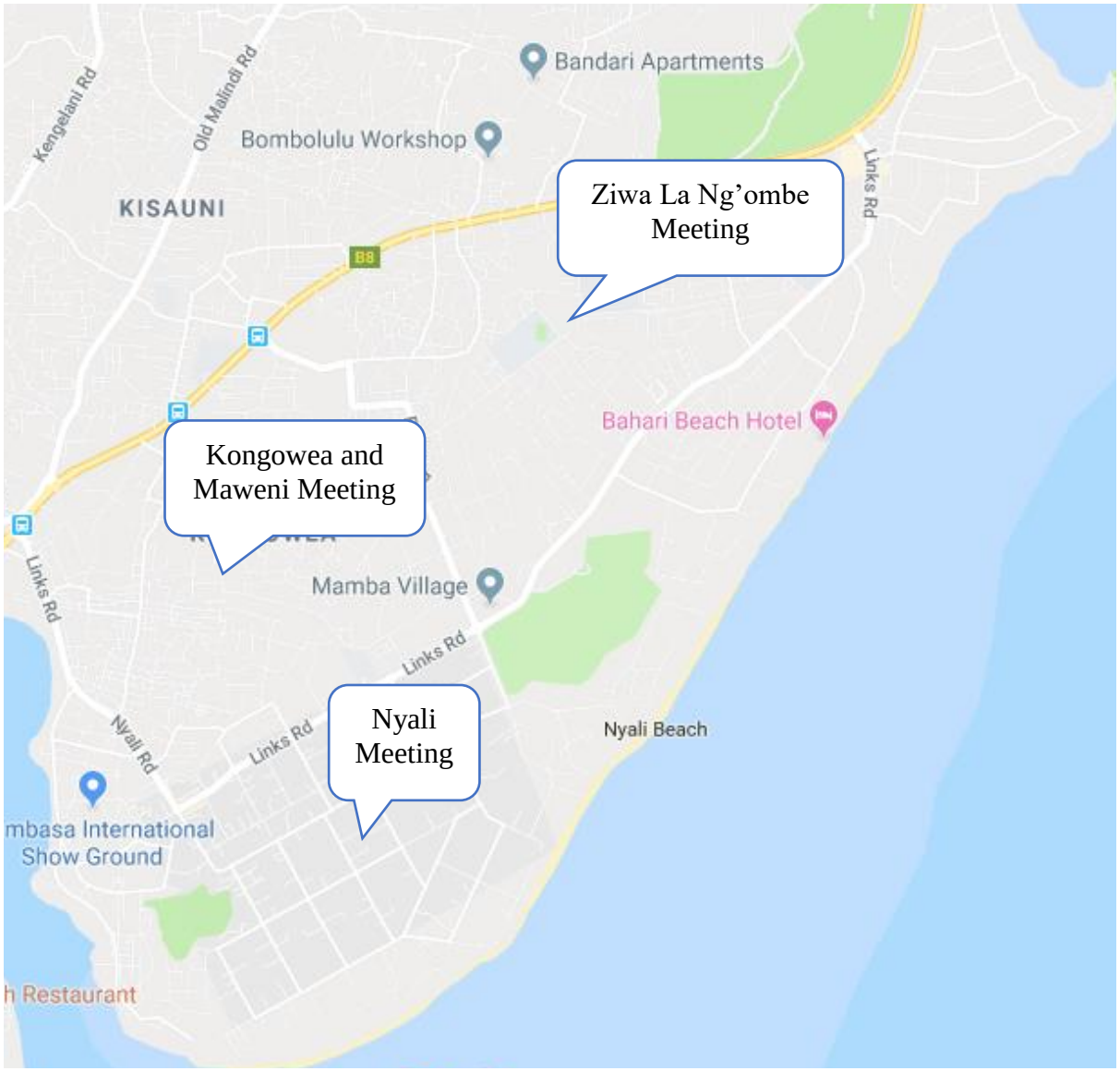


Figure 6-1: Map of Public Consultation Meetings

Minutes of the meetings are provided in appendix 11.2 of this report.

6.3.1 Findings of the meetings

The meetings included a presentation by the Consultant on the proposed works, the various environmental and social impacts that may arise from the project including resettlement at along the pipelines. The consultant however pointed out that the Designers had tried their very best to minimize resettlement and that the proposed works would be located within road reserves.

Being a public consultation meeting, feedback from the stakeholders was obtained with majority of the stakeholders approving of the project however they stated that water supply in Mombasa needs to be augmented for the full success of the project. The table below provides a summary of the issues raised during the meetings

Table 6-3: Summary of the Issues Raised

No.	Issue	Resolution
1	More pipeline connectivity in the informal areas	The project was currently covering pipelines in both the informal and more affluent areas of Nyali Sub-County.
2	Kisauni Side of Mombasa North was not included in the report	There were already some works being undertaken in the Kisauni area under WaSSIP.
3	Employment for local youth during the construction, as well as consideration for assigning water kiosks to the youth, women and the disabled.	Jobs during construction would be provided to the locals unless the required skill is unavailable.
4	Compensation for affected asset	A RAP was being undertaken to ensure compensation or rehabilitation of affected assets.
5	Provision of Corporate Social Responsibility in the project.	This was noted and would be included in the ESIA.
6	The fear of non-revenue water forcing the residents to pay for losses of water	The current project was being undertaken to reduce the impact of non-revenue water
7	The measures being taken to ensure no damage to the new pipes by Neem trees	This would be taken into consideration in the ESIA. Planting trees that would not affect the pipelines
8	The potential increase in the price of water after construction. Since the residents are currently experiencing high prices but not getting any water	The proposed project was being done so as to enhance the water supply to the area, in order to ensure no dissatisfaction with paying for bills without receiving water.
9	High prices being charged by rogue water vendors within water Kiosks in Informal settlements	MOWASCO would look into the issue.
10	How the pipes will work if there is no additional source of water, an additional water should be sought before the pipelines so that they were assured of water	This project is a component of Mwache Dam which intends to improve water supply to Mombasa.
11	The formation of the PAP committee procedures	There will be several PAP committees formed in the various areas in order to ensure that PAPs are included in the implementation of the RAP. In addition there will be general grievance committees to deal with the issues of the local communities.

No.	Issue	Resolution
12	A background on the Mwache Dam	Mwache Dam was a major project being undertaken in Mombasa to improve the water supply. These pipelines are designed to convey the additional water source.
13	If the project had included water Kiosks in the design	The current project was to improve the pipelines in the project area, through replacing or augmenting water pipelines. As such the pipelines would serve the existing water kiosks.

6.4 DISCLOSURE OF THE ESIA

Disclosure involves making the ESIA available to the public, and any interested persons. Disclosure of the ESIA report will be done through the MOWASCO, KWSCRP and World Bank websites which can be accessed by interested parties.

Since the project area is in an urban area, where majority of the residents have access to the Internet, the report can easily be downloaded and read by the local community. Notice will be given to the Nyali Resident's Association that the ESIA is available on the aforementioned websites. As an extra precaution particularly in the informal areas, printed reports will be given to the local administration for use by the local community.

6.5 CONSULTATION DURING THE PROJECT DURATION

The Consultant also proposes that continuous consultation be carried out throughout the construction phase of the project using focus group discussions to ensure interested stakeholders are aware of construction procedures and provide a forum for feedback and recommendations for implementation in the construction, the consultation will occur during the environmental supervision, monitoring, and evaluation which will be carried out every four months. In addition there is a grievance redress procedure which is provided in chapter 8.4 of this report.

7 ENVIRONMENTAL AND SOCIAL EFFECTS OF THE PROPOSED PROJECT

This chapter presents the general environmental and social impacts which may result from the proposed project. The emphasis will be initially on the specific impacts that are likely to result from the nature of works including excavation, laying of pipelines and fittings, concrete works for the various valves and chambers.

In general, successful implementation of the project will have high environmental and socio economic benefits to the people and will contribute to the improvement of the water infrastructure in the area in preparation for the completion of Mwache Dam. Overall, expected negative impacts are related to the earth works and laying of the pipelines. These impacts are localized and not considered significant and long-lasting and can be mitigated through appropriate mitigation measures. The severity and duration of these impacts can be minimized by ensuring that the excavation and construction works are limited to short working sections, and that works are carried out rapidly and efficiently. Table 7-1: Characterization of Impacts presents a characterization of expected impacts.

Table 7-1: Characterization of Impacts

Aspect	Predicted Impact	Characterization of Impacts								
		Nature		Effect		Time Range			Reversibility	
		Positive	Negative	Direct	Indirect	Short Term	Medium Term	Long Term	Reversible	Irreversible
Traffic	Increased traffic along the project routes		X	X		X				X
Ambient Air Quality	Increased local pollutant emissions and trace constituents such as VOCs Increased GHG emissions such as CH_4 and CO_2		X	X		X			X	
	Increased levels of dust and particle emissions from construction vehicles and equipment		X	X			X		X	
soil/water pollution	Contamination of ocean from oil spills during construction		X	X			X	X		X
	Surface water pollution from construction wastes		X	X			X	X	X	
Noise and vibrations	Increase of noise and vibration levels due to construction activities and traffic		X	X		X			X	

Aspect	Predicted Impact	Characterization of Impacts								
		Nature		Effect		Time Range			Reversibility	
		Positive	Negative	Direct	Indirect	Short Term	Medium Term	Long Term	Reversible	Irreversible
Health & Safety	General construction related health and safety risks for workers and residents		X	X		X			X	X
	HIV/AIDS and increased disease risks.		X	X	X	X	X	X		X
	Improvement in public health and sanitation through provision of clean water.	X		X		X	X	X		
Socio-economics	Improvement of local and regional socio-economy due to improved water supply	X			X			X		
	Employment and job creation during construction and operation phases	X		X		X	X	X		
solid and liquid waste	generation of both solid and liquid waste at the construction camps		X	X		X	X	X	X	

Aspect	Predicted Impact	Characterization of Impacts								
		Nature		Effect		Time Range			Reversibility	
		Positive	Negative	Direct	Indirect	Short Term	Medium Term	Long Term	Reversible	Irreversible
Impacts on Flora and Fauna	Loss of flora and fauna within the project site		X	X			X		X	
Loss of Structures	loss of livelihood demolition of structures Loss of trees and lawns Potential loss of cultural sites		X	X				X		X
Gender	Increased harassment of females within and around the site		X	X		X			X	
Crime Management	Increased insecurity around the project sites		X		X		X		X	
Child Labour and Protection	Potential for exploitation of child labour		X	X		X			X	
Labour influx	Risk of social conflict as a result of increase in influx population		x	x	x		x		x	

7.1 IMPACT CATEGORIES

First the likely significance of the potential issues of concerns has been determined and ranked according to the following:

- Potential environmental impacts which are deemed to be highly significant and need thorough investigation in the ESIA
- Potential environmental impacts that are deemed to be moderately significant, and will require reasonable investigation in the ESIA
- Potential environmental impacts that are deemed unlikely to be significant, and will need to be listed, and addressed in some way, but which will not require detailed assessment in the ESIA.

Secondly, the following characteristics have been defined for each impact:

Nature:

- Positive: applies to impacts that have a beneficial economic, environmental or social result, such as additional economic activity or enhancement of the existing environmental conditions.
- Negative: applies to impacts that have a harmful or economical aspect associated with them such as economical cost, loss or degradation of environmental resources.

Effect:

- Direct: applies to impacts which can be clearly and directly attributed to a particular impacting activity.
- Indirect: applies to impacts which may be associated with or subsequent to a particular impacting activity, but which cannot be directly attributed to it.

Time Range:

- Short Term: applies to impacts whose effects on the environment will disappear within a 1 year period, or within the construction phase.
- Medium Term: applies to impacts whose effects on the environment will disappear within a 5 year period following the construction phase.
- Long Term: applies to impacts whose effects on the environment will disappear in a period greater than 5 years following the construction phase.

Reversibility:

- Reversible: applies to impacts whose significance will be reduced and disappear over time (either naturally or artificially), once the impacting activity ceases.
- Irreversible: applies to impacts whose significance will not be reduced nor disappear over time (either naturally or artificially), once the impacting activity ceases.

7.2 IMPACTS EMANATING FROM THE PROPOSED PROJECT

The impacts are identified at three stages:-

- pre- construction/Planning Phase Impacts
- during construction and
- post-construction (operation phase)

7.2.1 Planning Phase Impacts

These are commonly associated resettlement of people along the pipeline routes. It should be noted that the pipelines will be located along road reserves as such land acquisition and hence permanent relocation of domiciles is not foreseen. However due to encroachment along the roads some of the following assets may be affected.

1. Structures along the pipeline way leave within the road reserve
2. Trees and lawns along the pipeline way leave within the road reserve
3. Fences along the pipeline way leave and
4. Livelihoods along the pipeline route

Mitigation measures
The proposed pipelines will be located along road reserves to prevent permanent resettlement.
Project affected persons to be identified by type of loss through a detailed resettlement action plan, which has been prepared and submitted to the Client.
The affected persons to be compensated for loss of structures, trees, lawns, fences and livelihood productivity
MOWASCO and KWSCRP to agree with the local community on the form of compensation for loss of structures, trees, crops and livelihood (such as monetary terms and reconstruction/rehabilitation of the affected asset.). Once the community is fully compensated the contractor may move to site
The mitigation measures for social impacts are to ensure that the affected persons' living standards are improved or at least restored to previous levels before the construction after implementation of the project.

7.2.2 Construction Phase Impacts

Most of the potential environmental and social impacts associated with the construction phase will be negative and temporary and can be mitigated with the use of standard environmental management procedures. The potential social impacts or nuisance will be those typically associated with construction activities involving vehicles, equipment, and workers. The predicted impacts include the following:

1) Traffic Congestion

Traffic congestion is anticipated from site related traffic from Contractor vehicles. The project sites are located in a very busy area within Mombasa, as such there is bound to be increased traffic and interaction between the Contractor's vehicles and local traffic (motorized and non-motorised traffic).

Mitigation measures
The Contractor will provide a traffic management plan to provide safety measures for motorists, including alternative routes, road signs and barriers. Provide traffic controllers at junctions at work areas with red and green flags to control the traffic. The Contractor will provide road signs or notices to indicate ongoing works; The Contractor will effect traffic controls to avoid congestion and accidents on roads; The project area has several parallel routes which will be used as alternative routes, and work with the county government to come up with schedules of use. The Resident Engineer and Contractor should choose traffic routes to reduce the impact in the neighborhood avoiding, as far as practical any sensitive areas; For the site traffic the Contractor has to ensure that they Only park in designated parking areas; Don't block pedestrian routes; Don't block traffic routes; Obey the speed limit The resident Engineer has to ensure that the Contractor: i) Introduces segregated pedestrian walkways; ii) Introduce speed limits particularly in the residential areas; iii) Reduces the need for reversing vehicles, by introducing a one way system; iv) Uses a qualified BANKSMAN to control deliveries and reversing vehicles; v) Designates loading/unloading areas.

2) Site Related Oil Spills

During construction, oil spills may result from construction site equipment and storage, which may affect the flora, fauna, soils, and water ways in the area.

Mitigation Measures
The Contractor will ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks e.g. using dispersants or adding biological agents to speed up the oil breakdown for the construction machinery though induction and safety training (the contractor will propose a method of cleanup which will be subject to approval); In case of spillage the Contractor will isolate the source of oil spill and contain the spillage to the source of leakage before it makes it leaves the affected area, using sandbags, sawdust, absorbent material and/or other materials approved by the Resident Engineer; The Resident Engineer and the Contractor will ensure that there is always a

supply of absorbent material such as saw dust on site during construction, readily available to absorb/breakdown spill from machinery or oil storage, this can be incinerated after use;

- All vehicles and equipment will be kept in good working order, serviced regularly in accordance to the manufacturers specifications and stored in an area approved by the Resident Engineer;
- The Contractor will assemble and clearly list the relevant emergency telephone contact numbers for staff, and brief staff on the required procedures.

3) Soil-Related Impacts

All construction activities have some minor impacts on the soil. However, these are localised and restricted locally to the trenching areas for the proposed pipelines. It is expected that these impacts are also short-lived during construction and mitigation measures are recommended. The key impacts will revolve around soil erosion, contamination, disturbance of the natural soil structure and thus reducing the ecological function of the soil.

Following construction of the pipelines, water testing will be done after which, the pipelines will be buried. However if not done well may leave the surface unable to reproduce more plants or uneven ground which may pose a risk to public health and safety.

Mitigation Measures

- The valuable top soil containing organic material, nutrients as well as seeds and the soil fauna will be excavated separately and piled in an adequate manner for re-use.
- In cases where it is identified that during construction there is a danger of increased run-off or at the project site, temporary drainage channels or holding ponds will be employed
- After completion of the construction works, restoration of the ground by sowing adequate grass cover and planting of trees will be followed, therefore the impact is temporary and reversible.
- Replacement of neem trees with trees that do not destroy pipes.
- Plan emergency response measures in case of accidental oil spills.
- Following successful water testing, the Contractor should replace the removed overburden starting with the deeper levels of the soil profile and finishing with the valuable top soil coming in last to allow for revegetation and flatten the ground to match the existing ground level to reduce public health and safety risks.

4) Impacts on Water Resources

The various construction activities may have a negative impact on the Indian Ocean via natural drainage patterns as well as the storm water systems. Solid as well as liquid waste if not properly disposed of, may make its way into ground water, water courses and even the Indian Ocean, thus affecting the water resources in the area.

Mitigation Measures
Prepare and implement a waste management plan Ensure proper solid and liquid wastes disposal mainly from the construction camps, sites and offices. Ensure proper measures are in place for collection and disposal of spilled oils and lubricants. Provision of hand held water quality assessment equipment for on the spot assessments during the project duration and after handed over to the Client after construction, in case of any impact on water resources.

5) Socio - Economic Impacts

During construction the project will have clear benefits with regard to local employment opportunities. The project will additionally require various skills and services which may not be available on the local level but certainly on the regional level, e.g. pipe fitters, concrete workers, etc. for which appropriate personnel will be contracted.

The increase in employment will temporarily lead to an overall increase of income directly and indirectly (through increased demand of other local services). Consequently, food vendors will have new opportunities to sell their commodities to the construction workers.

Measures to improve the positive impacts include:

- Ensure skilled and unskilled if available is sourced locally.
- Wherever possible ensure manual labour provide even more job opportunities for locals.
- Skills transfer for some of the staff to promote learning.
- With consultation with local communities come up with suitable CSR measures for the community.

The major negative impact in will be that the in migration of people from different regions may have social risks which include but not limited to; increased illicit behaviour and crime, increased risk in the spread of diseases such as HIV/AIDS and communicable diseases, etc

Mitigation
Unskilled construction and skilled (if available) labor to be hired from the local population as far as possible to minimize on influx of foreigners into the community. Use of manual labor during excavation and construction works where possible to ensure more employment of locals and hence ensure project support throughout the construction process. Prepare a labour influx plan to manage labour influx Sensitize workers and the surrounding community on awareness, prevention and management of HIV / AIDS through staff training, awareness campaigns, multimedia, and workshops or during community Barazas. Provide an onsite clinic to provide VCT services to construction crew and provision of ARVs for vulnerable community members as well as provide first aid services

- The Contractor will enforce and maintain a code of conduct for his employees

6) *Air Quality*

Construction activities of materials delivery, excavation of trenches, concrete works and construction traffic will generate a lot of noise and dust especially during the dry seasons.

Vehicular traffic to the proposed site is expected to increase especially during delivery of raw materials. Vehicular traffic emissions will bring about air pollution by increasing the fossil fuel emissions into the atmosphere. Majority of the roads in the project area are to bitumen standards, however the minimal roads that are to murram and earth standards are bound to experience an increase in dust emissions to the neighbouring areas.

Mitigation:

- Use protective clothing like dust masks on construction crew.
- Take baseline air quality measurements and annual measurements to monitor air quality.
- Provision of hand held air quality assessment equipment for on the spot assessments during the project duration and after handed to the Client, in case of any complaints on air quality, especially near sensitive areas, a list of which have been provided in appendix 11.6 of this report.
- Construction sites and transportation routes (those that are murram and earth standards) will be water-sprayed on regularly up to three times a day, especially if these sites are near sensitive receptors, such as residential areas or institutions (hospitals, etc.).
- All the vehicles and construction machinery will be operated in compliance with relevant vehicle emission standards and manufacturer's specification to minimize air pollution.

7) *Noise Pollution*

Noise and vibration generated during construction by heavy construction machinery, such as excavators, bulldozers, concrete mixers, and transportation vehicles.

Generally, construction noise exceeding a noise level of 70 decibels (dB) has significant impacts on surrounding sensitive receptors within 50m of the construction site. These sensitive receptors include, schools and clinics in the area.

Mitigation:

- Avoid night time construction when noise is loudest. Avoid night-time construction using heavy machinery, from 22:00 to 6:00 near residential and sensitive areas. A list of identified sensitive areas is provided in appendix 11.6 of this report.
- No discretionary use of noisy machinery within 50 m of residential areas and near institutions, manual labour can be used at this point.
- Good maintenance and proper operation of construction machinery to minimize noise generation.

- Where possible, ensure non mechanized construction to reduce the use of machinery
- Baseline and annual noise measurement.
- Provision of hand held ambient noise quality assessment tools for on the spot assessments during the project duration and after handed to the Client, in case of any complaints on noise.

8) Impacts on Flora and Fauna

Removal of vegetation as well as thickets and trees will lead to loss of plants and animal habitats. The bio-diversity affected includes insects, small mammals, reptiles and birds. Water contamination with cement will cause it to be highly alkaline and toxic to plants and animals living along the pipelines.

Improper disposal of solid and liquid waste from the Contractor's camp will have a negative impact on the biodiversity surrounding the camp.

Mitigation:

- Re-plant the indigenous vegetation as much as possible once work is completed. However following recommendations by stakeholders avoid replanting of Neem trees and consult with KFS on the best tree species to replant.
- Spare the vegetation that must not necessarily be removed such as or replace the trees.
- Minimize the amount of destruction caused by machinery by promoting non-mechanized methods of construction.
- Ensure protection of the flora and fauna by proper handling of cement during civil works.
- The Contractor will ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks e.g. using dispersants or adding biological agents to speed up the oil breakdown for the construction machinery though induction and safety training (the contractor will propose a method of cleanup which will be subject to approval);
- Provide a waste management plan
- Provision of dustbin and sanitation facilities within the Contractor's camp to prevent seepage into the natural environment.

9) Public Health and Safety

Construction staff and the general public will be exposed to safety hazards arising from construction activities. It is proposed that the pipelines be located within existing road reserves, however there will be a possibility of interrupting access to road side businesses, facilities and houses.

The project works will expose workers to occupational risks due to handling of heavy machinery, construction noise, electromechanical works etc.

In addition some of the old pipelines being replaced are made of asbestos concrete, which has very many negative effects on public health and safety. However it is proposed to leave these pipes buried and undisturbed to prevent any negative impacts. However in case of any accidental interference with the asbestos pipes, a methods of dealing with it should be looked into.

Construction activities of vegetation clearing, excavation, materials delivery and concrete mixing and construction traffic will generate a lot of dust and this may affect the respiratory system.

The high temperatures in the area will expose the workers to difficult working conditions.

Construction sites may be a source of both liquid and solid wastes. If these wastes are not well disposed these sites may become a breeding ground for disease causing pests such as mosquitoes and rodents.

At the concrete mixing plant the exposure of human skin to cement may lead to damage of the skin.

Mitigation:

- Provide and implement an occupational health and safety plan.
- Ensure that all construction machines and equipment are in good working conditions and to manufacturer's specifications to prevent occupational hazards.
- Cordon off trenches and working areas with a reflective tape to ensure safety of pedestrians and provide crossing areas for access to cut off businesses, sensitive areas and structures.
- Contractor to come up with a hazardous substances plan for dealing with asbestos based on NEMA guidelines for approval by the RE. A sample protocol on handling asbestos has been provided in appendix 11.5 which can be used to advise the Contractor.
- Appointing a trained occupational health and safety staff and fire marshal on-site for the duration of the construction work.
- Provide workers with appropriate personal protective equipment (PPE).
- Provide workers with adequate drinking water and breaks.
- Provide a fire marshal and a health and safety officer fulltime on site
- Provide workers training on safety procedures and emergency response such as fire, oil and chemical spills, pipe bursts, asbestos interactions and other serious water loss risks.
- Roads passing through population centers will be water sprayed to reduce dust.
- Work to minimize or altogether eliminate mosquito breeding sites.
- Provide a waste management plan
- Fence off the site with security to avoid unauthorized access to the project

site(s) and hence potential injuries. • Provide clean toilets for workers, these toilets will be to World Health Organisation standards.

10) HIV & AIDS Impacts

In migration of people from different regions may lead to behavioural influences which may increase the spread of diseases such as HIV/AIDS.

Mitigation:
• Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS through staff training, awareness campaigns, multimedia and workshops or during community Barazas. Provide information, education and communication about safe uses of drinking water. • Provide an on-site clinic to provide VCT services to construction crew and provision of ARVs for vulnerable community members

11) Gender Empowerment Impacts

There is need to promote gender equality in all aspects of economic development and more so in construction. Women roles in construction are mainly confined to supply of unskilled labour and vending of foodstuffs to the construction workers. Where available skilled women will be used.

Mitigation:
• Ensure equitable distribution of employment opportunities between men and women • Provide toilets and bathrooms for both male and female workers on site

12) Service Delivery Impacts

The construction activities will cause disruption of services and access to utilities such as water supply, fibre optic cables, underground electrical cables and transportation within the project area. Where the water pipe crosses roads and driveways, excavation of trenches and laying down of the water pipes may cause disruption of transport within the project area. Trenching works may accidentally interfere with other utilities including underground fibre optic cables and electrical cables; however, the Environmentalist notes that during the baseline study, no actual utilities were encountered, but the ESIA will provide mitigation measures in case some of these utilities are interfered with. Trucks with heavy loads of construction materials may damage roads and footpaths during the construction process.

Mitigation:
• Provide a traffic management plan which will provide alternative routes, traffic controllers, concrete barriers and speed limits for motorists. • Provide appropriate signage to warn motorists and other road users of the construction activities, diversion routes to ward off traffic accidents. • The contractor should communicate any intended disruption of the services to enable the people to prepare e.g. by having emergency water storage and

provision facilities.
- If any utilities are accidentally interfered with during the trenching activities, the Contractor will immediately identify and contact the owner of the utility, assess damage and undertake repairs or facilitate the repairs.
- Areas being trenched to be temporarily cordoned off to avoid people and animals accidentally falling into open trenches.
- In the event that delivery trucks damage parts of the road, repair the spots in consultation with the local authorities.
- Ensure pipelines are laid deep enough to prevent interference with the relevant road sides, roads and walkways; and return reserve areas and road crossings to the state they were before construction.

13) Crime Management

Some of the pipelines will be located in informal settlements which are prone to a few incidences of crime including, stealing of construction materials or individual property, fighting, drug abuse and alcoholism among others.

Mitigation:

- Fencing off the Contractor's camp with plant and materials.
- Working with local committees (e.g. "nyumba kumi) to provide security within the site in addition to the Contractor's own security.
- Removing any employee who persists in any misconduct or lack of care, carries out duties incompetently or negligently, fails to conform to any provisions of the contract, or persists in any conduct which is prejudicial to safety, health, or the protection of the environment.
- Taking all reasonable precautions to prevent unlawful, riotous or disorderly conduct by or amongst the contractor's personnel, and to preserve peace and protection of persons and property on and near the site.
- Prohibiting alcohol, drugs, arms, and ammunition on the worksite among personnel.
- The contractor and Resident Engineer will register in a log all events of a criminal nature that occur at the worksite or are associated with the civil works activities.
- The contractor and Resident Engineer will report all activities of a criminal nature on the worksite or by the contractor's employees (whether on or off the worksite) to the police and undertake the necessary follow-up. Crime reports will include nature of the offense, location, date, time, and all other pertinent details.

14) Child Labour and Protection

The Children Act of Kenya prohibits contractors from "employing children in a manner that is economically exploitative, hazardous, and detrimental to the child's education, harmful to the child's health or physical, mental, spiritual, moral, or social development. It is also

important to be vigilant towards potential sexual exploitation of children, especially young girls. The contractor should adopt a 'Child Protection Code of Conduct'; that all staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour.

Mitigation:
Provide and implement a child protection strategy Ensure no children are employed on site in accordance with national labor laws Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police

15) Gender Equity, Sexual Harassment

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

Mitigation:
Provide and implement a gender based violence strategy, which will include: • Gender mainstreaming in employment at the worksite with opportunities provided for females to work, in consonance with local laws and customs • Gender sensitization of workers (this will be done by the HIV/AIDS services provider; see above) • Provision of gender disaggregated bathing, changing, sanitation facilities Grievance redress mechanisms including non-retaliation. Provide and implement an employee code of conduct The works contractor will be required, under its contract, to prepare and enforce a No Sexual Harassment and Non-Discrimination Policy, in accordance with national law where applicable.

16) Liability for loss of life, injury or damage to private property

Some of the Construction activities may lead to accidents that may be mild or fatal depending on various factors. During the implementation of the proposed project, accidents could be due to negligence on part of the workers, machine failure or breakdown or accidental falls into the pipeline trenches. These incidents can be reduced through proper work safety procedures.

In addition, during Construction, there may be damage to private property that may not be foreseen by the RAP.

Mitigation:
• Provision of PPE. • The workers will receive requisite training especially on the operation of the machinery and equipment • There will be adequate warning and directional signs. • Ensuring that the prepared code of conduct for staff is followed to prevent accidents. • Develop a site safety action plan detailing safety equipment to be used, emergency procedures, restriction on site, frequency and personnel responsible for safety inspections and controls. • Cordon off unsafe areas and provide safe crossing points across trenches • Provide an onsite clinic to provide first aid services to the staff. • Recording of all injuries that occur on site in the incident register, corrective actions for their prevention are instigated as appropriate. • Contractor to ensure compliance with the Workmen's Compensation Act, ordinance regulations and union agreements. • The Contractor to repair any damage done to private property.

7.2.3 Impacts during Operation & Maintenance

During the operation of the improved water supply network to the project area, the positive impacts greatly outweigh the negative impacts, and with proper maintenance, potential negative impacts can be mitigated.

1) Positive Environmental and Socio-Economic Impacts

The several positive impacts are summarized below:

- Proper infrastructure in preparation for improved water supply to Mombasa
- Reduction of Non-Revenue Water.
- Better access to safe drinking water leading to improved standard of living; and changes in exposure to both communicable and non-communicable diseases;
- Improvements in domestic hygiene and a reduction in health risks that were associated with poor water quality or inadequate access to services, as a result of improvements in drinking water quality and its availability;
- The program will contribute to increase in local development and employment as the local population are likely to be employed during the construction phase and after construction due to water related investments;
- Further increase in tourism in the area. The project area has many tourist attractions and destinations such as the beach hotels, as well as the Indian Ocean. The increase in water will allow for a more lucrative business opportunity in terms of hotels and tourist related activities.
- Increase in Land value within the project area, due to availability of water.
- Improved general hygiene in the areas served.

- ❖ Promote a more sustainable use of water resources with improvements in the infrastructure to reduce losses and introduction of better metering and billing procedures to encourage more efficient use of water;
- ❖ A comprehensive metering program (of production and consumers) is expected to keep the Non-Revenue Water (NRW- technical and commercial losses) at an acceptable level;
- ❖ Sanitation will also be promoted with its attendant improvement in the health of the people such as reduced incidence of water borne diseases.
- ❖ Improvements in metering and administrative billing procedures;
- ❖ The program is expected to contribute to poor communities well-being associated with improved services, stability, and health.
- ❖ Employment creation will be the key positive environment impact as operation and maintenance personnel will be required for the rest of the project life. The availability of water and easy access will trigger other developments and businesses.

The positive impacts may be ameliorated through continuous monitoring to ensure that the system is functioning at maximum efficiency to ensure maximum benefit to all. In addition the new source of water from Mwache will eventually provide adequate water to the system as such progress on the dam should be continued.

Other potential impacts typically associated with operation and maintenance activities are such as:

2) Generation of solid waste

The establishment of an adequate water distribution system will be mostly beneficial to the local community, however with the provision of water comes the increase in the generation of solid and liquid waste. Mombasa North mainland does not have a waste water reticulation system as such majority of the residents make use of private waste water treatment methods others do not. There are plans to design and implement a waste water treatment plant (waste water masterplan) in the Mombasa North Mainland.

Water supply will lead to an increase in the generation of solid and liquid waste, and with the area's proximity to the ocean the risk of untreated sewage making its way into the ocean.

Mitigation measures:
Provide adequate waste disposal facilities. Ensure collection of all solid waste from generation points, safe transportation to a central point where they are sorted out and safely disposed according to type to protect the environmental resources. Implementation of the sanitation masterplan which includes sanitation facilities in informal settlements, a sewerage network and the waste water treatment plant.

3) Increase in tariffs

The expected improvements in metering and administrative billing procedures are likely to result in the introduction of water bills in some areas and higher water bills in others.

Mitigation measures:
A tariff system will have to be looked into by making use of WASREB's tariff policy for providing sustainable and affordable water supply.

MOWASCO incorporates the “pro-poor” policy in its billing

7.2.4 Impacts during De-commissioning

De-commissioning of the Project is not envisaged. However some aspects of the project will require decommissioning including the old pipelines and the Contractor’s camp. Other project components including the new pipelines will be rehabilitated over time having served their useful life.

Before decommissioning, the Contractor will prepare a decommissioning plan for the elements that will require decommissioning.

1) Decommissioning of the old pipelines

The main pipelines that will be decommissioned will include the Asbestos cement pipes and other pipelines deemed unsatisfactory. Some of these pipelines if uncovered can have negative impacts on the health of those that come in contact with these materials.

Mitigation measures:
Provide a hazardous material management plan, especially the Asbestos Cement Pipes. A sample protocol on handling asbestos has been provided in appendix 11.5 which can be used to advise this.
Provide a waste management plan for all the removed pipelines

2) Decommissioning of the Contractor’s camp

After the completion of the construction of the pipelines, the Contractor will decommission his camp.

Mitigation measures:
Provide and implement a decommissioning plan including revegetation, disposal of waste material, and recycling of recyclable material.

8 ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT PLAN (ESMMP)

By design, the potential positive impacts of the project can readily be optimised while the potential majority of the negative environmental and social impacts are mostly restricted to the planning and construction period, with the negative impacts experienced during the operation phase of the project mitigated by continuous maintenance of the system. These are assessed and considered as minor to medium, being reversible and short-term and can be managed through well-defined mitigation and monitoring measures.

8.1 POSSIBLE ENHANCEMENT MEASURES

Possible enhancement measures of beneficial impacts would include the following:

- Construction should adhere to recommended best construction practices that make effective and economical use of locally available resources including materials, expertise and labour.
- Operation of the project should adhere to the operations and maintenance specifications prepared with the design
- Ensure that the poor and other vulnerable in the project area will be catered for by the project under the RAP.
- Ensure that social services provide education on appropriate hygienic conditions and taking into consideration gender particular roles and responsibilities.

8.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The negative impacts as well as their mitigation measures have already been discussed in Chapter 7.

This chapter highlights the various mitigation measures, the party responsible for implementing it and the costs, this data makes up the Environmental and Social Management Plan (ESMP) which is presented in Table 8 1 below.

The costs of the proposed mitigation measures some of which will have already been included in the main engineering Bills of Quantities and therefore need not be included in the Environmental mitigation costs, should be included in the Bill of Quantities as the Environmental Mitigation Costs.

Table 8-1: The Proposed Environmental and Social Management Plan (ESMP)

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
Pre-construction	Loss of structures within the road reserve	As a first step, the owners, type of structures are identified. The compensation will be done in accordance to the RAP.	KWSCRP/MOWASCO/ County government/National Land Commission	Values as per RAP Report	Lumpsum
Pre-construction	Loss of livelihoods within the road reserve	Loss of livelihoods to be valued and compensated to in accordance to the RAP	KWSCRP/MOWASCO/ County government/National Land Commission	Values as per RAP Report	Lumpsum
Pre-construction	Loss of trees lawns and fences within the road reserve	Loss of assets to be valued and compensated to in accordance to the RAP	KWSCRP/MOWASCO/ County government/National Land Commission	Values as per RAP Report	Lumpsum
Construction	Traffic Congestion	Provide and implement a traffic management plan Provision temporary road signs or notices to indicate ongoing works. Effecting traffic controls to avoid congestion and accidents on roads. Choosing suitable traffic routes to reduce the impact in the neighbourhood. Ensuring no interference with traffic through traffic control, designated parking, speed limits and hiring a banksman.	Contractor supervised by the Resident Engineer	50,000	Monthly

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
Construction	Site Related Oil Spills	Employee awareness on company procedures for dealing with spills and leaks from oil storage tanks. Containment of leaks. Provision of absorbent material Maintenance of contractor's plant Provision of relevant emergency numbers	Contractor supervised by the Resident Engineer	25,000 100,000	Annually Annually
Construction	Soil Related Impacts	Stock piling of soil for reuse Provision temporary drainage channels or holding ponds as a precautionary measure Restoration of the ground by sowing adequate grass cover and planting of trees. Planning emergency response measures in case of accidental oil spills. Following successful water testing, the Contractor should replace the removed overburden to original level to allow for revegetation and reduce public health and safety impacts.	Contractor supervised by the Resident Engineer	250,000 Restoration of ground costs covered under loss of flora and fauna Oil spill costs covered	Lumpsum
Construction	Impact on Water Resources	Provide a waste management plan Proper solid and liquid wastes disposal mainly from the construction camps, sites and offices.	Contractor supervised by the Resident Engineer	250,000 Oil spill costs	Annually

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		Ensuring proper measures are in place for collection and disposal of spilled oils and lubricants. Provision of hand held water quality assessment equipment.		covered 50,000	Lumpsum
Construction	Socio-Economic Impacts	Hiring unskilled construction and skilled (if available) labour from the local population as far as possible. Use of manual labour during excavation and construction works where possible. Prepare a labour influx plan to manage labour influx Sensitizing workers and the surrounding community on awareness, prevention and management of HIV / AIDS. Provide an on-site clinic to provide VCT services. Enforcing and maintaining a code of conduct for his employees Ameliorate positive socio-economic impacts	Contractor supervised by the Resident Engineer Public Health Officer Contractor supervised by RE and MOWASCO	Included in the Contractor's Cost Included in HIV/AIDS Impacts 1,000,000	Lumpsum
Construction	Air Quality	Use of protective clothing like dust masks on construction crew.	Contractor supervised by the Resident	Included in PPE Costs	

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		Take baseline air quality measurements and annual measurements to monitor air quality. Provision of hand held air quality assessment equipment. Regular water spraying of murram and earth roads and construction sites Operated and maintenance of contractor's plant in compliance with relevant vehicle emission standards and manufacturer's specification to minimize air pollution.	Engineer	5,000 per sample 50,000 Included in contractor's cost	Annually Lumpsum
Construction	Noise Pollution	Avoiding night time construction when noise is loudest near residential areas. No discretionary use of noisy machinery within 50 m of residential areas and near institutions or use of manual labour in these sections. Good maintenance and proper operation of construction machinery. Where possible, ensure non mechanized construction to reduce the use of machinery Baseline and annual noise measurement Provision of hand held ambient noise quality assessment equipment.	Contractor supervised by the Resident Engineer	Included in Contractor's cost 40,000 per sample 40,000	Lumpsum
Construction	Impact on	Re-planting the indigenous vegetation as	Contractor supervised	500,000	Lumpsum

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	flora and fauna	much as possible once work is completed. Taking into account recommendations from stakeholders and in communication with KFS Sparing the vegetation that must not necessarily be removed. Provide a waste management plan Promoting non-mechanized methods of construction. Ensuring protection of the flora and fauna by proper handling of cement during civil works. Ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks Provision of dustbin and sanitation facilities.	by the Resident Engineer County Officer- Water Energy and Natural Resources	Included in Contractor's cost	
Construction	Public Health & Safety	Ensuring proper maintenance and operation of Contractor's plant. Providing crossing areas for access to cut off businesses and structures. Provide and implement an occupational health and safety plan. Contractor to come up with a plan for	Contractor supervised by the Resident Engineer Appointed Health and Safety Officer	Included in Contractor's cost 50,000	Lumpsum Provisional

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		dealing with asbestos based on NEMA guidelines for approval by the RE. Appointing a trained occupational health and safety staff and fire marshal on-site for the duration of the construction work. Providing workers with appropriate personal protective equipment (PPE). Provide workers with adequate drinking water and breaks. Provide workers training on safety procedures and emergency response. Roads passing through population centers will be water sprayed to reduce dust. Work to minimize or altogether eliminate mosquito breeding sites. Provide a waste management plan. Cordon off trenches and working areas with a reflective tape to ensure safety of pedestrians and provide crossing areas for access to cut off businesses and structures. Providing clean toilets for workers, these toilets will be to World Health Organisation standards.		500,000 50,000 500,000 50,000 250,000 Included in air quality cost 50,000 5,000 Included in contractor's cost 300,000	Monthly Bi-annually Monthly Bi-annually Bi – annually Monthly Lumpsum
Construction	HIV & AIDS	Sensitizing workers and the surrounding	Contractor	75,000	Bi-annually

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	Impacts	communities on awareness, prevention and management of HIV/AIDS. Provide an on-site clinic to provide VCT services to construction crew and provision of ARVs for vulnerable community members	Appointed Health and Safety Officer Public Health Officer	50,000	Monthly
Construction	Gender empowerment	Ensuring equitable distribution of employment opportunities between men and women Providing toilets and bathrooms for both male and female workers on site	Contractor supervised by the Resident Engineer	Included in Contractor's cost Included in public health cost	
Construction	Service Delivery Impacts	Provide a traffic management plan which will provide alternative routes, traffic controllers, concrete barriers and speed limits for motorists. Communication any intended disruption of the services. Repair or facilitate the repair of any utilities that are interfered with during construction. Cordoning off trenches. Repair of any affected areas in consultation with the local authorities. Ensure pipelines are laid deep enough to prevent interference with the relevant road	Contractor MOWASCO County government KURA Relevant service provider	Included in traffic costs Included in contractor's cost 10,000 Included om contractor's cost	Monthly

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		sides, roads and walkways; and return reserve areas and road crossings to the state they were before construction.			
Construction	Crime Management	Fencing off the Contractor's camp with plant and materials. Working with local committees in addition to the Contractor's own security. Removing any employee who persists in any misconduct or lack of care, carries out duties incompetently or negligently, fails to conform to any provisions of the contract, or persists in any conduct which is prejudicial to safety, health, or the protection of the environment. Taking all reasonable precautions to prevent unlawful, riotous or disorderly conduct by or amongst the contractor's personnel. Prohibiting alcohol, drugs, arms, and ammunition on the worksite among personnel. Logging all events of a criminal nature that occur at the worksite or are associated with the civil works activities. Reporting all activities of a criminal nature on the worksite or by the contractor's	Contractor supervised by the Resident Engineer	Included in Contractor's cost	

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
		employees to the police.			
Construction	Child Labour and Protection	Provide and implement a child protection strategy Ensuring no children are employed on site in accordance with national labour laws Ensuring that any child sexual relations offenses among contractors' workers are promptly reported to the police	Contractor supervised by the Resident Engineer Local Administration	Included in contractor's cost	
Construction	Gender Equity, Sexual Harassment	Provide and implement a gender based violence strategy, which will include: Gender mainstreaming in employment at the worksite with opportunities provided for females to work, in consonance with local laws and customs Grievance redress mechanisms including non-retaliation. Provide and implement an employee code of conduct The works contractor should be required, under its contract, to prepare and enforce a No Sexual Harassment and Non-Discrimination Policy, in accordance with national law where applicable.	Contractor supervised by the Resident Engineer Local Administration	50,000	Lumpsum
Construction	Liability for loss of life,	Provision of PPE.	Contractor supervised by the Resident	Included in Contractor's	

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	injury or damage to private property	Training workers on the operation of the machinery and equipment Adequate warning and directional signs. Ensuring that the prepared code of conduct for staff is followed to prevent accidents. Developing a site safety action plan. Cordoning off unsafe areas Provision of first Aid kit within the construction site. Recording of all injuries that occur on site in the incident register, corrective actions for their prevention are instigated as appropriate. Compliance with the Workmen's Compensation Act, ordinance regulations and union agreements. Repairing any damage done to private property.	Engineer Appointed Health and Safety Officer	cost	
Construction	GRC Facilitation Costs	Locational GRCs will be set up to ensure all potential grievances are logged and resolved and will need a cost which will be included in the implementation costs	Contractor, RE and MOWASCO	1,500,000.00	Annually
Operation	Generation of solid	Provision of adequate waste disposal facilities.	MOWASCO		

Project Phase	**Environmental / Social Impact**	**Mitigation Measure**	**Responsibility**	**Cost (K.Shs.)**	**Frequency of Payments**
	waste	Implementation of the sanitation masterplan which includes.			
Decommissioning	Decommissioning of old pipelines	Provide a hazardous material management plan, especially the Asbestos Cement Pipes. Provide a waste management plan for all the removed pipelines	Contractor	500,000.00	
Decommissioning	Decommissioning of the Contractor's camp	Provide and implement a decommissioning plan including revegetation, disposal of waste material, and recycling of recyclable material.	Contractor	Included in the Contractor's cost	

8.3 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

The purpose of the Environmental and Social Monitoring Plan for the proposed project is to initiate a mechanism for implementing mitigation measures for the potential negative environmental impacts and monitor the efficiency of these mitigation measures based on relevant environmental indicators. The Environmental and Social Management Plan in Chapter 8.2 identified certain roles and responsibilities for different stakeholders for implementation, supervision and monitoring. The objectives of the monitoring plan therefore are:

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

Conversely, environmental monitoring provides feedback about the actual environmental impacts of the project. Monitoring results help judge the success of mitigation measures in protecting the environment.

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

Table 8-2 presents the indicators that will be used to monitor the implementation of the project. The indicators are selected based on the project and major anticipated impacts.

Table 8-2: Proposed Environmental and Social Monitoring Plan

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
Contractor's Camp	Public health and safety	• Prevalence rates of common diseases. • Provision of condoms, contraceptives and mosquito nets. • Conduction of campaign meetings on transmission of diseases like HIV/AIDS and other STDs. • Availability of adequate solid waste bins. • System of safe disposal of both solid and liquid waste in place. • Availability of first aid facilities. • Outpatient attendance registers. • Compliance with the Health and Safety Act.	• Physical inspection • Documentation Number of complaints • Interview with residents	Monthly	Environmental Supervisor	Investigate non-compliance and make recommendations Implement recommendations
	Solid and liquid wastes	• Presence of scattered litter. • Signs of obstruction of water courses.	• Physical inspection • Number of complaints.	Monthly	Environmental Supervisor Contractor	Implement recommendations
	HIV&AIDS	• Number campaign meetings on transmission of diseases	• Inspection of HIV/AIDS prevention services within	Quarterly	Contractor Environmental	Implement recommendations

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
		like HIV/AIDS and other STDs. • Number of condom dispensers within the site. • Number of ARVs provided to vulnerable persons	the site. • Number of condoms, ARVs provided.		Supervisor	
Project Site	Solid and liquid wastes	• Scattered litter • Signs of obstruction of water ways. • Flow of wastewater on the ground surface. • Provision of sanitary facilities to the construction crews. • Pollution of the Indian Ocean	• Physical inspection • Number of complaints • Measurement using annual and on the spot measurements	Monthly	Environmental Supervisor Contractor	Implement recommendations
	Noise	• Level of noise generated. • Provision of PPE. • Compliance with existing noise standard issued by NEMA.	• Liaise with other stakeholders. • Documentation on complaints about noise • Measurement using annual and on the spot measurements	Monthly	Environmental Supervisor	• Implement recommendations
	Air pollution	• Level of dust generated. • Provision of PPE.	• Physical inspection • Interview residents including workers	Monthly	Environmental Supervisor	• Implement recommendations

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
			• Liaise with other stakeholders • Measurement using annual and on the spot measurements			
	Flora and Fauna	• Amount of vegetation removed • Change in animal behavioural patterns	• Documentation of uprooted trees • Observation • Discussions with KWS	Quarterly	Environmental Supervisor	• Implement recommendations
	Gender Empowerment	• Number of female employees • Number of male and female toilets	• Review of company staff records. • Physical Inspection	Quarterly	Environmental Supervisor	• Implement recommendations
	Crime Management	• Number of reported crimes • Number of complaints	• Review of records • Interviews with staff and local community	Monthly	Environmental Supervisor	• Implement recommendations
	Child Labour	• Record of employees including IDs	• Review of records • Interviews with staff and local community	Monthly	Environmental Supervisor	• Implement recommendations
	Gender Equity and Sexual Harassment	• Number of complaints	• Review of grievance redress forms. • Interviews with local community	Monthly	Environmental Supervisor	• Implement recommendations
	Loss of Life, Injury and	• Record of accidents and damages done	• Review of records • Interviews with staff and	Monthly	Environmental Supervisor	• Implement recommendations

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
	Damage to Private property		local community.			

8.4 GRIEVANCE REDRESS MECHANISMS

The proposed project will slightly infringe on peoples' right to free movement within the project area, access routes, property or livelihood. Construction activities are bound to elicit grievances from the PAPs or from the general public. It is therefore imperative to have a workable grievance redress mechanism to take care of any such disputes arising from the construction works so that they do not have an adverse effect on the project.

In addition, to potential grievances from the general public or PAPs, potential grievances may occur within the Construction working environment may possibly bring out grievances within the Contractor's camp and work site among staff.

This chapter briefly outlines a mechanism for settling the anticipated disputes. This procedure will not replace the existing legal system for dealing with grievances, however the affected parties will be persuaded to use the proposed mechanism, and make use of the legal redress as a last resort at their own cost.

8.4.1 Possible Sources of Grievances

Some of the issues that may elicit disputes in the resettlement process include:

- Failure to understand the essence of the project and various impacts on livelihood, access routes, etc.
- Improper behaviour of the Contractor's staff
- Emerging issues such as unforeseen impacts
- Poor construction methods
- Accidents or Incidents with regards to the project
- Poor work environment and employee relations
- Injuries and compensation issues for affected staff members.

8.4.2 Parties and Committees Involved in the Grievance Redress Process and the Management Process

1) Grievance Redress Committee (GRC)

These committees will be based in each administrative location and the Nyali resident's association. It will be established by democratically through stakeholder consultative meetings chaired by the Contractor's CLO. S/he will be assisted by the locational chief, who is the government local representative at the location and will form a member of the committee. The GRC will act as the voice of the general public and local stakeholders, and will work under guidance and coordination of CLO in handling grievances. The GRC will be meeting in the local chief's office or the resident's association office and will be made up of:

- The locational Chief, who is the Government administrative representative at the locational unit and who deals with community disputes will represent the Government in the GRC of a Nyali Resident's Association Representative
- Assistant Chiefs, who support the locational Chief and Government in managing local community disputes in village units will form membership of the team.
- Female representative, elected by women stakeholders, will represent women and children related issues as regards resettlement and compensations
- Youth representative, elected by youths, will represent youth related concerns in the GRC

- Vulnerable persons representative, will deal and represent vulnerable persons issues in the GRC.
- Business representative, will represent business people concerns in GRC
- CBO representatives
- The Contractor's Community Liaison Officer

2) Site Office Committee

This will be a higher level committee that will sit monthly or when necessary and will be made up of:

- A representative of the Contractor's team (CLO)
- A representative from the RE's office (Environmentalist or Sociologist)
- A representative of the Client
- Three representatives from the GRC

3) Supervisor/Department Head

This individual oversees the day to day activities on the site of an activity for example concrete works, pipe laying, etc. with regards to grievances among staff the Supervisor will be the first recipient of a grievance from a staff member. Based on the severity of the grievance the Supervisor can solve it or escalate it to the Contractor's Human Resource Manager.

4) Contractor's Human Resource Manager

The Contractor's human resource manager will be in charge of the entire work force within the Contractor's camp. As such he/she will be in charge of the employment procedures, misconduct, conformance to labour laws and overall staff wellbeing, which includes second level grievances.

8.4.3 The Grievance Management Process

1) The Process for the General Public, Stakeholders and PAPs

The overall process of grievance management will be as follows:-

i. During the initial stages of the CLO will organize a public consultation meeting in order to select the members of GRC for each of the locations and resident associations. Following the selection of the committee members will be given copies of grievance procedures as a guide on how to handle the grievances. The GRC will pass the information to the rest of the community and stakeholders. The information will include who to contact (a phone number, address and location, time) as well as type of grievances they can refer to this committee. These procedures will be made available at the available Chief's office or resident association office where it can be distributed to the stakeholders.
ii. The process of grievance redress will start with registration of the grievances to be addressed for reference at the locational level through GRC. In all instances, records will be kept to enable progress updates of the cases.
iii. Traditional local mechanisms will be used and will include local leaders and the affected persons trying to find a solution with the concerned parties.
iv. In cases where a solution cannot be found at the locational GRC level reference will be made to the Site Office Committee.
v. These will ensure transparency, fairness, consensus building across cases, eliminate nuisance claims and satisfy legitimate claimants at low cost.

vi. The response time will depend on the issue to be addressed but all measures will be put in place to ensure efficiency,
vii. Once the grievance is addressed and agreement reached, the committees can mark the issue as addressed.

2) The Process for the Contractor's staff

i. Following the employment of the staff, each staff member will sign a copy of the Contractor's code of conduct and expectations from the Contractor.
ii. During the entire construction process, the employees will be divided into their working teams under the respective supervisor. The various teams will have daily and weekly staff meetings where workers can exchange views with the upper management through the supervisor and get feedback and expectations from their supervisors. During these meetings grievances can be aired and a resolution sought. If a solution is not available at this level, the grievance will be escalated to the Human Resource Manager. In addition, depending on the nature of the grievance, a staff member can approach the supervisor on an individual level.
iii. Records of the grievances, and their resolution or escalation will be included in the Supervisor's weekly report and kept in the Human Resource Office.

8.4.4 Grievance Redress Procedure

1) General Procedure

The Grievance redress will be the functions of the GRC and Site Office Committee. All the grievances will be channeled to the GRC. A grievance log will be established by Site Office Committee and copies of the records kept by both GRC and Site Office Committee to be used for monitoring of complaints.

The grievance redress mechanisms are designed with the objective of solving disputes at the earliest possible time which will be in the interest of all parties concerned and therefore implicitly discourages referring such matters to the law courts for resolution which would otherwise take a considerably longer time. If the GRC cannot adequately address the grievance, then reference will be made to the Site Office Committee who shall strive to address the grievances raised.

If a complaint pattern emerges, the Site Office Committee who will discuss and involve other relevant institutional stakeholders on possible remedial measures. Once they agree on necessary and appropriate changes, then a written description of the changed process will be made. MOWASCO, GRCs, Site Office Committee and the local leaders will be responsible for communicating any changes to the stakeholders and affected parties.

The procedure for managing grievances under will be as follows:

1) The affected person will file his/ her grievance, relating to any issue associated with the construction works in writing to the respective GRC, through a complaints box placed at the local chief's office (or Resident Association Office) or physically to a member of the GRC. The grievance note should be signed and dated by the aggrieved person. A selected member of the Committee will act as the Project Liaison Officer (PLO) who will be the direct liaison with affected party (ies).
2) The Contractor's Community Liaison Officer (CLO) will be working in collaboration with the other GRCs and Site Office Committee. Where the affected person is unable to write, the CLO will write the note on the aggrieved person's behalf. Any informal grievances will also be documented by the Project Liaison officer. The note should be

embossed with aggrieved person's signature or thumbprint. A sample grievance form is provided in the table below. A copy of this completed form should be submitted by the Community Liaison Officer to Site Office Committee.

Table 8-3: Table Showing a Sample Grievance Form

Reference No.	
Contact Information Please mark how you wish to be contacted (mail, telephone, e-mail)	Address: Telephone: - Email: -
Preferred Language for Communication (Please mark how you wish to be contacted)	English Kiswahili
National Identity Number	
Description of Incident or Grievance: What happened? Where did it happen? Who did it happen to? What is the result of the problem	
Date of Incident/ Grievance	
	One time incident/ grievance (date----------) Happened more than once (How many times--------) Ongoing (Currently experiencing problem…….)
What would you like see happen to resolve the problem?	

Signature: …… Date: …….

Please return this form to: COMMITTEE

3) The GRC will consult to determine the validity of claims. If valid, the Committee will notify the complainant that s/he will be assisted and a response will be given in the due time.
4) The GRC will meet and respond within 14 days during which time any meetings and discussions to be held with the aggrieved person will be conducted. During deliberations and based on the extremity of the complaint, the resolution might take a while during which the aggrieved person must be notified by the Project Liaison Officer that his/her complaint is being considered.
5) If the complainant's claim is rejected by the Committees, the Community Liaison Officer will assist the aggrieved person to take the matter to the Site Office Committee. The Site Office Committee will look at the complaint raised by the aggrieved party and provide direction, explanation and a response. Sometimes, it will necessitate the aggrieved person to present him or herself to the Site Office Committee to explain him/herself. All efforts will be made to try and reach some consensus with the complainant.
6) If the aggrieved person does not receive a response or is not satisfied with the outcome by Site Office Commitettee within the agreed time, s/he may lodge his/her grievance to the County NEMA Office, also mandated to help resolve such matters). If requested, or deemed necessary by the, the Community Liaison Officer will assist the aggrieved person in this matter.
7) Where the matters cannot be resolved through local routes, the grievance will be referred to the NEMA tribunal. The Site Office Committee will provide assistance at all stages to the aggrieved person to facilitate resolution of their complaint and ensure that the matter is addressed in the optimal way possible.

After the process, a grievance resolution form will be filled in order to document the resolution made. A sample of the form is provided below:

Table 8-4: Sample of a Grievance Resolution Form

Sample Grievance and Resolution Form

Name (Filer of Complaint): _____

ID Number: _____ (PAPs ID number)

Contact Information: _____ (Village; mobile phone)

Nature of Grievance or Complaint:

_____

_____

_____

Date	**Individuals Contacted**	**Summary of Discussion**
_____	_____	_____

Signature_____ Date: _____

Signed (Filer of Complaint): _____

Name of Person Filing Complaint :_____(if different from Filer)

Position or Relationship to Filer: _____

Review/Resolution

Date of Conciliation Session: _____

Was Filer Present? : Yes No

Was field verification of complaint conducted? Yes No

Findings of field investigation:

_____

_____

_____

Summary of Conciliation Session

Discussion: _____

_____

_____

Issues _____-

_____

Was agreement reached on the issues? Yes No

If agreement was reached, detail the agreement below:

If agreement was not reached, specify the points of disagreement below:

_____

___

Signed (Conciliator):_____ Signed (Filer): _____

Signed: _____ Date: _____

The Community Liaison officer will ensure that each complaint has an individual reference number, and is appropriately tracked and recorded actions are completed. This will be done via a grievance log which will also contain a record of the person responsible for an individual complaint, and records dates for the following events:

- ⊕ Date the complaint was reported;
- ⊕ Date the grievance log was uploaded onto the project database;
- ⊕ Date information on proposed corrective action sent to complainant (if appropriate);
- ⊕ The date the complaint was closed out; and
- ⊕ Date response was sent to complainant.
- ⊕ Nature and type of grievances being raised

The entire grievance redress procedure can be sumarised in the figure below

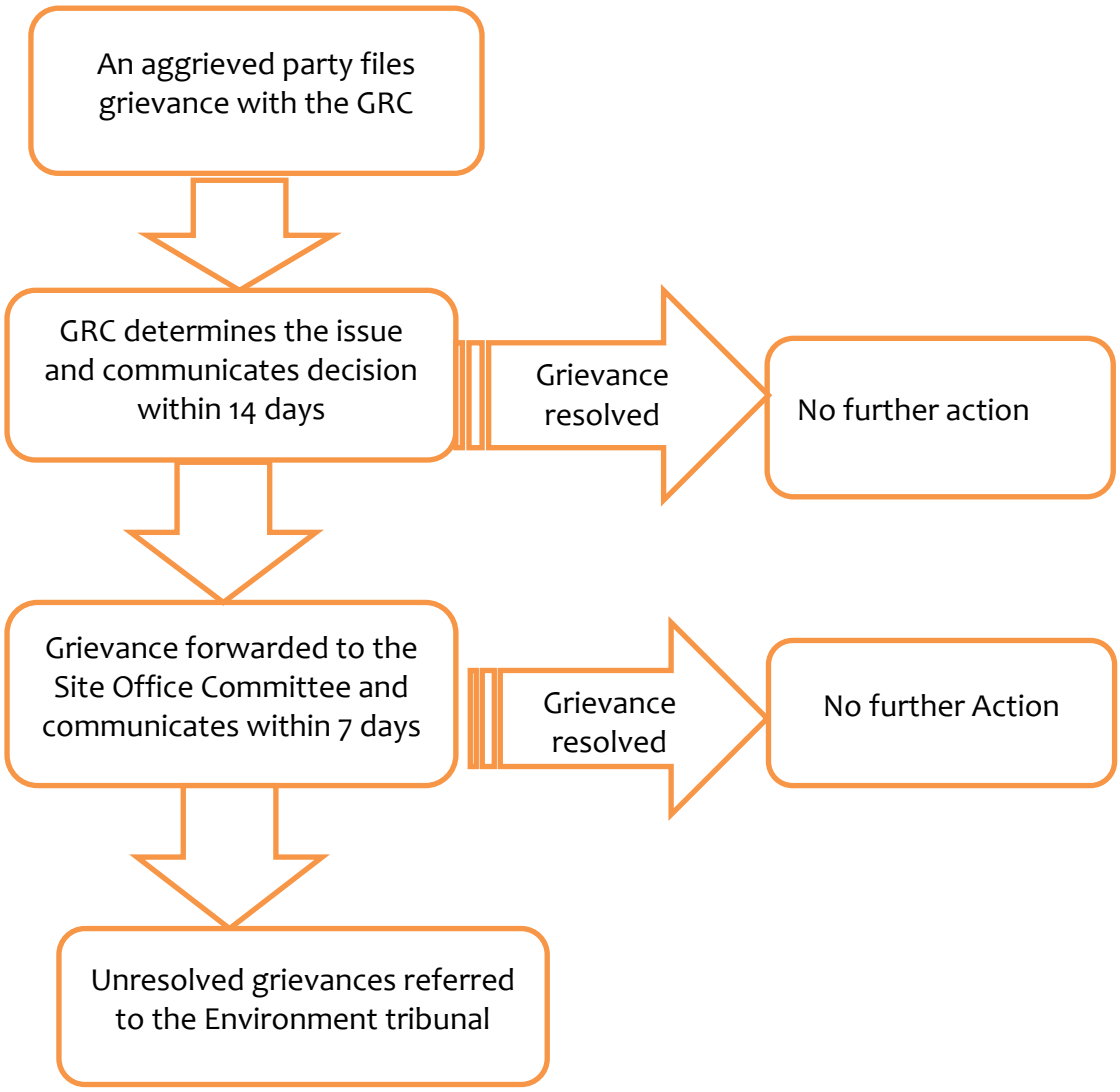


Figure 8-1: Figure Showing the Dispute Resolution Procedure

2) Staff Procedure

Grievances among the Contractor's staff will be the responsibility of the supervisors and the Human Resource Manager.

These mechanisms are designed with the objective of solving disputes at the earliest possible time which will be in the interest of all parties concerned and therefore implicitly discourages referring such matters to the law courts for resolution which would otherwise take a considerably longer time.

If a complaint pattern emerges, the Human Resource Manager will discuss and involve the company managers and attempt to mitigate these occurences.

The procedure for managing grievances under will be as follows:

i. Whenever any staff feels that he/she has been treated unjustly or has any information/complaint regarding another staff or company operations; he/she should first seek an audience with the immediate supervisor/departmental head.
ii. The immediate supervisor and/or departmental head may solve the matter on their own or report it to the Human Resource department for consultation and direction on the matter.
iii. The staff is at liberty at any stage to appeal/report to the Human Resource department through the County Employee Relations Office and is not obligated to immediately report to the direct supervisor.
iv. The decision taken will be communicated to the staff concerned. If the matter is still unresolved, his/her complaint should go to the Managing Director, through the head of Human Resource Department.

Records of the complaints will be initially made by the supervisor in his/her weekly reports and kept in the human resources department as well as measures undertaken to resolve the grievances.

The internal grievance redress process is summarized in the figure below:

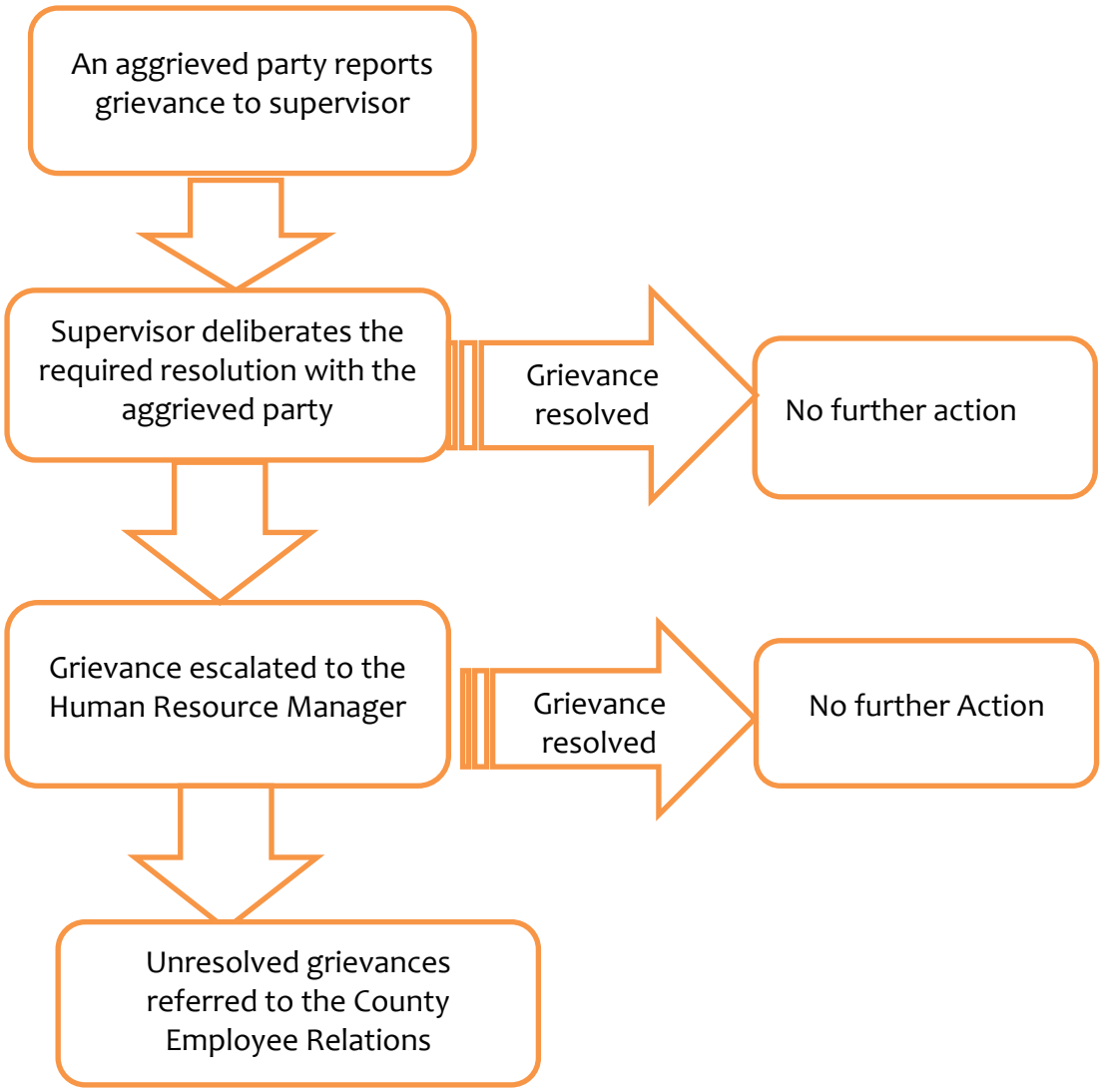


Figure 8-2: Internal Grievance Redress Procedure

8.4.5 GRC Costs

The Cost of administration of the GRCs will be met by the Contractor and has been included in the Environmental and Social Management Plan provided in Table 8-1 above

8.5 INSTITUTIONAL FRAMEWORK FOR IMPLEMENTATION OF THE ESMP

The organizational structure elaborates on the role of various stakeholders in administering the ESMP. It further clarifies the role of PAPs and stakeholders and their responsibility in the exercise in relation to ESIA. The table below shows the various institutions and their role in the implementation of the ESMP.

Table 8-5: Institutional Framework for ESMP

Name of Institution	Role of Institution
Ministry of Water and Sanitation	Will be an overall implementing agency. Central agency responsible for holding all information

	on the ESIA and RAP. Mobilization of financial resources from Government/ County Governments for resettlement and compensation purposes of the approved ESIA and RAP.
Kenya Water Security and Climate Resilience Program (KWSCRP)	Program under the Ministry of Water and Sanitation in the implementation of the project. Represent the ministry in the project.
MOWASCO	Responsible for day to day coordination and implementation of the project. Oversee the contractor's work Seek approval from NLC for the acquisition of way leave. Assist in the establishment of the GRCs and Site Office Committee. Establish the GRCs and Site Office Committee operations. Ensure the grievance committees are established and working. Monitor the ESMP implementation.
NEMA	Provide approval of the ESIA report Review and provide a NEMA license for the ESMP. Escalate unsolvable grievances to the tribunal.
Site Office Committee	Ensure effective flow of information between the Contractor and public Coordinate GRCs and assist in resolution of escalated grievances Coordinate activities between the various institutional stakeholders and the general public. Conducting extensive public awareness and consultations with the aggrieved parties so that they can air their concerns, interests and grievances.
Grievance Redress Committee (s) (GRC)	Conduct extensive public awareness and consultations. Help ensure that local concerns raised by stakeholders as regards environmental and social issues among others are promptly addressed by relevant authorities. Resolve manageable disputes that may arise. If it is unable to resolve, help refer such grievances to the Site Office Committee. Ensure that the concerns of vulnerable persons such as the disabled, widowed women, orphaned children

	affected by the project are addressed and included.
Supervisor/Department Head	Oversees the day to day activities on the site of an activity. First recipient of a grievance from a staff member. Based on the severity of the grievance the Supervisor can solve it or escalate it to the Contractor's Human Resource Manager.
Contractor's Human Resource Manager	The Contractor's human resource manager will be in charge of the entire work force within the Contractor's camp. As such he/she will be in charge of the employment procedures, misconduct, conformance to labour laws and overall staff wellbeing, which includes second level grievances.
County Employee Relations	Receive unresolved complaints from employees Establish the legality of the complaint Provide a resolution on unresolved complaints in accordance to the various laws

9 CONCLUSIONS AND RECOMMENDATIONS

As has been alluded in this report, the following can be said in summary.

The implementation of the proposed improvements on the distribution network in Nyali area in Mombasa North Mainland will be a major step in improving the water infrastructure in preparation for the completion of Mwache Dam as well as reduce Non-Revenue Water in the project area. In addition, following the different projects aimed at augmenting the water supply in Mombasa North Mainland (Increase of wells at the Baricho Wellfield), the improved infrastructure in Nyali will convey the increased water to the residents of Nyali, before the completion of Mwache Dam.

The negative impacts identified in this ESIA during the planning, construction, operation and decommissioning phase of the project, including waste generation, air pollution, noise pollution, occupational health and safety impacts, community health and safety impacts, traffic, labour influx and gender impacts will be limited to the pipeline wayleaves and can be mitigated using the measures proposed in the ESMP as well as the preparation and implementation of safeguard policies including but not limited to:

i. Waste Management Plan
ii. Labour influx strategy
iii. Gender based violence plan
iv. Child protection strategy
v. Employment plans
vi. Occupational Health and Safety Plan
vii. Traffic Management Plan
viii. Decommissioning Plan
ix. Hazard Material Management Plan

Other plans to aid the implementation of the safe project implementation can be included as the project continues.

In addition the recommendations of the public consultation and participation was incorporated into the findings of this report, some of the major issues addressed in the public participation include non-revenue water, water shortages and high bills, will be addressed after the implementation of the project and the construction of Mwache Dam.

The ESIA concludes that although the full positive environmental benefits will not be felt until the Mwache Dam is implemented, however the short term benefits will also be beneficial in the supply of water in the new pipelines from the augmented supply to Mombasa and the reduced water losses through old defunct pipelines.

The adverse impacts on the physical and natural environment will be “in sum total,” not significant, and can be handled through the recommended mitigation measures. There are incremental costs required to achieve these. Compensation for demolition of structures, fences, trees, lawns and livelihoods will be done through a detailed Resettlement Action Plan which is provided under a separate report.

10 REFERENCES

Republic of Kenya, Environmental Management and Coordination Act (EMCA, Cap 387), Government Printer, Nairobi

Republic of Kenya, Water Act (2016), Government Printer, Nairobi

Republic of Kenya, Public Health Act, Cap 242, Government Printer, Nairobi.

The Constitution of Kenya 2010

The Land Act, No. 6 of 2012

International Finance Corporation and World Bank Environmental, Health and Safety (EHS) Guidelines

Mombasa County Masterplan

Reduction of non-revenue water and improvement of quality and sustainability of water services provided by MOWASSCO, Design of North Mainland Water supply by Vitens Evides International

Background of Selection of Measures for Immediate Measures by Mangat I.B. Patel

Detailed Design Report for Immediate Measures under the Waste Water Design Masterplan by Mangat I.B. Patel

World Bank Operational Policies

IFC EHS Guidelines

Coast Women in Development website

11 APPENDICES

11.1 APPENDIX A SURVEY QUESTIONNAIRE

Zamconsult Consulting Engineers

PROPOSED MOMBASA NORTH MAINLAND.WORKS CONTRACTS, UNDER KENYA WATER SECURITY & CLIMATE RESILIENCE PROGRAM (KWSCRP) FOR THE MINISTRY OF WATER AND SANITATION

ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT SURVEY QUESTIONNAIRE

An Environmental and Social Impact Assessment Survey is being carried out for the **proposed works to improve the water services in Mombasa North Mainland, under the Ministry of Water and Irrigation is being carried out by Zamconsult Consulting Engineers**. The aim of this survey is to form a realistic and up to date picture of the Environmental and Social situation in the area. We need your honest and accurate information during this discussion. Your inputs will assist in the understanding of your needs for improvement. The answers you provide will be kept confidential.

SECTION 1 DETAILS

1.1 Name of the Enumerator: .....

1.2 Signature of the Enumerator: .....

1.3 Name of the Respondent.....

1.4 Telephone number of the respondent..... ID Number of the respondent.....

1.5 Date: ..... Time of Interview: .....

1.4 Respondent place of resident: (1) Estate..... (2) Street .....

(3)Location -..... (4) County.....

SECTION 2 BASIC HOUSEHOLD SETUP

2.1 Name of the household head? .....

2.2 ID Number of the household Head..... Telephone Number of the Household Head.....

2.3 How many members do you have in this household.....

2.4 How many members of your household fall under each of the following age groups?

(1) 0 – 5yrs..... (2) 5 – 18yrs..... (3) 19-35yrs..... (4) 36-49yrs.....

(5) 49-65yrs..... (6) Over 65yrs .....

2.5 How many of your household members have attained each of the following education levels?

(1) None ..... (2) Primary ..... (3) Secondary ..... (4) College/university .....

2.6 What is the occupation /economic activity of the household head

(1) Formal employment ..... (2) Business ..... (3) Work in the informal sector.....

(4) Crop farming ..... (5) Livestock farming ..... (6) Fishing ..... (6) Others (specify) .....

2.7 If crop farming what type of crops? (1) Maize..... (2) Cashew nuts ..... (3) Cassava.....

(4) Mangoes ..... (5) Beans..... (6) Coconut..... (7) Others.....

2.8 If livestock farming what animals?

Proposed Improvements to Water Supply in Mombasa North Mainland Page 1

(1) Cow..... (2)Sheep ..... (3)Goats..... (4) Donkeys ..... (5) Others .....

2.9 If business what kind of business? (tick) (1) Shop ..... (2) Bodaboda (bicycle /motorbike).....

(3) M-Pesa..... (4) Jua kali ..... (5) Grocery ..... (6) Others (specify) .....

2.10 What is the average combined household income per month? (tick) (1)Less than 15,000..... (2) 15,000-30,000..... (3)30,000-50,000..... (4) Above 50,000 .....

2.11 What's the religion of the Household Head? (tick) (1)Christian..... (2) Muslim..... (3) Hindu..... (4) Traditionalist ..... (5) Others Specify .....

2.12 Type of fuel mostly used for cooking: (tick)

(1)Firewood ..... (2)Charcoal ..... (3) Kerosene ..... (4) LPG(Gas) .....

(5)Electricity ..... (6) Others (specify) .....

SECTION 3 WATER AND SANITATION

3.1 What is the source of your domestic water?

(1) Private tap connection from MOWASCO..... (2) Public Tap ..... (3) Bore hole .....

(4) Shallow well ..... (5) Water Vendor ..... (7) Others (specify) .....

3.3 What is the general quality of the water? (Tick)

(1) Good ..... (2) Fair ..... (3) Bad .....

3.4 How often do you Receive/Fetch water?

(1) Every day ..... (2) Every alternate day of the week ..... (3) Once a week ..... (4) Monthly ..... (5) Irregularly .....

3.5 Is the water Supply source adequate (Tick)

(1) YES..... (2) NO.....

3.6 If you fetch water, how far is this water source in km? .....

(1) Less than 0.2km ..... (2) 0.2 -1km..... (3) 1– 2km ..... (4) Above 2km.....

3.7 What is the ownership status of the water source? (Tick)

(1)Public ..... (2) Faith based ..... (3)Private ..... (4) NGO ..... (5) Other (specify) .....

3.8 Do you pay for water (1) Yes..... (2)No.....

3.9 (a) If yes, what is your Monthly bill?

(1) K.Shs. 0-1,000 ..... (2) K.Shs. 1,001 – 5,000 ..... (3) Above K.Shs. 5,000

3.9 (b) If yes how much per 20 litre jerrican in Ksh.

(1) Ksh. 2..... (2) Ksh. 5 ..... (3) Ksh. 10..... (4) Above Ksh. 10 .....

3.10 What challenges do you face with regards to domestic water supply?

(1) Irregular Water supply ..... (2) Inadequate quantities of water ..... (3) Physical fatigue due to travelling for long distances in search of water ..... (4) Others (specify) .....

3.11 How do you dispose of your household waste? (Tick)

(1)Compost pit/burying ..... (2) Collection by the county ..... (3) Recycling .....

(4) Burning ..... (5) Dumping in open areas ..... (6) Others (specify) .....

3.12 Does the household have a toilet?

(1)Yes ..... (2) No .....

3.13 If yes, type of toilet: (tick)

(1) Flush system connected to the sewer line ..... (2) Flush system with Septic tank .....

(3)Pit latrine ..... (4) Mobile toilet ..... (5)Any other (Specify) .....

3.14 Are you aware of the proposed Works under KWSCRP?

(1) YES ..... (2) NO .....

3.15 How will proposed Works under KWSCRP affect the community here? (Tick)

(1) Positively ..... (2) Adversely (negatively).....

3.16 If positively, in what way? (Tick)

(1) Reduced time and cost of travel to look for water.....

(2) Reduced cases of waterborne diseases..... (3) Improved hygiene.....

(4) Improved business ..... (5) Growth of town with water supply .....

(6) Reduced livestock diseases..... (7) Employment for the youth ..... (8)Alleviate water shortages..... (9) Others (please specify) .....

3.17 If negatively, in what ways? (Tick)

(1) Dust and noise ..... (2) Demolition of structures ..... (3) Loss of /trees/crops ..... (4) Soil erosion ..... (5) Interruption of services (water, electricity, transport) ..... (6) Spread of diseases (STD, HIV/AIDS)..... (7) Others (specify) .....

3.18 What do you think should be done to minimize or mitigate these negative impacts?

(1) Inform the public about any interruption of services .....

(2) Install storm water drains ..... (3) Avoid night time construction ..... (4) Educate the public and the construction crew on health and safety..... (5) Compensate the structure/Land /crop/trees owners..... (6)Others (specify).....

SECTION 4 HEALTH.

4.1 Which diseases have members of your household suffered from in the past six months? (Tick)

(1)Malaria ..... (2)Malnutrition ..... (3)Measles ..... (4)HIV/AIDS .....

(5)Eye problems ..... (6)Diarrhea ..... (7) Cholera ..... (8) Intestinal worms .....

(9)Respiratory infections ..... (10)Skin rashes ..... (11)Others (specify) .....

4.2 What do you do when you are sick?

(1)Seek medical attention from a health centre..... (2)Prayed for ..... (3)Take herbs..... (4) Visit a traditional doctor..... (5)Buy medicine directly from a pharmacy ..... (6) Others (specify) .....

4.3 What is the ownership status of the health facilities attended by your household members? (Tick)

(1)Public ..... (2) Private ..... (3) Faith based ..... (4) NGO ..... (5) Traditional .....

4.4 How far is the health facility visited by your household members in km?

(1) Less than 1km ..... (2) 1 -3km..... (3) 3 – 5km ..... (4) Above 5km.....

SECTION 5 KNOWLEDGE AND ATTITUDE ON HIV/AIDS

5.1 Have you ever heard of HIV/AIDS? (1) Yes ..... (2) No .....

5.2 If yes, what source did you hear it from? (Tick)

(1) Radio/TV ..... (2) Billboards ..... (3) Posters ..... (4) Religious leaders ..... (5) Relative/friend ..... (6) Health worker/Clinic..... (7) NGO/CBOs ..... (8) Newspaper ..... (9) Other (Specify) .....

5.3 Has any of your household members been affected by HIV/AIDS? (1)Yes..... (2)No .....

5.4 Do you think HIV (AIDS) can be prevented? (1)Yes ..... (2) No ..... (3) Do Not Know .....

5.5 Do you know where to go for voluntary counseling and testing for HIV/AIDS?

(1)Yes ..... (2) No .....

SECTION 6 ENVIRONMENTAL

6.1 What environmental issues are of concern to the people of this area?

(1) Water shortage ..... (2) Invasive species ..... (3) Limited sewerage facilities ..... (4) Extinction of endangered species ..... (5) Mosquitoes and malaria spread ..... (6) Solid waste ..... (7) Encroachment into road reserves ..... (8) Drought ..... (9) Others (please specify).....

6.2 What are the environmental conservation initiatives in the area?

(1) Tree planting ..... (2) Educating the public ..... (3) Cleaning of mosquito breeding sites .....

(4) Collection of solid wastes..... (5) Onsite sewage treatment..... (6) Others (please specify) .....

6.3 Who are carrying out these activities?

(1) Women groups ..... (2) County council..... (3) Non-governmental organization ..... (4) Community based organizations..... (5) Individuals..... (6) Youth groups..... (6) Others (please specify) .....

6.4 Will the completion of the proposed Works under KWSCRP help in the conservation of the environment in the area? (1) Yes ..... (2) No .....

6.5 If yes in what ways? .....

11.2 SUMMARY OF PUBLIC AND STAKEHOLDER CONSULTATION

11.2.1 Minutes of the Kick off Meeting Held on 16th January 2018 at KWSCRP Nairobi Offices at 3pm

1) *Present*
   - Eng. Simon G. Mwangi – Project Manager; KWSCRP (Chairman)
   - Lazarus Kubasu – Social specialist; KWSCRP
   - Eng. S. Musyoka – Engineer; KWSCRP
   - Anthony Kiluku – Project Engineer; KWSCRP
   - Eng. Dr. Zablon Oonge – MD; Zamconsult Consulting Engineers
   - Marion Orina – Civil & Environmental Engineer; Zamconsult Consulting Engineers
   - Dr. Joseph Misati – Social Development Expert; Zamconsult Consulting Engineers
   - Dr. David Siriba – Surveyor and GIS specialist; Zamconsult Consulting Engineers
   - Margaret Mbugua – Environmental Engineer; Zamconsult Consulting Engineers
   - Dr. Owiti K'Akumu – Valuer; Zamconsult Consulting Engineers
   - Abok Kefa – Valuer; TTR
   - Peter Obiero – Business manager; TTR
2) *Agenda*
   - Introduction of the Consultant's team to the client
   - Presentation of the works carried out to date (including the inception report)
3) *Minutes*

Minute No.	Item	Action
01/05	**1. Introduction of Members Present** The Chairman welcomed the participants to the meeting stating that KWSCRP had several projects in the coast region. He then invited the participants to introduce themselves. He expressed positivity in the implementation of the ESIA and RAP in the North Mainland, however advised the Consultant to closely work with MOWASCO and the design consultant in order to reduce excess resettlement by the pipeline.	ALL
02/05	**2. Consultant's presentation on works to date** The Consultant then proceeded to give a presentation on the works carried out to date. These included: 1. Mobilisation of all staff members 2. Presentation of the Inception report 3. A desktop study of the proposed project features 4. An appreciation of the project area	CONSULTANT

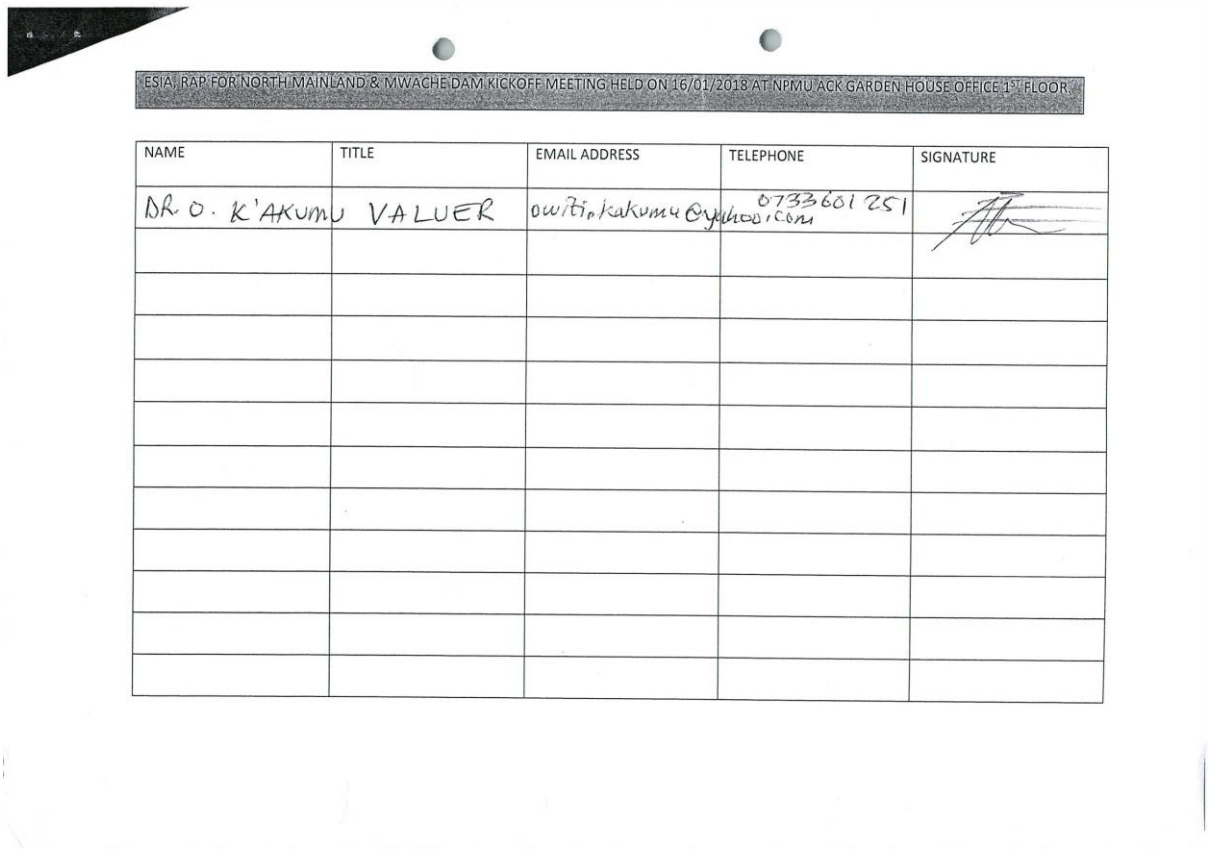
Minute No.	Item	Action
	In addition the Consultant assured the Client that they were on hand to work together so as to establish a cost effective RAP.	
03/05	**3. <u>Matters Arising</u>** Following the presentation the following were the matters arising: 1. The Client pointed out that the pipelines in Nyali were an existing network and the proposed works involved either replacing some of the lengths along the pipelines or decommissioning others. In addition no land acquisition was foreseen for this project, however leases for the wayleaves would be considered if the unlikely need arises. 2. The Client also explained that the replacement of utilities, road crossings, driveways, culverts and verandas would be included in the Contractor's works contract as such the costs should not be included in the RAP. However the Consultant would still identify these assets so as to have an estimate for the works contract. 3. It was discussed that the World Bank was very keen on livelihood restoration measures particularly low income areas such as Kongowea. The Consultant stated that they would keenly look into this 4. Due to the difficulty in placing beacons along road reserves, The Consultant pointed out that they would map the proposed wayleave as well as any proposed changes using GIS. 5. The Client also pointed out that the some areas within Nyali were middle to high income earning areas, as such the residents may not be willing to attend public consultation barazas as such a new approach would have to be decided upon. The Consultant agreed and stated that they would look into contacting resident associations as part of the public consultation. 6. The Client pointed out that any correspondence with the Client should be addressed the Project Manager. The Consultant noted the observation. 7. Finally the Client assured the Consultant that they would be on hand every step of the way as such the Consultant should continuously liaise with the members of KWSCRP, MOWASCO and the KWSCRP project management unit for successful implementation of a cost effective RAP. The Client further pointed out that they would be on hand to make any changes in the design if the resettlement issues were too extreme in some cases. In the interest of continuous liaison with all key	CLIENT & CONSULTANT

Minute No.	Item	Action
	stakeholders it was proposed to have a meeting in Mombasa to meet the key stakeholders and get a go ahead to proceed with the field work.	
04/05	**4. AOB** The proposed meeting in Mombasa was set for Tuesday the 23rd January at the KWSCRP PMU offices in Mombasa. The Client stated that the date would be confirmed at a later date	ALL
05/05	**5. Close of Meeting** There being no other business. The meeting ended at 4.00pm	ALL

Meeting's Attendance List

ESIA, RAP FOR NORTH MAINLAND & MWACHE DAM KICKOFF MEETING HELD ON 16/01/2018 AT NPMU ACK GARDEN HOUSE OFFICE 1ST FLOOR.

NAME	TITLE	EMAIL ADDRESS	TELEPHONE	SIGNATURE
Simon G. Mwangi				[illegible]
LAZARUS KUBASU	Social Specialist	LKubasu@kwscrp.org	0724881380	[illegible]
Dr. ZABLON OONGE	M.D. ZAMCONSULT	oongezi@gmail.com	0720801680	[illegible]
Marion Orina	Civil & Environmental Engineer	marionorina@gmail.com	0720 806 583	[illegible]
Dr. Joseph Misati	Sociologist	josephmisati@yahoo.com	0726493984	[illegible]
Dr. David Siriba	Surveyor	dnsiriba@gmail.com	0721 100332	[illegible]
Margaret Mbugua	Environmental Eng.	wangariephantus@yahoo.co.uk	0721122354	[illegible]
Eng S. Musyoka	Engineer	smusyoka@kwscrp.org	0723005234	[illegible]
Anthony Kiluku	Projects Eng PMU	akiluku@kwscrp.org	0720711659	[illegible]
[illegible]	Valves	[illegible]	0721-[illegible]	[illegible]
Peter Otieno	Business Manager TTR	[illegible]@gmail.com	0720655364	[illegible]



ESIA/ RAP FOR NORTH MAINLAND & MWACHE DAM KICKOFF MEETING HELD ON 16/01/2018 AT NPMU ACK GARDEN HOUSE OFFICE 1ST FLOOR

NAME	TITLE	EMAIL ADDRESS	TELEPHONE	SIGNATURE
DR. O. K'AKUMU	VALUER	owiti.kakumu@yahoo.com	0733601251	

11.2.2 Minutes of the Kick off Meeting held on 23rd January 2018 at KWSCRP Mombasa Offices at 11am

1) *Present*
   - Martin Ngaa – Mombasa Unit Manager; KWSCRP (Chairman)
   - Lazarus Kubasu – Social specialist; KWSCRP
   - Mwero Mkalla – Safeguards expert, PMU Coast
   - Eng. Dr. Zablon Oonge – MD; Zamconsult Consulting Engineers
   - Eng. Meshack Saboke –Director; Zamconsult Consulting Engineers
   - Marion Orina – Civil & Environmental Engineer; Zamconsult Consulting Engineers
   - Dr. Joseph Misati – Social Development Expert; Zamconsult Consulting Engineers
   - Dr. David Siriba – Surveyor and GIS specialist; Zamconsult Consulting Engineers
   - Margaret Mbugua – Environmental Engineer; Zamconsult Consulting Engineers
   - Dr. Owiti K'Akumu – Valuer; Zamconsult Consulting Engineers
2) *Absent With Apologies*
   - MOWASCO team
3) *Agenda*
   - Introduction of the Consultant's team to Mombasa Client
   - Introduction of the Consultant to Mombasa Stakeholders (MOWASCO)
   - Preparation for field work and what to expect

4) Minutes

Minute No.	Item	Action
01/07	**1. Introduction of Members Present** The Chairman welcomed the participants to the meeting, expressing the sincere apologies from the MOWASCO team lead by Mr. Kombe, who had to attend to an urgent matter. He explained that the discussions held in during the meeting would be shared with the MOWASCO team. Further Mr. Kubasu stated that the meeting had initially been slotted for 2.00pm, however due to the attendance of the Consultant and Client before time and the absence of the MOWASCO team, the meeting would proceed at 11.00am. The chairman then invited the participants to introduce themselves.	ALL
02/07	**2. Chairman's Expectations of the Consultant** The chairman explained to the attendees what was expected in carrying out the ESIA and RAP for the proposed project. 1. Pointed out that the PAPs should not be given unrealistic expectations with regards to compensation. In addition he expressed concerns over additional PAPs cropping up during the project implementation. The Consultant explained that there would be a cut-off date established in the RAP. In addition, the RAP would put in place verification measures in order to ensure that the correct PAPs and their assets would be identified. 2. Avoidance of permanent structures by the pipeline if it doesn't affect the hydraulic design of the pipelines. He added that the design engineer had offices in Nyali and would be available for discussions on any pipeline route changes. 3. Inclusion of World Bank policies on ESIA and RAP, which should take precedence. 4. Inclusion of the stakeholders (MOWASCO, County government, KWSCRP) during the public consultation meetings. The Consultant stated that the stakeholders would be notified in advance of the proposed meetings so as to include them.	CONSULTANT
03/07	**3. Safeguards expert, PMU Coast's expectations of the Consultant** The Safeguards expert invited the Consultant to Mombasa, stating that their office was happy to help with the implementation of the ESIA and RAP. He had the following expectations: 1. He stated the importance of involving political,	

Minute No.	Item	Action
	administrative and local leaders before conducting fieldwork. These leaders would be gatekeepers into the communities within the project area. Ensuring their awareness of the project will ensure seamless field work.	CONSULTANT
04/07	**4. <u>Social specialist's expectations of the Consultant</u>** The social specialist reiterated the comments of the previous KWSCRP staff stating that: 1. Notices should be given to all stakeholders on all proposed public consultation meetings beforehand. 2. The Nyali area would need a different approach for public consultation. He added that residential associations could be used for setting up meetings. 3. The Consultant should meet with the design engineers and consult with them continuously on any alignment changes. 4. The Consultant will be in charge of proposing members of the grievance committees. 5. The Consultant should obtain copies of cadastral maps in the project area so as to establish the proposed pipeline routes in relation to any private land.	CONSULTANT
05/07	**5. <u>Matters Arising</u>** Following the expectations the following were the matters arising: 1. The Consultant made a request for introduction letters for use in the field. The Client stated that these would be provided. 2. The Client stated that no land acquisition was foreseen, hence the need for the cadastral maps to establish this.	CLIENT & CONSULTANT
06/07	**6. <u>AOB</u>** It was proposed that MOWASCO should receive a copy of these minutes, and could meet with the team coming onsite for field work. In addition it was agreed that the Consultant would provide an itinerary of the proposed field work to the PMU so as to facilitate planning.	ALL CONSULTANT
07/07	**7. <u>Close of Meeting</u>** There being no other business. The meeting ended at 12.45pm	ALL

Meeting's Attendance List

23.01.18.

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
Martin Ngoa	Unit Manager / Mombasa Kwscrp	0725144565	martin.ngoa@gmail.com	
LAZARUS KOBASU	Social Specialist, NPMU	0724881380	lkubasu@kwscrp.org	
OA KAKUMU	VALUER, ZAMCONSULT	0733601257	owiti.kakumu@gmail.com	
D.N. SIRIBA	SURVEYOR, ZAMCONSULT	0721100332	dnsiriba@gmail.com	
JOSEPH MISATI	SOCIOLOGIST, ZAMCONSULT	0726493984	Josephmisati@Yahoo.com	
MARGARET MBUGUA	ENVIRONMENTAL ENGINEER	0721122354	margaretmbugua@yahoo.co.uk	
Marion Orina	Civil & Environmental Engineer Zamconsult	0720806583	marionorina@gmail.com	
M. M. SABEKE	Water Engineer, ZAMCONSULT	0733766141	mmsabeke2244@yahoo.com	
Zakdon Oonge	MD ZAMCONSULT	0720801680	zamconsultltd@gmail.com oongezi@gmail.com	
MWERO MKALLA	SAFEGUARDS PMU – COAST	0722-390642	mmkalla@kwscrp.org	

11.2.3 Minutes of a Consultation meeting Held with the Nyali Administration on 14th February 2018 at 9.00am at the Nyali Sub-County Offices

1) *Present*
   - Joseph Marete – Nyali Sub-County Deputy County Commissioner
   - Etyang James Collins – Nyali Sub-County Assistant County Commissioner
   - Yasmin Lavoga – Ag. Chief Kongowea
   - Bernard Omollo – Assistant Chief Maweni
   - Millicent Dzombo – KWSCRP
   - Dennis Mutai - MOWASCO
   - Marion Orina - Zamconsult Consulting Engineers (Consultant)
   - Margaret Mbugua - Zamconsult Consulting Engineers (Consultant)
   - Joseph Makheti - Zamconsult Consulting Engineers (Consultant)

2) *Minutes*

Minute No.	Item	Action
01/06	**1. Introduction of Members Present** The Chairman welcomed the participants to the meeting, expressing that Mombasa (North Mainland Included) were facing a major water shortage, and any water project would be of assistance.	ALL

Minute No.	Item	Action
	The chairman then invited the participants to introduce themselves.	
02/06	**2. <u>Overview from KWSCRP Representative</u>** The chairman handed the meeting over to the KWSCRP representative. The representative gave an overview of KWSCRP in the country as well as its operations in order to meet its core mandate. She explained that the project being carried out currently was the Mwache Dam and related infrastructure. The related infrastructure she explained was improvement of pipelines and storage facilities in the county. She then pointed out that both Kenyan and international laws required an ESIA and RAP. She stated that the Consultant was there to carry out both activities. Finally she invited the MOWASCO representative to give an overview of the project features.	KWSCRP
03/06	**3. <u>Overview from MOWASCO Representative</u>** The MOWASCO representative gave an overview of the proposed improvements in the Nyali area, stating that the works were a priority project, since majority of the pipelines were constructed in the colonial periods, some of which were made out of asbestos. He explained that the pipelines were located in Nyali area, from Nakumatt cinemax to Kongowea and the new Malindi Highway. He pointed out that due to various developments in the area, some of the pipelines will be rerouted in order to ensure that all pipelines would be located within the road reserve. He then invited the Consultant to give an overview on the ESIA and RAP	MOWASCO
04/06	**4. <u>Overview from the Consultant</u>** The social specialist reiterated the comments of the KWSCRP representative stating that, their role in the project was carrying out an ESIA and RAP for the proposed aspect. She pointed out that it was important to look into the social and environmental impacts of the proposed works and come up with mitigation measures. She highlighted the importance of stakeholder consultation in the ESIA and RAP process. She explained that the local communities needed to have a say in the best methods for implementing the project, proposal of additional mitigation measures as well as ensuring buy in for the project. She stated that this meeting with the leaders in the county was	CONSULTANT

Minute No.	Item	Action
	one of the key steps to beginning the consultation process. In addition she explained that there was going to be a baseline data collection exercise on going in the area for the next weeks in order to have an understanding of the environmental and social characteristics of the area and its people.	
05/06	**5. Matters Arising** Following the discussions the following were the matters arising: 1. The Deputy County Commissioner requested that the more pipelines be included in the more informal settlements. The MOWASCO representative stated that the pipelines being done in this project were only the priority works, the company was still working hard to improve the infrastructure in the area in general.	ALL
06/06	**6. Close of Meeting** There being no other business, the meeting ended at 10.30 am with the administration assuring the consultant that all support would be given for the successful implementation of the project.	ALL

Meeting's Attendance List

THE WORLD BANK
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REPUBLIC OF KENYA
MINISTRY OF WATER AND IRRIGATION
KENYA WATER SECURITY & CLIMATE RESILIENCE PROJECT
ATTENDANCE LIST

MEETING: INTRODUCTION OF NYALI RAP CONSULTANTS DATE 13/2/2018

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
Joseph Makleti	Zam Consult, Surveyor	+254789210154	Joewadiye@gmail.com	
Millicent Dzombo	KWSCRP	0736057314	mdzombo@kwscrp.org	
Dennis Mutai	MOWASSCO	0729281641	d.mutai@mombasawater.co.ke mtadeniso@gmail.com	
Margaret Mbugua	Zam Consult - Environmentalist	0721122354	wangaiephantus@yahoo.co.uk	
Marion Orina	"	0720806583	marionorina@gmail.com	
Benard Omollo	Asst Chief Mwakirunge	0710788571	benardomollo@gmail.com	
Yasmin Lavoga	Ag Chief-Kongowea	0729010391	Yasminlavoga@gmail.com	

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
ESTHER JAMES COLLINS	M.I.C.N.G	0706934199	joysmith.jc@gmail.com	
JOSHUA MARETE	INTEGRITY & COORD.	0722227096	dongoli@gmail.com	

11.2.4 Minutes of a Consultation meeting Held with the Nyali Ward Administrators on 14th February 2018 at 11.00am at the Nyali Constituency Offices

1) *Present*
   - Evans Mwamuye – Ag. Sub-county Administrator & Ward Administrator Kongowea (Chairman)
   - Petro Okodo – Ward Administrator Mkomani
   - Hellen Keera – Ward Administrator Frere Town
   - Irene Muraguri – Ward Administrator Ziwa la Ng'ombe
   - Dennis Okwara – Ward Administrator Kongowea
   - Elma Mponda – County government of Mombasa
   - Millicent Dzombo – KWSCRP
   - Dennis Mutai - MOWASCO
   - Marion Orina - Zamconsult Consulting Engineers (Consultant)
   - Margaret Mbugua - Zamconsult Consulting Engineers (Consultant)
   - Joseph Makheti - Zamconsult Consulting Engineers (Consultant)

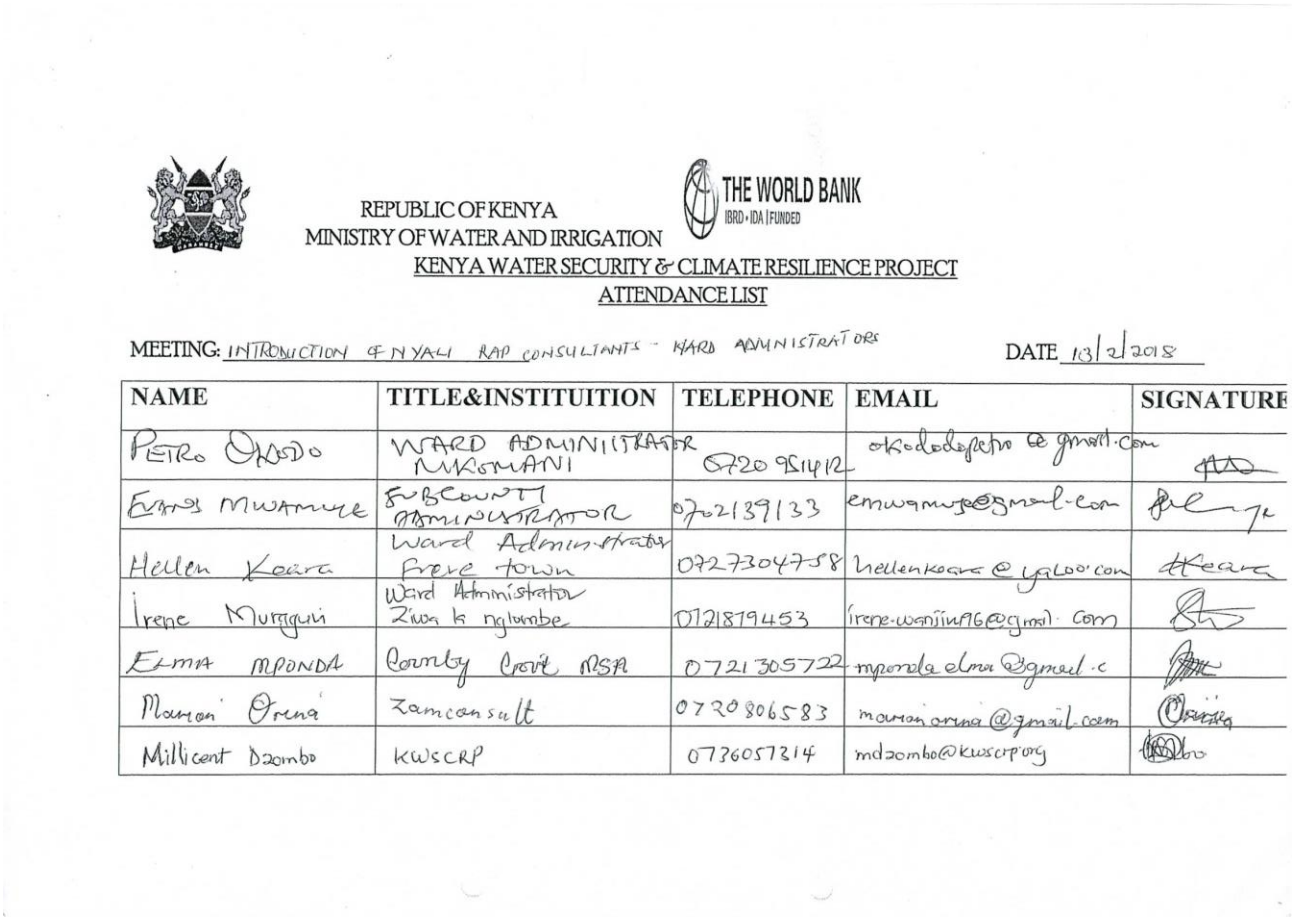
2) *Minutes*

Minute No.	Item	Action
01/06	**1. Introduction of Members Present** The Chairman welcomed the participants to the meeting, expressing the great need for water due to inadequate supply in the area.	ALL

Minute No.	Item	Action
	The chairman then invited the participants to introduce themselves.	
02/06	**2. <u>Overview from KWSCRP Representative</u>** The chairman handed the meeting over to the KWSCRP representative. The representative gave an overview of KWSCRP in the country as well as its operations in order to meet its core mandate. She explained that the project being carried out currently was the Mwache Dam and related infrastructure. The related infrastructure she explained was improvement of pipelines and storage facilities in the county. She then pointed out that both Kenyan and international laws required an ESIA and RAP. She stated that the Consultant was there to carry out both activities. Finally she invited the MOWASCO representative to give an overview of the project features.	KWSCRP
03/06	**3. <u>Overview from MOWASCO Representative</u>** The MOWASCO representative gave an overview of the proposed improvements in the Nyali area, stating that the works were a priority project, since majority of the pipelines were constructed in the colonial periods, some of which were made out of asbestos. He explained that the pipelines were located in Nyali area, from Nakumatt cinemax to Kongowea and the new Malindi Highway. He pointed out that due to various developments in the area, some of the pipelines will be rerouted in order to ensure that all pipelines would be located within the road reserve. He then invited the Consultant to give an overview on the ESIA and RAP	MOWASCO
04/06	**4. <u>Overview from the Consultant</u>** The social specialist reiterated the comments of the KWSCRP representative stating that, their role in the project was carrying out an ESIA and RAP for the proposed aspect. She pointed out that it was important to look into the social and environmental impacts of the proposed works and come up with mitigation measures. She highlighted the importance of stakeholder consultation in the ESIA and RAP process. She explained that the local communities needed to have a say in the best methods for implementing the project, proposal of additional mitigation measures as well as ensuring buy in for the project. She stated that this meeting with the leaders in the county was	CONSULTANT

Minute No.	Item	Action
	one of the key steps to beginning the consultation process. In addition she explained that there was going to be a baseline data collection exercise on going in the area for the next weeks in order to have an understanding of the environmental and social characteristics of the area and its people.	
05/06	**5. <u>Matters Arising</u>** Following the discussions the following were the matters arising: 1. The Ward Administrator from Frere Town wanted to know why the Kisauni side was left out in the project. The MOWASCO representative stated that the pipelines being done in this project were only the priority works, the company was still working hard to improve the infrastructure in the area in general. 2. The Ward Administrator Mkomani requested that jobs for the local youth be provided. The Consultant stated that their recommendations would be included in the ESIA report, further adding that the baseline data collection would be carried out by local youth as such the opportunities had already begun. 3. The ward administrators wanted to know if there would be compensation for any affected assets. The consultant explained that the RAP was being conducted so as to establish potential PAPs, who would be compensated based on their losses. 4. The ward administrators also requested for corporate social responsibility with regards to the vulnerable in the community.	ALL
06/06	**6. <u>Close of Meeting</u>** There being no other business, the meeting ended at 12.00 noon with the ward administrators assuring the consultant that all support would be given for the successful implementation of the project.	ALL

Meeting's Attendance List



REPUBLIC OF KENYA
MINISTRY OF WATER AND IRRIGATION
THE WORLD BANK IBRD • IDA | FUNDED
KENYA WATER SECURITY & CLIMATE RESILIENCE PROJECT
ATTENDANCE LIST

MEETING: INTRODUCTION OF NYALI RAP CONSULTANTS - WARD ADMINISTRATORS DATE 13/2/2018

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
PETRO OKODO	WARD ADMINISTRATOR MKOMANI	0720 951412	okodopetro@gmail.com	
EVANS MWAMUYE	SUBCOUNTY ADMINISTRATOR	0702139133	emwamuye@gmail.com	
Hellen Koora	Ward Administrator Frere Town	0727304758	hellenkoora@yahoo.com	
Irene Murigui	Ward Administrator Ziwa la ngombe	0721879453	irene.wanjiru96@gmail.com	
ELMA MPONDA	County Govt NSA	0721305722	mponda elma@gmail.c	
Marion Orina	Zamconsult	0720806583	marionorina@gmail.com	
Millicent Dzombo	KWSCRP	0736057314	mdzombo@kwscrp.org	

11.2.5 Minutes of a Consultation meeting Held with the North Coast Residents' Association on 14th February 2018 at 2.00pm at the Coral Lane

1) *Present*

- Francis Rua – Member (Chairman)
- Galyne Onyimbo – Member
- Lindsay Nichols - Member
- Annemarie de Jong - Member
- Shaheen Yakub - Member
- Penny Holding - Member
- Millicent Dzombo – KWSCRP
- Dennis Mutai - MOWASCO
- Marion Orina - Zamconsult Consulting Engineers (Consultant)
- Margaret Mbugua - Zamconsult Consulting Engineers (Consultant)
- Joseph Makheti - Zamconsult Consulting Engineers (Consultant)

2) *Minutes*

Minute No.	Item	Action
01/06	**1. Introduction of Members Present** The Chairman welcomed the participants to the meeting. The chairman then invited the participants to introduce	

Minute No.	Item	Action
	themselves.	ALL
02/06	**2. <u>Overview from KWSCRP Representative</u>** The chairman handed the meeting over to the KWSCRP representative. The representative gave an overview of KWSCRP in the country as well as its operations in order to meet its core mandate. She explained that the project being carried out currently was the Mwache Dam and related infrastructure. The related infrastructure she explained was improvement of pipelines and storage facilities in the county. She then pointed out that both Kenyan and international laws required an ESIA and RAP. She stated that the Consultant was there to carry out both activities. Finally she invited the MOWASCO representative to give an overview of the project features.	KWSCRP
03/06	**3. <u>Overview from MOWASCO Representative</u>** The MOWASCO representative gave an overview of the proposed improvements in the Nyali area, stating that the works were a priority project, since majority of the pipelines were constructed in the colonial periods, some of which were made out of asbestos. He explained that the pipelines were located in Nyali area, from Nakumatt cinemax to Kongowea and the new Malindi Highway. He pointed out that due to various developments in the area, some of the pipelines will be rerouted in order to ensure that all pipelines would be located within the road reserve. He then invited the Consultant to give an overview on the ESIA and RAP	MOWASCO
04/06	**4. <u>Overview from the Consultant</u>** The social specialist reiterated the comments of the KWSCRP representative stating that, their role in the project was carrying out an ESIA and RAP for the proposed aspect. She pointed out that it was important to look into the social and environmental impacts of the proposed works and come up with mitigation measures. She highlighted the importance of stakeholder consultation in the ESIA and RAP process. She explained that the local communities needed to have a say in the best methods for implementing the project, proposal of additional mitigation measures as well as ensuring buy in for the project. She stated that this meeting with the leaders in the county was	CONSULTANT

Minute No.	Item	Action
	one of the key steps to beginning the consultation process. In addition she explained that there was going to be a baseline data collection exercise on going in the area for the next weeks in order to have an understanding of the environmental and social characteristics of the area and its people.	
05/06	**5. <u>Matters Arising</u>** Following the discussions the following were the matters arising: 1. The residents raised concern on the sustainability of the project, stating that the major issue in the area was the maintenance of the existing infrastructure. The MOWASCO representative explained that the company was undergoing capacity building in order to fully handle the project. 2. The residents also wanted to know if the issue of Non-Revenue Water in the area, particularly in the informal settlements would come to an end. They highlighted the need for more stringent action against those that made use of illegal connections. The MOWASCO representative explained that one core aspect of this project was reduction of non-revenue water. He added that the area would be divided into DMAs to cut down the occurrence of the NRW. 3. The Residents requested for a solution for damage to pipes by neem trees in the area. The Consultant stated that an option would be included in the ESIA report. But most likely the affected trees would have to be cut down, however others would be replanted in a more suitable area. 4. The residents requested a schedule of works for the ESIA and RAP field work in order to be available to answer the necessary questions. The Consultant stated that a copy of the schedule would be sent to the association's email.	ALL
06/06	**6. <u>Close of Meeting</u>** There being no other business, the meeting ended at 4.00pm with the residents thanking the Consultant for the meeting and hoping there would be another once the reports were compiled. The Consultant assured them that another meeting with the findings of the ESIA and RAP would be held.	ALL

Meeting's Attendance List

REPUBLIC OF KENYA
MINISTRY OF WATER AND IRRIGATION
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ATTENDANCE LIST

MEETING: NORTH COAST RESIDENTS ASSOCIATION / NEW NYALI RESIDENTS ASSOCIATION DATE 13/2/18

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
x Galyne Onyimbo	New Nyali Residents Ass	0722128491	newnyaliresident@gmail.com	[signature]
Lindsay Nicholls	North Coast Residents & Ratepayers Ass.	0724 044099.	linicholls.lu@gmail.com	[signature]
Annemarie de Jong	North Coast Residents & Ratepayers member	0724053450	ankenya@gmail.com	[signature]
x Rina Franke	NNRRA	0780001379	nnrra.nyali@gmail.com	[signature]
Shaheen Yakub	New Resident	0716 050500	shaheen.yakub@gmail.com	[signature]
Penny Holding	NCRRA	C/o NCRRA		[signature]
Marian Orina	Zamconsult Consulting Engineers	0720806583	marian orina@gmail.com	[signature]

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
Joseph Makheti	Zam Consult Consultants	+254729210154	Joewachiye@gmail.com	[signature]
Millicent Dzombo	KWSCRP	0736057314	mdzombo@kwscrp.org	[signature]

11.2.6 Minutes of a Stakeholder Meeting Held with MOWASCO on 3rd March 2018 MOWASCO Offices

1) *Present*

- Mr. Francis Kombe - MD MOWASCO and the Chief Officer DWNR
- Mwero Mkalla - KWSCRP representative
- Sarah Langat - MOWASCO
- Olwa - MOWASCO
- Tiberius Atuti - Zamconsult Consulting Engineers (Consultant)
- Margaret Mbugua - Zamconsult Consulting Engineers (Consultant)

2) *Minutes*

Minute No.	Item	Action
01/05	**1. Introduction of Members Present** The KWSCRP representative thanked the MD, MOWASCO for being available and allowing a meeting in the office out of his busy schedule. He invited the participants to introduce themselves.	ALL
02/05	**2. Overview from KWSCRP Representative** The representative gave an overview of KWSCRP in the country as well as its operations in order to meet its core mandate. He explained that the project being carried out currently was the Mwache Dam and related infrastructure. He informed them that the consultant was on site to carry out an ESIA and RAP. He requested MOWASCO to take the front line in the project implementation as the project as the project will eventually be handed over to MOWASCO to do the water distribution. He invited the consultant to give an overview of the RAP activities.	KWSCRP
03/05	**3. Overview from the Consultant** The Consultant explained that a Resettlement Action Plan was being carried out in order to identify all the project affected persons (PAPs). Fortunately, the pipelines project intended to stick within the road reserve hence very few people would be identified as PAPs since there was minimal encroachment within the road reserve area. She informed them that the affected would be mapped using GPS with an accuracy of 1metre in UTM coordinate system. She outlined that the cut-off date for the RAP exercise was 19th of February 2018. She added that the project affected persons would be treated following the correct procedures to ensure seamless transitions and resettlement.	Consultant
04/05	**4. Overview from the MD, MOWASCO** He urged the consultant to organize for public consultations meeting with the residents. He recommended for consultations	

Minute No.	Item	Action
	to be held with key stakeholders and the general public within the project area, to ensure that all stakeholders were aware of and had accepted the project. He said it was important to win the people through disermination of information to avoid any kind of resistance. He said lack of proper public consultation derails a project. He highlighted kong'owea, matopeni, Shauri yako, kisimani and mkomani as areas that needed proper public consultation. He requested the Consultant team to consult the MOWASCO team to ensure the RAP exercise was done properly.	CONSULTANT & KWSCRP
05/05	**5. Close of Meeting** There being no other business, the meeting ended at 4.00pm with the Consultant assuring them that public consultation meetings would be held with immediate effect.	ALL

11.2.7 Minutes of a Consultation meeting Held at Ziwa la Ng'ombe, Mwavila Grounds on 3rd March 2018 at 10.00am

1) *Present*

- Margaret Mbugua - Zamconsult Consulting Engineers (Consultant)
- Millicent Nzombo - KWSCRP representative
- Irene Muraguri – Ward Administrator
- Benard Omolo – Assistant Chief, Ziwa la Ng'ombe
- Tiberius Atuti- Zamconsult Consulting Engineers (Surveyor)
- Kennedy Mwadime - MOWASCO representative
- Other leaders and General Public

2) *Minutes*

Introductions

The meeting started at 10.15am with a word of prayer by Reverend Francis Kyalo. The meeting was chaired by the area chief, who introduced the Consultant to the attendees. He then invited the Consultant and KWSCRP staff to give their presentation.

Presentation on Project by the KWSCRP staff

The KWSCRP staff madam Millicent informed the people that the project was intended to alleviate the water problems in Mombasa. She said that the Mombasa north mainland project was a component of the Mwache dam project and once completed there would be enough water for Mombasa residents. She said the existing water supplies are limited and the government in collaboration with the world bank has considered the construction of the said dam and the laying down of pipes that would accommodate the water. She informed the people that the construction of the dam would commence by the end of the year and the laying of pipes was ongoing at Likoni and Mombasa West Mainland would follow and then Mombasa North Mainland. The old asbestos pipes would be replaced.

Presentation on Project by the consultant

The Consultant gave a presentation of the proposed project, its scope, and the laws governing the Environmental and Social Process as well as the need to conduct public consultation meetings.

She explained that the project involved replacement of the old pipes and as well as extension of the pipes network by putting up new pipelines. She informed them that the project would be maintained within the road reserve.

The Consultant explained the various impacts associated with the project, throughout the project duration (planning, construction, operation and decommissioning, including possible resettlement of Project Affected Persons (PAPs). The Consultant explained that a Resettlement Action Plan was being carried out in order to identify all the project affected persons (PAPs). Fortunately, the pipelines project intended to stick within the road reserve hence very few people would be identified as PAPs since there was minimal encroachment within the road reserve area. She informed them that the affected would be mapped using GPS with an accurancy of 1metre in UTM coordinate system. She outlined that the cut-off date for the RAP exercise was 19th of February 2018. As such, any further developments within the project site would not be considered for compensation.

The Consultant also explained that a RAP verification process would be done by KWSCRP before any negotiations/compensation can be done.

Questions, Answers and Feedback

The Consultant then invited the attendees to raise whatever issues they had, in order to have full knowledge on the project.

Q1) Mr. Mwandime inquired if the price of water in the water kiosks would reduce since the quantity of water would increase. He said the residents were buying water at 20 shillings per 20litre jerrycan and that water was a business that was enriching a few individuals.

The MOWASCO representative responded by stating that once the new project was completed the price of water would decrease. He further informed them that those who were licensed to sell water were supposed to sell the water at two shillings for twenty litre jerrycan. He said the license clearly states that water is two shillings per twenty litre jerrycan. He requested the residents to be vigilant and report the water kiosk owners who were exploiting them.

Q2) Mr. Harib Khirib commented that the things that affect people were health, peace, food, and water. He said water is life and nobody should be allowed to exploit other people. He said the issues of water should be put first as the people were really suffering.

The consultant responded by stating that currently, the water supply for Mombasa was inadequate but that with the implementation of the proposed project the water problem would be addressed. She informed them that with the completion of the project people would be able to connect water to their homes and nobody will be able to exploit them again.

Q3) Mr. Alex Kimwene requested to know exactly which pipes were being replaced since there were three types of pipes and some were recently laid. He said the reason people were being overcharged for water was because the kiosk owners were required to pay MOWASCO though they receive water once or twice a week stating that there was standing charges that had to be paid with or without water.

The consultant stated that the water pipes that were being replaced were the old pipes, the old and dilapidated pipes for bulk water supply. She said other pipes for distribution would remain. CWSB is for bulk water supply while MOWASCO is for distribution of water. She stated further that MOWASCO operates in conjunction with the county in implementing its duties. She further said the issue of people being overcharged will be addressed once and for all with the completion of the project.

Q4) Reverend Francis said they already had pipes and inquired whether the pipe sizes would be increased. He said there was a project by the government that constructed toilets, but these toilets are never used because of lack of water and inquired to know whether the toilets will become operational. He also inquired whether demolition of the structures will be before or after compensation.

The MOWASCO representative informed the people that individual pipes to homes would not be replaced as the project was concerned with the bigger pipes for bulk supply. He said the toilets were closed because of lack of water but once there was water they would become operational. The KWSCRP representative informed the people that demolition of structures will be after compensation. She said the contractor will start works after the affected persons had been compensated.

Q5) Mr. Joram said that the village elders were not in a position to force the water kiosk owners to sell water at two shillings and requested for assistance. He inquired to know who would be responsible for repair of personal lines that would be affected by the trenching. He said in the past there was a water main that was broken by a contractor and water spilled for days. He also recommended water kiosks to help those unable to pipe water to their homes.

The consultant stated that the contractor should repair any pipes broken during construction and encouraged the people to address such complaints immediately to the grievance redress mechanism (chief, resident engineers etc.) as long as these pipes are not illegal connections. Furthermore, she stated that water kiosks were not part of the mandate of the project hence issues of water kiosks to be addressed by MOWASCO since that was the organization dealing with operations. However, the consultant would propose the recommendations in their report to KWSCRP. The MOWASCO representative informed the people that any water kiosk owner reported for selling water at a higher price will have their license cancelled. He said he was aware of the main pipe that had been cut by the contractor and that the contractor had repaired the pipe and was also supposed to pay for the water lost.

3) Conclusion

The Consultant stated that she would forward all the people's comments, feedback and recommendations to the relevant authorities. She also stated that she would include all that was discussed in the meeting in her report. she requested the people to inform others about the RAP exercise. In addition, it was concluded that the people had accepted the project and that it was long overdue.

The Chief thanked everyone for attending the meeting and requested that the youth should be given jobs during the project construction phase. He thanked the consultant for engaging the youth in data collection. He said he will organize a meeting for the MOWASCO representative since most of the questions were being addressed to MOWASCO.

The ward administrator thanked the people in attendance and the government for the project. He requested the people to educate others about the project and the PAPs identification exercise.

The KWSCRP representative also requested the people to be good ambassadors for the project.

4) Close of Meeting

The meeting ended at 12.30pm with a word of prayer.

5) Meeting's Attendance List

	NAME	ORGANIZATION	KITAMBULISHO	SIMU	SIGN
1	Benard Omolo	Asst Chief	14669473	0707555 71	[illegible]
2	Joram Migwi	V/EL	547948	[illegible]	
3	Samuel Kasanga	V/Elder	2251429	0711195555	[illegible]
4	ESTHER KASUSE	V/Eldar	3956734	0721977687	Kasuse
5	MTAWALI K. KIFIMBE	V/Elder	2266508	0705623078	[illegible]
6	KAKA Charo Bunga	V/Elder	2150353	0711873602	KAKA
7	Mohamed Halid	V/Elder	4618457 4618 4818	0721388875	
8	Irene Murguri	Ziwa la Ng'ombe Ward Administrator	21782692	0721879253	[illegible]
9	Sammy S. Tangai	Kicodef	9204136	0721709480	[illegible]
10	Rev FRANCIS MENZA MWAMBAO	RELIGOUS LEADER	2158511	0711259662	[illegible]
11	SWALEH ABDALLA	SETTLEMENT EX. COMMITTEE	6732469	0725222541	[illegible]
12	HAMISI MANGALE MENZA	V/ELDER	4633024	0734391608	[illegible]
13	DORINE MAMBORI	MOTHER LEADER	23359564	0711489559	[illegible]
14	AGNES JUMWA	COMMUNITY POLICING	36179026	0703159455	[illegible]
15	SHADRACK K. JOHN	Mzee wa Nyumba kumi	3690070	0720023547	[illegible]
16	MEJUMAA ATHUMAN	YOUTH	30986495	0704331549	[illegible]
17	Ngoi Kumwele	SEC	9277220	0721347870	[illegible]
18	N.A. KAZUNGU	KAHINDI		0788768978	
19	HESBON ALFAYO	KIDOGO BASI	10022696	0727813374	[illegible]
20	SAUMU Hulfu	KIDOGO BASI	5395573	0713878143	[illegible]
21	RACHEL M. MBUNGA	IDD KUMBI	3930592	0721159014	
22	ATHMAN HASSAN	KISIMANI	1361807	0726344919	
23	STEPHEN K. BAYA	Ziwa la ngombe	11457746	0728175124	
24	Anthony Kaniudi	Ziwa la ng'ombe	33806402	0703814683	[illegible]
25	Rose K. MENGO	MAWENI IDDI	2246455	0702524729	[illegible]
26	Salma Rubea	IDD Kumbi	1361872	072013810	[illegible]
27	Fatuma Nyule	Mkunguni	3907962		Fatum
28	Mohamed Mabawa Ali	Ziwa la Ng'ombe	41226974	0721681188	[illegible]
29	Bethseba Anyango	Mwembeni	21272085	0716269536	[illegible]
30	Anne Kahuya Viregwa	Ziwa La Ng'ombe	32021764	0725279458	[illegible]
3	[illegible]	[illegible]		[illegible]	
31	Amina Habada Zukaria	Kambi ya moto	3419448	0724264968	A.H

NAMES	OGANIZATION	ID NO.	CONTACT NO.	Sign
32 VIGILANCE MGANGA	V/Elder	2250407	0712664361	[illegible]
33 Duncan Sanga	Youth	33787527	0791449296	[illegible]
34 JANE MUENI	SEC	6067968	0722749731	[illegible]
35 Tima Ali	Youth		0729405365	Tima
36 ROBERT BOGOSHA	V/ELDER	0504349	07117798[illegible]	[illegible]
37 HASSAN Bababa		31026090	0711435381	[illegible]
38 WAYNA MASIKU	CHV	10323991	0711296301	WAYNA
39 Eike Kazungu		30720296	0729031455	
40 Galyne Chyimba	ANILA	14642244	0722128497	
41 BORRIS HWAERA		24190481	0729897312	
42 ELIJAH KANOTI M	V/Elder	4566358	0713205044	[illegible]
43 JUMANNE KANOTI	YOUTH	33862884	0792608063	[illegible]
44 KASIWA HA	BALOZI	21757929	0725930608	[illegible]
45 MARY SIBI KAZUNGU		21736469	0717322624	[illegible]
46 ELIZABETH Mwanajuma Swede		33221538	0727829215	[illegible]
47 Ruth A.C. Bakari	V/Elder	226676	0700451723	[illegible]
48 ISSIMAIKA AHU MAN BALUSA	USIMAN		0781114533	[illegible]
49 Nyagah Kenike	BALOZI	11872837	0710135311	Tomi
50 ERNEST MRISA	E/CBO ASS chaim	12490888	0714466590	[illegible]
51 Julius Minge		30636234	0790813916	[illegible]

LIST OF ATTENDANCE

	NAME	ORGANIZATION	KITAMBULISHO	SIMU	SIGN
52	DENNIS KALUNDE CHIRRO	V/ELDER	16018482	0727454446	[signature]
53	Ricky Onyango	Resident	29403718	0722860632	[signature]
54	John Mzey	Resident	32161902	0711883858	[signature]
55	Juma dosa	Police C	11871585	0722352	[signature]
56	Said Swaleh	P.C	0509021	0722822499	[signature]
57	Joyce Munbi	[illegible]	53923449	0723070	[signature]
58	NAHSHON GAMBO	[illegible]	10305926	0713059415	
59	Mulliced Dzombo	KWSCRP	27609374	0736073	[signature]
60	Margaret Wangari	ZamConsult	11418334	0721122	[signature]
61	Tiberius Atuti	Zamconsult	29776296	07020283	[signature]
62	Kennedy Mwadime	MOWASSCO	13709408	0722288	[signature]
63	HAMISI ERRISA	21 wa	26028858	0713060	[signature]
64	ERNEST MRISA	C.B.O Chairman	12490888	0744466590	[signature]
65	Irene Awour	mKomani	34607576	0714062574	[signature]
65	Aisha Ali	ziwa la ngombe	32840581	0707528860	[signature]
66	Kelvin Kijumba	Resident	28755608	0704433263	[signature]
67	~~Timothy Koome~~				
67	Timothy Koome	ZamConsult	25276970	0726534616	[signature]
68	Brian Nyaranga	Resident	34643541	0727369770	[signature]

11.2.8 Minutes of a Consultation meeting Held at Kongowea Chiefs Camp on 7th March 2018 at 11.00am

1) *Present*

- Yasmin Lavoga – Assistant Chief, Kongowea
- Mr Dennis Okwara - Ward Administrator
- Millicent Nzombo - KWSCRP representative
- Mwero Mkalla - KWSCRP representative
- Margaret Mbugua - Zamconsult Consulting Engineers (Consultant)
- Dr. Misati - Zamconsult Consulting Engineers (Consultant)
- Other leaders and General Public

2) *Minutes*

Introductions

The meeting started at 11.30am with the chief welcoming everyone. She thanked the people for attending the meeting saying it meant a lot for her as it was a sign that she was serving them well.

She requested Pastor Samuel to open the meeting with a word of prayer. She requested the people present to introduce themselves and excused herself as she was to attend another meeting.

Presentation on Project by the KWSCRP staff

The KWSCRP staff Mr. Mkalla informed the people that the sources of water for Mombasa were limited. He noted the Marere pipeline, Baricho, and Mzima pipeline saying their water supply was inadequate. He said the proposed project was intended to alleviate the water problems in Mombasa.

He said that the Mombasa north mainland project was a component of the Mwache dam project and once completed there would be enough water for Mombasa residents. He informed them that the dam would be 87m high,400m wide and 1.5km long He said the existing water supplies are limited and the government in collaboration with the world bank has considered the construction of the said dam and the laying down of pipes that would accommodate the water.

Presentation on Project by the consultant

The Consultant gave a presentation of the proposed project, its scope, and the laws governing the Environmental and Social Process as well as the need to conduct public consultation meetings.

She explained that the project involved replacement of the old pipes and as well as extension of the pipes network by putting up new pipelines. She informed them that the project would be maintained within the road reserve.

The Consultant explained the various impacts associated with the project, throughout the project duration (planning, construction, operation and decommissioning, including possible resettlement of Project Affected Persons (PAPs). The Consultant explained that a Resettlement Action Plan was being carried out in order to identify all the project affected persons (PAPs). Fortunately, the pipelines project intended to stick within the road reserve hence very few people would be identified as PAPs since there was minimal encroachment

within the road reserve area. She informed them that the affected would be mapped using GPS with an accurancy of 1metre in UTM coordinate system. She outlined that the cut-off date for the RAP exercise was 19th of February 2018. As such, any further developments within the project site would not be considered for compensation.

The Consultant also explained that a RAP verification process would be done by KWSCRP before any negotiations/compensation can be done.

Questions, Answers and Feedback

The Consultant then invited the attendees to raise whatever issues they had, in order to have full knowledge on the project.

Q1) Pastor Samuel inquired if the grievance committee would have people from the area as they were in better positions to identify those who are real PAPs.

The KWSCRP representative informed them that the affected persons would comprise the committee. He said there were two types of committees the committee for compensation and the grievance redress committee. He adviced them that when time comes to choose the committee members they should avail themselves so that they choose the right people. He said it is very important to attend mettings so that whatever decision are madde you are part and parcel.

Q2) Mr. Charles requested to know whether the dam water would be supplied entreated or whether there would be a treatment plant.

The consultant informed the people that there would be a treatment plant as raw water from the dam would be harmful. responded by stating that currently, the water supply for Mombasa was inadequate but that with the implementation of the proposed project the water problem would be addressed. She informed them that with the completion of the project people would be able to connect water to their homes and nobody will be able to exploit them again.

Q3) Mzee Salim complained that at matopeni the people connected to water but the water only comes once a week yet they continue to receive huge bills. He said that the people attended the meeting because they thought they their water problems would be solved

The consultant informed the people that the water supply was not adequate and this has led to water rationing. She said currently, the water supply for Mombasa was inadequate but that with the implementation of the proposed project the water problem would be addressed. She informed them that with the completion of the project people would be able to connect water to their homes and nobody will be able to exploit them again. She said that due to many connections the water pressure is low and as a result the pipes are not able to deliver water.

Q4) Mr. Hamisi Suleimani requested to know whether water kiosks would still be there.

The KWSCRP representative responded by stating that currently, the water supply for Mombasa was inadequate but that with the implementation of the proposed project the water problem would be addressed. He informed them that with the completion of the project people would be able to connect water to their homes. The KWSCRP representative informed the people that demolition of structures will be after compensation. She said the contractor will start works after the affected persons had been compensated.

Q5) Bwana Mkuu complained that the rainy season was about to start. He requested the ward administrator to inform them what the county government intended to do with the storm water because it is a nuisance.

The ward administrator informed them that he was aware of the problem and in particular at the chief's camp and that he was doing everything possible to alleviate the problem. He said they needed to sit down as the residents and discuss possible solutions to the problems facing the people.

Q6) Dennis Okwara complained that the people at kazandani village had written a proposal for water connection but the owner of the land had barred them from being connected. He requested to know whether the scope of the project could be extended to serve this village. He said the population of the squatters was 300 but had risen to 8000.

The KWSCRP representative responded by informing the people that the scope of the works could not be extended since the project was about the priority lines only. and he was doing everything possible to alleviate the problem. He said they needed to sit down as the residents and discuss possible solutions to the problems facing the people

3) Conclusion

The Consultant thanked everybody and requested them to inform their friends and neighbours about the PAPs census survey exercise.

The ward administrator thanked everyone for attending the meeting and requested that the youth should be given jobs during the project construction phase. He thanked the guests for informing the people about the project in a good and simple way. He requested the people to own the project.

The KWSCRP representative also requested the people to be good ambassadors for the project.

4) Close of Meeting

The meeting ended at 1.30pm with a word of prayer by Ustali Salim Said.

5) Meeting's Attendance List

LIST OF ATTENDANCE

NAME	ORGANIZATION	KITAMBULISHO	SIMU	SIGN
DENNIS KAKUNDE CHIRRO	V/ELDER	16018482	0727454446	
Ricky Onyango	Resident	29403718	0722860632	
John Mrey	Resident	32161902	0711683658	
Juma dosa	Police C	11871585	07222522	
Said Swaleh	P.C	0509021	0722322499	
JOYCE Munbi	[illegible]	53-23449	0723070251	
NAHSHON GAMBO	[illegible]	10305926	0713039415	
Millicent Dzombo	KWSCRP	27609374	073607341	
Margaret Wangari	ZamConsult	11418334	072112235	
Tiberiu Atuti	Zamconsult	29776296	07020283	
Kennedy Mwadime	MOWASSCO	13709408	0722288004	
HAMISI ERRISA	21 wa	26028858	0713060	
ERNEST - MRISA	C.B.O Chairman	12490888	0724466590	
Irene Awour	mKomani	34607596	0714042574	
Aisha Ali	ziwa la ngombe	32840558	0707828860	
Kelvin Kijumba	Resident	28755608	0704433263	
[illegible]				
Timothy Koome	ZamConsult	25276970	0726534616	
Brian Nyaranga	Resident	34643541	0727369770	

11.2.9 Minutes of a Consultation meeting Held at Maweni, Elim Church Hall on 13th March 2018 at 10.00am

1) *Present*

- Mr Dismas Ndirangu – Technical Manager, MOWASCO
- Mr Petro Okodo – Mkomani Ward Administrator
- Mr. Mwero Mkalla - KWSCRP (Coast PMU)
- Margaret Mbugua - Zamconsult Consulting Engineers (Consultant)
- Dr. Joseph Misati - Zamconsult Consulting Engineers (Consultant)
- Mr. Solomon Ondere – Community Policing Chairman
- Mr. Joseph Mumbo – Elder Shauri yako
- Mr. Gabriel Chibwai – Village Elder
- Other leaders and General Public

2) *Minutes*

Introductions

The meeting started at 10.45 am with a word of prayer. The ward administrator welcoming everyone and introduced the guests to the people. He thanked the people for attending the meeting saying there is always something learn. He requested the people present to introduce themselves and invited the guests to address the people.

Presentation on Project by the KWSCRP staff

Mr. Mkalla thanked the people for attending the meeting. He informed the people that the sources of water for Mombasa were limited. He noted the Marere pipeline, Baricho, and Mzima pipeline saying their water supply was inadequate. He said the proposed project was intended to alleviate the water problems in Mombasa. He said that the Mombasa north mainland project was a component of the Mwache dam project and once completed there would be enough water for Mombasa residents. He informed them that the dam would be 87m high,400m wide and 1.5km long He said the existing water supplies are limited and the government in collaboration with the world bank has considered the construction of the said dam and the laying down of pipes that would accommodate the water.

Presentation on Project by the consultant

The Consultant gave a presentation of the proposed project, its scope, and the laws governing the Environmental and Social Process as well as the need to conduct public consultation meetings.

She explained that the project involved replacement of the old pipes and as well as extension of the pipes network by putting up new pipelines. She informed them that the project would be maintained within the road reserve.

The Consultant explained the various impacts associated with the project, throughout the project duration (planning, construction, operation and decommissioning, including possible resettlement of Project Affected Persons (PAPs). The Consultant explained that a Resettlement Action Plan was being carried out in order to identify all the project affected persons (PAPs). Fortunately, the pipelines project intended to stick within the road reserve hence very few people would be identified as PAPs since there was minimal encroachment within the road reserve area. She informed them that the affected would be mapped using GPS with an accurancy of 1metre in UTM coordinate system. She outlined that the cut-off

date for the RAP exercise was 19th of February 2018. As such, any further developments within the project site would not be considered for compensation.

The Consultant also explained that a RAP verification process would be done by KWSCRP before any negotiations/compensation can be done.

Questions, Answers and Feedback

The Consultant then invited the attendees to raise whatever issues they had, in order to have full knowledge on the project.

Q1) Janet inquired to know why they were getting a huge bill yet there was no water.

Q2) Agnes Bile who operates a water kiosk for a women group inquired to know why they only received water for a few days but had to pay huge bills due to the standing charges.

The technical manager – MOWASCO informed the people that the water supply was not adequate and this has led to water rationing. He said that there were too many connections and therefore the water pressure is low and hence the water cannot reach the customers.

Q3) Ephantus Maguma wanted to know whether the project was a completely new project or it was a continuation of the existing projects.

Q4) Tima Rubea encouraged the women to talk in order to get answers since they suffer most due to lack of water. She requested that during construction, work should be given to the youth in the area.

The KWSCRP representative informed them that the old pipes would be replaced since they could not withstand the water pressure once more water was made available. He said that this was a new project to alleviate the water problem in Mombasa. He informed them that already the consultant was using youths in the area to collect data of the affected persons. He informed them that the contractor will also be advised to employ from the communities including women in the project area.

Q5) Ferdinard Wamalwa wanted to know what would happen to the old pipe if this was completely new project. He also inquired of the timeline of the project.

The KWSCRP representative informed them that the pipes that are in good conditions would be incorporated within the project. He informed them that once the RAP report was complete and approved it will be implemented and only then would the contractor starts work. He informed them that Mwache dam construction would start in October 2018. He said the dam construction would take approximately three years.

Q6) Mzee Wafula inquired to know how the water bill would be. He said the people may get excited at the thought of enough water but the price may not be affordable.

The KWSCRP representative informed them that the project was dealing with bulk water supply which once completed would be handed over to MOWASCO for distribution. He said that affordable water tarrifs would be negotiated. He insisted that the project was a national government project and the social responsibility of the government was to provide water

Q7) William Onyango the disabled chairman said as a group they applied for a license to sell water and ever since they were connected they have never received water. He said the meter was removed but they were still being served with water bills. He requested for help to solve the issue once and for all.

Q8) Beatrice said that they were receiving very high-water bill without water and that they were not in a position to pay the bills.

The technical manager – MOWASCO requested Mr. Onyango to visit his office promising that the issue would be resolved. He gave him his phone number so that he could communicate. He advised those receiving bills without any water supply to settle their issues at the office of the commercial officer, MOWASCO. He said they were aware that when the valves are opened some people come and close them denying the people water.

Q9) Alice wanted to know what the problem was since within the same neighbourhood some people receive water while others don't.

Q10) Q10 Mr. Wanderi commented that there was no water yet in the Nyali high end area there was water even to irrigate the lawns.

Q11) Mr. Wanderi also commented that there was no water yet in the Nyali high end area there was water. He said the water chambers were in the area were open.

The technical manager – MOWASCO informed them that some of the residents in Nyali high end area had dug wells for irrigating their lawns. He said they were aware that when the valves are opened some people comes and closes them denying the people water.

Q12) Duncan suggested that since the pipelines were passing along the road the government to put up water kiosks that would be managed by the youth. He also requested that the project should give back to the community as social corporate responsibility by building them a resource center like a hall or a tertiary institution.

The KWSCRP representative reminded them that the government does not do business bu

rather provide services. He informed them that once the project was complete there would be no need for water kiosks as the people will have individual water connections. He said once money was available it will not be diverted to other projects but will be put in the intended project. He insisted the social responsibility of the government was to provide water to the residence of Mombasa.

3) Conclusion

The Consultant thanked everybody and requested them to inform their friends and neighbours about the PAPs census survey exercise.

The KWSCRP representative also thanked the people for attending the meeting. He said it was important to attend meetings so that whatever decision are made you are part and parcel.

4) Vote of Thanks

The ward administrator thanked everyone for attending the meeting. He thanked the guests for informing the people about the project in a good and simple way. He requested the people to own the project. He said that there was a septic tank that had collapsed and lives were lost. He requested the people to report any septic tank or soak pit in their place of residence to allow the county government to carry out inspection.

Mzee Gabriel thanked the visitors for informing and listening to them as they aired their problems. He requested the visitors to visit them more often.

Mr. Jared Ongolo thanked the visitors for the information and requested more meetings to be

organized so that the people can be enlightened.

5) Close of Meeting

The meeting ended at 2.00pm with a word of prayer by Mzee Ali Wafula.

6) *Meeting's Attendance List*

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REPUBLIC OF KENYA
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ATTENDANCE LIST

MEETING: Nyali Elim Church DATE 13/3/2018

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
GABRIEL CHIBWAI	VILLAGE ELDER	0711503313	—	
AGNES MBITHE	Resident MNAZI MOJA	0706346272	—	
Robert Mwakisho	Resident MNAZI MOJA	0723448246	—	
JANE K. SIREDI	MNAZI MOJA	0726603744	—	
PETRO OKODO	MKOMANI WARD ADMIN	0720951412	okodopetro@gmail	
Margaret Irungu	Zam Consult Consulting Engs	0721 122 354	wangariephantus@yahoo.co.uk	
MWERO MKALLA	SDS-COAST KWSCRP (COAST PMU)	0722-390642	mmkalla@kwscrp.org	

(2)

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ATTENDANCE LIST

MEETING: DATE 13.3.18

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
Onyango William	Kisumu ndogo	0725670365	—	
Janet Masiza	Resident Mnazi moja	0705211660	—	
Pauline Rapela	Resident mnazi moja	0723626650	—	
Duncan Ndita	Resident Mnazi moja	0712906448	duncancardozoslim298@gmail.com	
Fred Simiyu	Resident Shauriyako	0727861522	simiyufred618.gmail.com	
Esther Denibekho	Resident Mnazimoja	0724356954	—	
MOSES MULONGO	RESIDENCE Shauriyako	0717986298	mulongomoses@yahoo.com	

(3)

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ATTENDANCE LIST

MEETING: _____ DATE 13/3/2018

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
HESBON A. FESTUS	Shauri Yako	0711-251283	HESBONFESTUS@Yahoo Co	
EWOKA MISOGASHIRAJI	MNAZI MOJA	0715713425	N/A	
DOUGLAS OCHIENG	Mnazi Moja	0714094263	dochieng.do@gmail.com	
Laban Edgar	Mnazi Moja	0717810246	—	
George Wafula	Shauriko	0705750099	—	
EPAPHRAS MASUMBA	LOYAL FRIENDS YOUTH GROUP	0722342821	Papkies26@gmail.com	
BRIAN JONES	LOYAL FRIENDS YOUTH GROUP	0753955729	Brianjones36@gmail.com	

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ATTENDANCE LIST

MEETING: _____ DATE 13·3·18

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
Alex Kigaro	Resident Mnazi moja	0703691851	—	
ALICE WAMBUI	MNazi moja	0721305629	—	
Sidi Munga	Resident Mnazi moja	0727214115	—	
MUSA DNYANGID DKETCH	MNAZI MOJA	0731245 286	—	
Jenifer Wandera	Resident Shauriyako	0729896773	—	
Evaline Adhiambo	Resident Mnazi moja	0703726096	—	
Josphine Adhiambo	Resident Mnazi moja	0716664055	—	

(5)

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ATTENDANCE LIST

MEETING: _____ DATE 13·3·18

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
Caroline Akinyi	Mnazi moja	0795423318	—	
Richard Ondigi	Resident Ngali Hill Acad	0722270882	—	
MOURINE ATIENO	Mnazi moja	0711662558		
FLORENCE MGHOI	mzamazi moja	0713901848	—	
PAUL OPUOR	MNAZI moja	0720679611	—	
EUNICE AKINYI	MNAZI MOJA	0722547	—	
CAROLINE OKATA	MNAZI MOJA	0738376887	—	

(6)

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ATTENDANCE LIST

MEETING: _____ DATE 13·3·18

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
GRACE Vugaza	Resident Mnazimoja	0742688958	—	
Joseph odhiambo	LOYAL FRIENDS YOUTH GROUP	0743112362	—	
Pauline Kema	Mkaazi mnazi moja	0723 611935	—	
Mwanaamisi Juma	Resident Mnazi Moja	0706216742	—	
FREDRICK BWIRE	" " "	0723758421	—	
Pius Madangu	" " "	0727810495	—	
ANGELINE BRUHO	" " "	0708172910	—	

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ATTENDANCE LIST

MEETING: _____ DATE 13.3.18

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
Wilkister Achieng	Resident Mnazi moja	0700487661	—	Achieng
Nasra Thomas	Resident Mnazi moja	0713323498	—	
Roseline Adhiambo	Resident Mnazi moja	0728855647	—	
Sabina Juma	Resident Mnazi moja	0714514433	—	
Beatrice Osiako	Resident Mnazi moja	0717505691	—	Beatrice
BEATRICE TIMBOI	Resident mnazi moja	0713289510	—	
Simon Kioko	PLL Mnazi Mja	0723103151	Skioko2017@gmail.com	

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ATTENDANCE LIST

MEETING: _____ DATE 13.3.18

NAME	TITLE&INSTITUITION	TELEPHONE	EMAIL	SIGNATURE
Mary Atieno Akal	Mnazi moja	0714559138	—	
Amina Mohammed	Resident Mnazi moja		—	
Esther Nabwire	Resident Mnazi moja	—	—	
Philip Ruwa	Mnazi Moja	0725441377	Kellyruwa@gmail.com	
Irine Ainga	Resident Mnazi moja	0710136564	—	
Solomon ONDERE	COMMUNITY P. CHAIRMAN	0707977358	—	
JOSEPH M. MUMBO	ELDER SHAURIYA	0726475977	Josephmumbo55@gmail.com	

11.2.10 Public Consultation Photos

Figure 11-1: Kick Off Meeting at KWSCRP Offices Mombasa

Figure 11-2: Meeting with Ward Administrators

Figure 11-3: Meeting with the Nyali Residents Association

Figure 11-4: Meeting at Ziwa la Ng'ombe

Figure 11-5: Meeting at Kongowea

Figure 11-6: Maweni, Elim Church hall

11.3 CHANCE FIND PROCEDURES

Chance find procedures are an integral part of the project ESMMP and civil works contracts. The following is proposed in this regard:

- If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:
- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Ministry of State for National Heritage and Culture take over;
- Notify the supervisor, Project Environmental Officer and Project Engineer who in turn will notify the responsible local authorities and the Ministry of State for National Heritage and Culture immediately (within 24 hours or less);

Responsible local authorities and the Ministry of State for National Heritage and Culture would then be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the National Museums of Kenya. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, namely the aesthetic, historic, scientific or research, social and economic values.

Decisions on how to handle the find shall be taken by the responsible authorities and the Ministry of State for National Heritage and Culture. This could include changes in the layout (such as when finding irremovable remains of cultural or archeological importance) conservation, preservation, restoration and salvage.

Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities.

Construction work may resume only after permission is given from the responsible local authorities or the Ministry of State for National Heritage and Culture concerning safeguard of the heritage.

11.4 PROPOSED PROJECT PIPELINES UNDER PRIORITY 1D

The Map is attached as a separate document

11.5 PROTOCOL ON HANDLING ASBESTOS

11.5.1 Introduction and Risks posed by Asbestos

Asbestos is a group of six fibrous minerals that occur naturally in metamorphic deposits located around the world. Of the hydrous magnesium silicate variety, the six types include tremolite, actinolite, anthophyllite, chrysotile, amosite and crocidolite.

Asbestos is a hazardous material with extremely fine fibres and can remain suspended in air for hours. If handled without caution, it may cause serious chronic health problems such as asbestosis, lung cancer and mesothelioma. The diseases cause long term serious social, economic and emotional problems. However if left undisturbed asbestos materials do not pose a health risk. It is for this reason that this ESIA report proposed leaving the asbestos pipes undisturbed however in case the asbestos is accidentally encountered this protocol has been provided to handle and dispose the asbestos.

11.5.2 Working around the Asbestos

MOWASCO has already undertaken an inventory of all the asbestos pipelines, which is a major step. During Construction works the Contractor will have an inventory of the asbestos pipelines and their location in order to protect the pipes from disturbance. In addition the Contractor will:

1) Continuously update the inventory of all asbestos the pipelines;
2) Notify NEMA on the asbestos pipelines making use of a form available on their website;
3) Cordon off any workspaces exposed with asbestos;
4) Provide workers working near exposed asbestos with suitable PPE including respirators, overalls, boots, gloves and eye protection;
5) Provide health and safety training for all staff working near the asbestos pipes.
6) Ensure that work is carried out under the supervision of experienced and qualified personnel;
7) If the asbestos is removed an ESIA will be prepared identifying the potential disposal sites and measures undertaken to protect the environment.

11.5.3 Removal of Asbestos

If any AC pipes are encountered and exposed during the works, the Contractor will have to remove and dispose the pipes after preparation of an ESIA report. Removal, handling and storage of the pipes will use the following steps:

1) Wet the asbestos sheets before removal. If asbestos sheets should begin to crack or crumble, immediately wet the cracked or broken areas gently. NB. Breakage releases asbestos fibres.
2) Remove pieces of asbestos sheets by pulling any fasteners (nails, screws, rivets) or cutting fastener heads so as to minimize breakage.
3) Carefully lower removed asbestos pipes to the ground. Do not throw or drop it.
4) Care should be taken not to stand or sit on the asbestos sheets to avoid breakage.
5) The removed bulky asbestos 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.

6) 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. The bags containing the asbestos pieces should be considered full when half full and should be tightly sealed.
7) Care should be taken to ensure that sharp pieces do not puncture the bags/ wrappers.
8) Asbestos can only be stored for a short while before disposal at the project with restricted access and interference to prevent further breakage.

11.5.4 Transportation

The removed AC pipelines will then be transported to the identified disposal site. The identified transporter should be licensed by NEMA to transport waste and should meet the following requirements:

1) The waste transporting vessel must be lined with a 500 gauge double wrapped plastic sheet with every seam sealed with a tape and covered.
2) The transportation vessel should be clearly labeled "DANGER" or "HAZARDOUS MATERIAL"
3) The bags and stacks should be gently loaded into transportation vessel.
4) The AC pipes should be transported to a prepared disposal site that is authorized by NEMA.
5) The vehicle should be thoroughly washed after disposal.

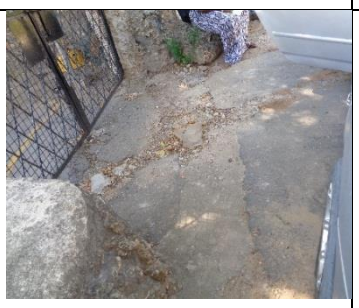
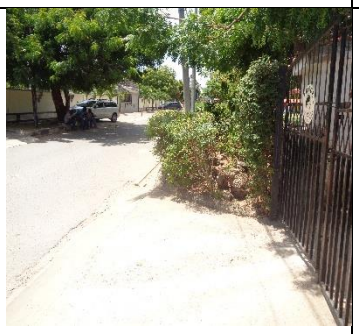
11.5.5 Disposal

The disposal site should be licensed by NEMA either public or privately owned, which is located at least 50m all around from any human settlement, fenced off and not interfere with the water table. The following are the disposal procedures:

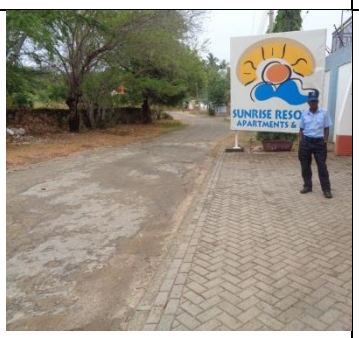
1) The depth of the disposal pit shall be as deep as practically possible to accommodate more asbestos waste but at least one (1) metre above water table.
2) The asbestos should be lowered gently into the disposal site and should not be dropped from any height to avoid breakage.
3) When all available asbestos has been lowered into the pit, cover with polythene paper followed by 6 inch layer of soil. Continue doing this until the pit is full or the waste is finished.
4) The pit shall be considered full when the asbestos waste is one meter below the ground level or the asbestos waste is exhausted.
5) After the pit is full, cover with 500 gauges double wrapped polythene sheet and fill the pit with layer of soil up to the ground level.
6) The disposal site should be completely fenced off with at least chain link and a lockable gate which shall be locked at all times. The fence should be at least one (1) metre from the edge of the pit.
7) Warning notices stating "Asbestos hazard area, keep out" shall be placed at the disposal site. These signs, with lettering of minimum 150mm in height, are to be placed so that they are clearly visible.
8) Following the completion of use of the disposal site, the Contractor will notify NEMA.

11.6 LIST OF SENSITIVE RECEPTORS ALONG THE VARIOUS PIPELINE ROUTES

No.	co-ordinates Northing co-ordinates Eastings	Photos of Affected assets	Road	Name	Approximate Distance From Pipeline
1	9552190.32 576732.39		Nyati road	USAID Afya Pwani	15m
2	9552361.04 576825.64	 1082797	chui road	Nothern Corridor Transit and Transport	12m
3	9552753.52 577477.71		Oleander/ Link road	Oriel limited	15m
4	9551913.73 577207.82		Coral Drive Road	Angels on earth centre for special needs student	15m

No.	co-ordinates Northing co-ordinates Eastings	Photos of Affected assets	Road	Name	Approximate Distance From Pipeline
5	9551409.49 576543.75		Mama Ngina Drive	Masjid Noor mosque	13m
6	9551145.16 576712.49			Nyali Academy	10m
7	9551104.317 577316.66		Bondeni Road	Pandya	20m
8	9551151.1. 576720.1		Seaview road	Mombasa Academy	15m
9	9551299.951 577664.348		Seaview road	Kenya Power Lighting Company	25m

No.	co-ordinates Northing co-ordinates Eastings	Photos of Affected assets	Road	Name	Approximate Distance From Pipeline
10	9552651.04 577241.13		Links road	veterinery clinic	10m
11	9553889.94 578652.27			county government	
12	9553956.59 578693.21		Links road	Roberto's	20m
13	9554681.45 579575.14		Links road	Kigothos hotel and apartments	10m
14	9555010.26 57904.45			Rainbow connection kindergarten	15m

No.	co-ordinates Northing co-ordinates Eastings	Photos of Affected assets	Road	Name	Approximate Distance From Pipeline
15	9555073.34 579909.22		Links road	Bliss resort	8m
16	9554975.04 580020.4		Mwamba Drive	SUNRISE RESORT APARTMENT	8m
17	9554743.42 579855.12		Mt Kenya road	one stop for wide variety	4m
18	9553954.1 579395.4		Mt.Kenya Road	Voyager	30m

No.	**co-ordinates Northing** **co-ordinates Eastings**	**Photos of Affected assets**	**Road**	**Name**	**Approximate Distance From Pipeline**
19	9553635.54 579122.14		Mt.Kenya Road	Garden Groove Limited	15m
20	9553308.79 577777.9		Beach Road	Maville Academy	15m
21	9553175.74 577621.66		Bandari Road	Mt Zion Children Home	15m
22	9553480.2 577860.44		Road to foremost	Foremost Intergrated academy	10m

No.	**co-ordinates Northing** **co-ordinates Eastings**	**Photos of Affected assets**	**Road**	**Name**	**Approximate Distance From Pipeline**
23	9554117.4 578268.08		Nyali palm estate	Derberdgit	15m
24	9554756.5 579551.5		Nyali health care road off links road	Nyali health	10m
25	9553879.14 577392.92			St Patrick Junior Academy	Pipeline touches school structure
26	9553853.29 577385.34			River Of Life Hope Ministry	Pipeline touches structure

No.	co-ordinates Northing co-ordinates Eastings	Photos of Affected assets	Road	Name	Approximate Distance From Pipeline
27	9553853-29 577385.34			Salvation And Resurrection Power Ministries	Pipeline touches structure
28	9553159.58 577167.66		Makongeni road	Miracle Land Ministry Church	Pipeline touches structure
29	9553159.58 577167.66		Makongeni road	ECD and PRY school	Pipeline touches structure
30	9552965.93 577022.74			Twiga Villas	15m

No.	co-ordinates Northing co-ordinates Eastings	Photos of Affected assets	Road	Name	Approximate Distance From Pipeline
31	9552289.44 576461.522			Coast haulias	15m
32	9552749.53 576724.86			Mahanaim Bible college	10m
33	9552835.95 576452.28			Peculiar Juniour Academy	7m
34	9553171.82 575914.67		kilima road	Jambo health clinic	Pipeline touches structure
35	9553507.85 576563.97	1224247		Resurrection power ministry	5m
36	955167.74 575866.45	1234349		Fort View Hotel/apartment	8m

No.	**co-ordinates Northing** **co-ordinates Eastings**	**Photos of Affected assets**	**Road**	**Name**	**Approximate Distance From Pipeline**
37	9551491.64 575977.97		Cement road	English point	20m