

**REPUBLIC OF KENYA**



**MINISTRY OF ENVIRONMENT, WATER &  
NATURAL RESOURCES**

**COAST WATER SERVICES BOARD (CWSB)**



**REVIEW OF ENVIRONMENTAL AND SOCIAL  
IMPACT ASSESSMENT REPORT  
FOR  
MOMBASA WATER SUPPLY, EXPANSION OF  
DISTRIBUTION SYSTEMS, LOT 2**

Report Prepared by:



Zamconsult Consulting Engineers

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## EIA EXECUTIVE SUMMARY

### **Introduction**

Zamconsult Consulting Engineers Ltd (The Consultant) has been commissioned by the Coast Water Services Board (CWSB) to carry out a review of an Environmental and Social Impact Assessment, previously carried out by egis BCEOM/MIBP JV, for the proposed Augmentation of Water Distribution Network within Mombasa Water and Sanitation Company's (MOWASCO) area of jurisdiction in Mombasa.

The previous report has already been issued with a license from the National Environmental Management Authority (NEMA), however before construction is possible, a review of the ESIA report had to be done so as to incorporate updated laws and comments by the World Bank.

CWSB is the agency charged with the responsibility for the effective and efficient provision of water and sanitation services within the Coast Province. The Board undertakes this by contracting the provision of water supply and sanitation services to various Water Service Providers.

The area under MOWASCO's jurisdiction is supplied with water from Mzima, Marere, Baricho and Tiwi Bulk Water Systems.

The Project Region is defined by the area within reach of Mombasa Water Supply coverage and includes:

- Mombasa Island:- covers the Mombasa Island in its entirety
- North Mainland:- covers Nguu Tatu to Nyali Bridge in the South and Mtwapa Bridge in the North;
- West Mainland: - covers supply area downstream of Mazaras Town and S. Mainland up to Chagamwe and Port Reitz Areas.
- South Mainland: - covers Likoni and Mtongwe Areas.

This report is focused on the proposed interventions for the proposed Lot 2 pipelines which fall within MOWASCO's area of supply. The Scope of Works for Lot 2 includes the replacement and Expansion of 85.5km of Trunk Water Distribution Mains on Mombasa Island, Mombasa North Mainland, West Mainland and South Mainland.

The infrastructure to be supplied and installed is described in detail in Chapter 4 of this Report. The various sites within the Project Area are accessible through:

### **Mombasa Island**

- i) Makupa Causeway-(from west mainland)
- ii) Nyali Bridge-(from north mainland)
- iii) Likoni Ferry-(from south mainland)

### **North Mainland**

- i) Nyali Bridge-( from island)
- ii) Mtwapa Bridge on Mombasa-Malindi Road-(from Malindi)
- iii) Sabaki Pipeline Road-(from south mainland)

### **West Mainland**

- i) Nairobi-Mombasa Road-(from Nairobi)
- ii) Makupa Causeway-(from island)

### **South Mainland**

- i) Likoni Ferry
- ii) Lunga Lunga – Mombasa Road

The project is estimated to cost Ksh. 1.4x10<sup>6</sup> with a construction duration of 24 months.

The initial visits to the site to conduct the Environmental Impact Assessment including Public

Consultations were carried in the period August – November 2011 by egis BCEOM/MIBP JV. The Consultant however carried out a confirmatory site visit for purposes of the review for the period dating January 8<sup>th</sup> – January 20<sup>th</sup> 2015. The Consultant carried out a scoping exercise of the area to see if any changes had occurred.

### ***Legislative Framework for this Study***

The principal National legislation governing issues of environmental concern in Kenya is the Environmental Management & Coordination Act of 1999 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 1999 namely the Environmental Impact Assessment and Audit Regulations 2003; The Environmental Management Act, Coordination (Waste Management) Regulations 2006; the Environmental Management Coordination (Water Quality) Regulations 2006; and the Environmental Management and Coordination (Noise and Excessive vibration pollution Control) Regulations 2009 (Legal Notice 61), Air quality Regulations 2009 among others.

Sectorial legislation applicable to this Project include The Lands Act (2012), the National Land Commission (2012), the Wildlife Act Cap 376, The Public Health Act (CAP. 242), the forest act (2005) and the Physical Planning Act (Cap 286) among others.

### ***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 socioeconomic benefits to the people and will contribute to their health and well-being. Overall, negative expected impacts are related to pipeline and associated infrastructure rehabilitation such as valve chambers, washouts and water storage tanks and replacement and expansion construction works and operations. 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.

A significant Planning Phase impact is the land-take for construction. This is adverse, long-term and irreversible. The pipeline will be confined to a 9m reserve. Existing road reserves will be utilised as much as possible. A detailed Resettlement Action Plan has been prepared and approved for implementation by the client.

Significant Construction Phase impacts are generally significant in magnitude and socially and environmentally adverse but are also reversible, short-term and largely manageable. Construction camp impacts include generation and inappropriate disposal of solid and liquid wastes, haphazard exploitation of natural resources in the surrounding areas e.g. trees for firewood, increased spread of Sexually Transmitted Diseases (STD) and HIV/AIDs and change of cultural norms from migrant workers. Construction work impacts include noise, dust, disruption of services like water supply, electricity supply and disruption of storm water facilities, loss of flora and fauna. Other detrimental construction phase impacts derive from extraction of materials in borrow and quarry sites and their subsequent haulage and stockpiling. Positive construction phase impacts include economic boost from injected construction money which is spent in the local environment for purchasing food and other supplies, rental accommodation and local travel. Also, there will be opportunity for skills transfer and skills acquisition.

Operation phase impacts will largely be positive benefits accruing from operation of improved water supply and sanitation. These include less water-borne disease, reduced water costs and therefore reduced cost of living, improved access to water, improved comfort and regional prosperity. There will be overall improved quality of life due to multiplier benefits of improved service delivery. However, significant adverse impacts from operations include solid waste disposal from the facilities, increased risk of HIV/AIDS and STD infections since a development of an area inevitably comes with vices from migrant community.

De-commissioning of the Project is not envisaged. Project components however will be rehabilitated over time having served their useful life.

***Environmental & Social Mitigation and management Plan (ESMMP)***

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

<b>Environmental / Social Impact</b>	<b>Mitigation Action Plan</b>	<b>Responsibility</b>
Land acquisition for laying of pipeline	The pipelines will be laid within the existing road reserves as much as possible. In case there is need for private land acquisition then compensation to be done according to the prevailing market rates in the area.	MOWASCO
Loss of structures	As a first step, the owners, type of structures and businesses are identified. The compensation will be done at replacement cost.	MOWASCO
Loss of livelihoods	Loss of livelihoods to be valued and compensated to ensure that project affected persons (PAPs) continue with their normal lives(or better) as before the project	MOWASCO

Environmental / Social Impact	Mitigation Action Plan	Responsibility
Loss of flora and fauna	<p>Site clearance should be limited to the minimum area required for the execution of the works.</p> <p>The records of the number and tree species cut to be kept.</p> <p>Replanting of indigenous trees after the project is completed.</p> <p>Top soil should be stockpiled separately from the subsoil. After completion of works, the subsoil should be backfilled first then top soil should be restored on top to facilitate natural regeneration of those areas.</p>	<p>Contractor</p> <p>Supervisor – project Engineer to consult KFS on appropriate replanting seedlings</p> <p>Sub-County Environmental officer</p>
Air pollution	<p>Vehicles and other equipment emissions would be kept to a minimum by servicing and maintaining the equipment to manufacturer’s specification. In, addition the contractor to be encouraged to use unleaded and low sulphur content petrol and diesel respectively for all equipment and vehicles</p> <p>The Contractor should also make use of the readily available labour for carrying out construction activities.</p>	<p>Contractor</p> <p>Supervising Engineer</p>
Noise and Dust	<p>Use protective clothing like helmets and dust masks on construction crew.</p> <p>Avoid night time construction when noise is loudest. Avoid night-time construction using heavy machinery, from 22:00 to 6:00 near residential areas;</p> <p>No discretionary use of noisy machinery within 50m of residential areas;</p> <p>Good maintenance and proper operation of construction machinery to minimise noise generation;</p> <p>Installation of temporary sound barriers if necessary; and</p> <p>Construction sites and transportation routes will be water-sprayed on dry and windy days up to three times a day, especially if these sites are near sensitive receptors, such as residential areas or institutions.</p>	<p>Contractor</p> <p>Supervising Engineer</p>

Environmental / Social Impact	Mitigation Action Plan	Responsibility
Generation of solid and liquid waste	<p>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.</p> <p>Put in place adequate and efficient sanitary facilities for handling liquid waste especially waste water to protect the river from pollution.</p> <p>Wastewater from residential quarters and offices to be directed to constructed septic tanks for safe handling.</p> <p>Pit latrines can be used in areas where the other services are not available or feasible</p>	Contractor Supervising Engineer MOWASCO
Pollution of water resources	<p>Ensure proper solid and liquid wastes disposal mainly from the construction camps and offices.</p> <p>Ensure proper measures are in place for collection and disposal of spilled oils and lubricants.</p>	Contractor, Supervising Engineer District Water Officer
Health and safety	<p>Provision of Personal Protective Equipment (ear muffs, gloves, dust masks and helmets) for the construction crew</p> <p>Employ a safety and health officer on site.</p> <p>Provide First aid kit and appropriate procedures and safety measures</p> <p>Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards.</p> <p>Provide workers training on safety procedures and emergency response such as fire, oil and chemical spills, pipe bursts and other serious water loss risks.</p> <p>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.</p> <p>Provide information, education and communication about safe uses of drinking water.</p>	Contractor Supervising Engineer MOWASCO

Environmental / Social Impact	Mitigation Action Plan	Responsibility
	<p>Provide condom dispensers at appropriate locations coupled with awareness campaigns to workers and surrounding communities on HIV/AIDS throughout the construction period</p> <p>Provide enough toilets within the camp</p> <p>Work to minimize or altogether eliminate mosquito breeding sites.</p> <p>Provide appropriate human and solid waste disposal facilities</p> <p>In general comply with operating occupational health and safety law requirements</p>	
Unaccounted Water (UFW) For	<p>Ensure proper and accurate records on production and consumption are kept through metering to detect any UFW in the system. Have a leak detection program to identify aging pipes for replacement to control UFW. Any leakages and bursts to be repaired promptly. If these standards are met the tariffs are likely to be within affordable range.</p>	MOWASCO beneficiaries
Traffic Congestion	<p>Provide temporary road signs or notices to indicate ongoing works</p> <p>Plan itineraries for site traffic on a daily basis and avoid peak traffic periods;</p> <p>Effect traffic controls and cleanliness to avoid congestion and truck accidents on roads to ensure that transportation vehicles are operated during night-time and off-peak hours to avoid peak traffic. With proper vehicle operation control, adverse impacts on the environment and traffic by the transportation will be minimal;</p> <p>Choose traffic routes to reduce the impact in the neighbourhood avoiding, as far as practical any sensitive areas;</p>	The Contractor Supervising Engineer
Gender balance	<p>Ensure equitable distribution of employment opportunities between men and women</p> <p>Provide toilets and bathrooms for both male and female workers on site</p>	The contractor The Supervising Engineer

Environmental / Social Impact	Mitigation Action Plan	Responsibility
Service Delivery	<p>Provide appropriate signage to warn motorists and other road users of the construction activities, diversion routes to ward off traffic accidents.</p> <p>Communicate any intended disruption of the services to enable the people to prepare e.g. by having emergency water storage and provision facilities.</p> <p>Areas being trenched to be temporarily cordoned off to avoid people and animals accidentally falling into open trenches.</p> <p>In the event that delivery trucks damage parts of the road, repair the spots in consultation with the local authorities.</p> <p>Provide adequate water storage facilities to ensure adequate supplies to meet the new demand.</p> <p>Ensure proper maintenance of the water works</p> <p>Use pipes of good quality materials</p>	The Contractor

### **Conclusion**

The ESIA concludes that the project has a potential to improve both the social and economic aspects of the areas being affected. It will primarily bring about better distribution of water within the areas being served. It will also bring about employment during project implementation and supply sufficient potable water to meet projected future demands of domestic and other uses in the project area. In summary although the adverse impacts are present, the positive aspects outweighs them.

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 direct land take, demolition of structures and livelihood will be done through a detailed Resettlement Action Plan.



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## **ACRONYMS AND ABBREVIATIONS**

AIDS	Acquired Immunodeficiency Syndrome
CBD	Central Business District
CBO	Community Based Organization
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
G.O.K	Government of Kenya
HIV	Human Immunodeficiency Virus
ID No.	Identity Card Number
Ksh.	Kenya Shillings
KFS	Kenya Forestry Service
KWS	Kenya Wildlife Service
CWSB	Coast Water Services Board
MOWASCO	Mombasa Water and Sewerage Company
MAWASCO	Malindi Water and Sanitation Company
KIMAWASCO	Kilifi Water and Sanitation Company
KWAWASCO	Kwale Water and Sanitation Company
TAVEVO	Taita and Taveta Water and Sanitation Company
LAWASCO	Lamu Water and Sanitation Company
NALEP	National Agriculture and Livestock Extension Programme
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NMK	National Museums of Kenya
O&M	Operation and Maintenance
PAP	Project Affected Person
PPE	Personal Protective Equipment
STD	Sexually Transmitted Diseases
UFW	Unaccounted for Water
WRMA	Water Resources Management Authority

WSB	Water Services Board
WSP	Water Services Provider
WSS	Water Supply and Sanitation Services
m <sup>3</sup>	cubic metres

## **1 INTRODUCTION**

The Coast Water Services Board (CWSB) is a Parastatal (Government Owned and Autonomous) created under Water Act, 2002 and established through a Gazette Notice No. 1328 of 27 February 2004.

CWSB (or the Board) is the agency charged with the responsibility for the effective and efficient provision of water and sanitation services within the Coast Province. The Board undertakes this by contracting Water Service Providers.

Seven Water Services Providers (WSPs) whose areas of jurisdiction correspond with the seven initial districts of Coast Province, namely, Mombasa, Malindi, Kilifi, Kwale, Taita and Taveta, Lamu and Tana River have been appointed by the Board to provide water and sanitation services in their respective jurisdictions. The WSPs are Mombasa Water and Sanitation Company (MOWASCO), Malindi Water and Sanitation Company (MAWASCO), Kilifi Water and Sanitation Company (KIMAWASCO), Kwale Water and Sanitation Company (KAWASCO), Taita and Taveta Water and Sanitation Company (TAVEVO), Lamu Water and Sanitation Company (LAWASCO) and Tana River respectively.

Unlike in other parts of the country, CWSB is also the water undertaker for the Coastal Bulk Water Supply System. Additionally, the Board is the asset holder of all public water and sanitation facilities within its area of jurisdiction.

As a step towards addressing the above challenges, CWSB engaged egis BCEOM/ Mangat, I.B. Patel & Partners (Joint Venture) as Consultants to undertake Final Design for the Rehabilitation and Expansion of Water Supply in the City of Mombasa. This included undertaking of Environmental and Impact Assessment Study Report. Pending comments from the World Bank, the CWSB engaged the services of Zamconsult Consulting Engineers to carry out a review of the Environmental and Social Impact Assessment Previously carried out, so as to make it up to date as the project is very close to implementation.

Zamconsult consulting engineers was to carry out a review of the pre-existing environmental and social impact assessment report carried out in February 2012 so as to capture any views from the community which might have changed over the period or had been left out by the earlier report. The review was to also capture the guidelines that had been provided by World Bank on the initially submitted report.

During the study on the required investment in urban water supply and sanitation infrastructure within Mombasa City (Task 1), it was noted that it would require close to Euros 23,000,000 to rehabilitate and expand the urban water supply infrastructure that can satisfy the 2030 water demand.

As part of the Assignment and in compliance with the Environmental Management and Co-ordination Act, the Consultant carried out an Environmental Impact Assessment (EIA) Study Report of the Proposed Project Works so as to develop an EIA Project Report for submission to NEMA. The report was submitted to NEMA and a license issued. The license has not expired and as such the Consultant observes that there is no need to re-apply to NEMA as the license has not yet expired.

### **1.1 Objectives of the Assignment**

The Objectives of the Environmental Impact Assessment carried out by egis BCEOM/MIBP were:

- To fulfil the legal requirements as outlined in Section 58 to 69 of the Act and Regulation 7 of the EIA Regulations;



- To obtain background biophysical information of the site, legal and regulatory issues associated with the project;
- To assess and predict the potential Impacts during site preparation, construction and operational phases of the project;
- To make suggestions of possible alterations to the proposed design, based on the assessment findings
- To propose mitigation measures for the potential significant adverse environmental impacts and safety risks;
- To allow for public participation;
- To lower project cost in the long term;
- To prepare an Environmental Management and Mitigation Plan; and
- To compile an EIA Project Report for submission to NEMA.

As part of the review, the Consultant's objectives include:

- To fulfil the legal requirements as outlined in Section 58 to 69 of the Act and Regulation 7 of the EIA Regulations;
- To review the initially obtained background biophysical information of the site, legal and regulatory issues associated with the project and obtain any new information on the same;
- A review of the legal and regulatory framework governing the project.
- To review the assessed and predicted potential Impacts during site preparation, construction and operational phases of the project;
- To review the suggestions of possible alterations to the proposed design, based on the assessment findings
- To review the proposed mitigation n measures for the potential significant adverse environmental impacts and safety risks;
- To lower project cost in the long term;
- To establish the Cost of Environmental Mitigation
- To prepare an Environmental Management and Mitigation Plan;
- To prepare an Environmental and Social Monitoring Plan
- To Identify whether the report initials submitted covered lot 2 only or both lot1 and lot 2
- To ascertain if the report had been reviewed and any visits carried out since submission in 2012.
- To carry out public consultation so as to inform the project affected people about the project scope, exact location and schedule of activities ahead of the works.

## **1.2 Methodology of Work**

The ESIA was undertaken at a level that was considered to be commensurate with the scale, complexity and sensitivity of the project. The key stages in the process included proposal definition, screening, scoping, key informant & household consultations, impact assessment, mitigation, review, decision-making and monitoring. For this ESIA to be good, recommendations have been integrated into the project development process and relevant adjustments made as stipulated by the comments and incorporated into the reviewed report. This should not be seen as a barrier to development or as an unnecessary cost. As well as being a stepping-stone to consent from environmental regulators and financial backers, it is a management tool for use during project planning and execution and will help avoid unnecessary impacts, delays and unexpected costs.

The consultant used a holistic approach to obtain the necessary baseline data and information on the below-listed aspects of the ESIA study. The ESIA was carried out through the following two major data collection and analysis processes:

### **1.2.1 Desktop Studies**

The desktop study mainly involved:

- Checklist that consists of a simple catalogue of environmental factors, which are compared with the activities to be developed;
- Initial meetings with the Client to discuss the proposed Project, including various sites and activity options under consideration;
- Collection 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;
- Review of existing Legislation, Regulation and Policies relevant to the proposed Project;
- Review of proposed Project Engineering Designs, previously carried out ESIA reports and Construction Inputs, including anticipated technical processes if any.

### **1.2.2 Field Investigations**

The activities carried out under the field Investigations involved:

- Site visits to the Project Area and the neighbouring areas that are within the zone influenced by the Project;
- Taking photographs of significant aspects to assist in describing the baseline environmental and social conditions of the Project Area and its influence zone.
- Interviews with representatives of relevant key regulatory authorities within the project area and interested and affected parties mainly within the Project influence zone.
- Obtaining relevant documents from the authority such as Local government, licensing board which is within the Project influence zone.

The aim of the field investigations was to verify information and data collected during the desktop study and earlier field investigation and collection of any new information that may be important in the assessment of impacts and design of mitigation measures.

## 2 PROPOSED PROJECT DESCRIPTION JUSTIFICATION AND ALTERNATIVES

### 2.1 Location

The Project is located in Mombasa County and its coverage area includes:

- i) Mombasa Island.
- ii) North Mainland which covers Kisauni area up to Mtwapa creek and the Malindi road strip from Nyali to Shanzu
- iii) West Mainland which covers Mazeras up to Changamwe and Port Reitz
- iv) South Mainland which also covers likoni and Mtongwe Areas.

### 2.2 The Background of Proposed Project

Coast Water Service Board (CWSB) is a water supply company in charge of maintenance and billing of all water and sewerage services within Mombasa County.

The project involves replacing and augmenting the pre-existing distribution lines within the prestated areas in Mombasa County.

Mombasa Island is mainly supplied by Mzima System, Marere System (Changamwe Reservoir-West Mainland) and Sabaki Pipeline (Nguu Tatu Reservoir-North Mainland). The Trunk Mains consist of steel pipes of diameters between 600mm to 900mm. The Distribution Network is more than 50 years old and has a total length of 73 km with pipes ranging between 75mm to 900mm in diameter. The field assessment of the Mombasa Island revealed that:

- There is insufficient bulk water supply and uneven distribution of the water;
- There are unsupplied areas in the south-east of the Island;
- Poor informal settlements are not supplied.

Mombasa North Mainland which covers Kisauni area up to Mtwapa creek and the Malindi road strip from Nyali to Shanzu is supplied by the Baricho Wells (Sabaki River) through Nguu Tatu reservoir. (Storage capacity 27,100m<sup>3</sup> at 65 masl). The Trunk Mains consist of steel pipes of diameters between 500mm to 800mm. The Distribution Network has a total length of 200 km with pipes ranging between 75mm to 800mm in diameter. The field assessment of the Mombasa North Mainland revealed that:

- The pipes are generally in good condition, except in the Nyali area;
- There are frequent leaks on large diameter mains. There is need for rehabilitation significant number of appurtenances and structures;
- There are some areas which are not supplied (high areas, network extremity, undersized secondary and tertiary network, neem tree roots blockages);
- A Lot of tertiary pipes are located within private properties (Nyali and Shanzu areas);
- Poor areas are not supplied.

Mombasa South Mainland which covers the whole Likoni Division is mainly supplied by Tiwi Boreholes A, C, 4, 7, 8 and 9 by direct pumping and Marere Springs through Kayabombo Reservoir. (Storage capacity 1,140m<sup>3</sup> at 72 masl). The trunk mains consist of steel pipes of diameters between 200mm to 300mm. The distribution network is about 90 km long and consists mainly of

AC pipes (including Ukunda and Diani area). The Field Assessment of the Mombasa South Mainland revealed that:

- The AC and PVC-U lines are made of poor class pipes;
- There are possible water hammers due to direct pumping from Tiwi boreholes (bursts and leaks on the pipes);
- Northern part of Likoni and Mtongwe town are not supplied (network extremity, undersized network and blockages due to neem tree roots);
- ON 200 AC line (from Kayabombo to Diani to Mombasa road along Matuga road) is subject to vandalism (some sections are not buried);
- Poor areas are not supplied.
- Marere Pipeline has been exposed at numerous locations and prone to frequent damages and vandalism.

Mombasa West Mainland which covers the whole Changamwe region is mainly supplied by Mzima springs (Mazeras Reservoir-West Mainland which has a storage capacity 81,000m<sup>3</sup> at 160 masl) and Marere springs directly from Marere pipeline. The lowest part of West Mainland is supplied by Changamwe reservoir (Kipevu area). The trunk mains consist of steel pipes of diameters between 300mm to 525mm. The distribution network is about 104 km long and consists mainly of PVC-U and steel pipes. The field assessment of the Mombasa West Mainland revealed that:

- There are very high static pressures in the network;
- There are frequent bursts and leaks (AC and poor class PVC-U). There is therefore need for rehabilitation of a significant number of appurtenances and structures;
- Areas along Airport and Port Reitz road and Mikindani high area are not well supplied
- (primary network undersized, difficulty of releasing the air from the pipes);
- Some pipes have been subject to landslides along Mombasa road;
- Poor areas are not supplied.

## **2.3 Water Supply**

The Proposed Projects for Mombasa City include the following:

- Rehabilitation and renewal of pipes and structures;
- Reinforcement and extension of pipes;
- Individual metering;
- Extension of pipeline to informal settlement.

The works required for each of the water supply regions are described hereunder.

### **2.3.1 Scope of Works**

#### **i) Lot 2**

- Laying of Pipelines – approximately 85km of pipelines, size ranging from 100mm dia. to 1200mm dia. comprising of the following:
  - 0.9km of 100mm dia. Ferrous pipes

- 18.7km of 150mm dia. Ferrous pipes
- 7.4km of 200mm dia. Ferrous pipes
- 6.3km of 250mm dia. Ferrous pipes
- 8.1km of 300mm dia. Ferrous pipes
- 5.4km of 350mm dia. Ferrous pipes
- 5.4km of 400mm dia. Ferrous pipes
- 2.0km of 500mm dia. Ferrous pipes
- 1.6km of 1000mm dia. Ferrous pipes
- 1.6km of 1200mm dia. Ferrous pipes
- 9.0km of 110mm dia. uPVC pipes
- 9.4km of 160mm dia. uPVC pipes
- 9.7km of 200mm dia. uPVC pipes
- Supply and installation of 19Nr. Bulk Water Meters, diameter ranging from 900mm to 100mm.
- Construction of 60Nr. Water Kiosks and connection to Water Mains.

The Layout Plans for the Existing and Proposed Water Mains are shown in Tables 2-1, 2-2, 2-3 and 2-4 for Mombasa Island, North Mainland, south Mainland and West Mainland.

### 2.3.2 Proposed Water Mains – Mombasa Island

Table 2-1: The Proposed Work for Mombasa Island for Lot 2

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
ISW-02	Reinforcement of distribution networks along Tom Mboya Avenue	400	Ferrous	1130
ISW-03	Reinforcement of distribution network along Kisauni Road and biashara street	200	Ferrous	1430
ISW-04	Reinforcement of the supply of Tudor Area Network along Tom Mboya Road	200	Ferrous	250
ISW-05	Along Tom Mboya Avenue connecting to ISW 04 (Augmentation)	150	Ferrous	2400
ISW-06	CONNECTING ISW 08 to ISW 05 (Tudor Area) (Augmentation)	300	Ferrous	600
ISW-08	Along Haile Selassie Road (Augmentation)	200	Ferrous	1100
ISW-09	Along Mnazi Mmoja Road to Moi Avenue connecting with ISW01	300	Ferrous	500

### 2.3.3 Proposed Water Mains – Mombasa North Mainland

Table 2-2: The proposed Works for Mombasa North Mainland for Lot 2

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
NMW-04	Renewal of Asbestos Cement main from Kiembeni Junction to Bamburi Junction	300	Ferrous	2940
NMW-05	Replacement & Rerouting of Asbestos Cement main pipe between Sheick Sayed Children Welfare Centre & Kidogobasi Estate	400	Ferrous	2000
NMW-06	Replacement of Asbestos Cement pipe from Kidogobasi Estate to Nyalı Road	500	Ferrous	1960
NMW-07	Renewal of Asbestos Cement main along old Malindi road from Kiembeni Junction to Kongowea Area	400	Ferrous	4485
		200	Ferrous	55
NMW-10	Replacement of Asbestos Cement along Links road	160	uPVC	2750
NMW-11	Replacement of Asbestos Cement along Mt.Kenya road.	110	uPVC	1650
NMW-16	Secondary Network Reinforcement of new 150mm dia. uPVC pipe from new Malindi road to Navy radar station	160	uPVC	750
		110	uPVC	1950
NMW-17	Secondary Network Reinforcement of new 100mm dia. uPVC pipe from new Malindi road to Navy radar station	110	uPVC	1500
NMW-20	Network Extension of 150mm dia. uPVC pipe in Nyalı Estate from new Malindi road	110	uPVC	2300
NMW-24	Line along Baobab Holiday Resort (Augmentation)	160	uPVC	1200
NMW-25	Line Connecting NMW08 to NMW17 (Augmentation)	160	uPVC	2000
NMW-27	(1200/ 1000 dia. augmentation) Nguu Tatu connecting to Junda line	1200	Ferrous	700
		1000	Ferrous	2600

### 2.3.4 Proposed Water Mains – Mombasa South Mainland

Table 2-3: The Proposed Works for Mombasa South Mainland for Lot 2

Line ref	Description	Based on 2030 water network analysis
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		Dia.	Type	Length (m)
SMW-01	Renewal of Asbestos cement line from Diani to Mombasa Road to Mtongwe Town	200	Ferrous	3400
SMW-03	Renewal of 200mm dia. uPVC pipe along Diani to Mombasa Road	200	Steel	3550
SMW-04	Renewal of 200mm dia. uPVC section along Diani to Mombasa road between the two asbestos cement mains from Kayabombo Reservoir	200	Ferrous	3000
SMW-05	New 200mm dia. uPVC distribution line along main street tapped down to Starehe Boys 'camp	200	Ferrous	650
SMW	New 1000mm dia. uPVC distribution line along main street tapped down to Starehe Boys' camp	100	Ferrous	600
SMW	New 100mm dia. uPVC distribution line along main street tapped down to Starehe Boys' camp	100	Ferrous	700
SMW-06	New 200mm dia. uPVC pipe connected to Asbestos cement east of Maweni Estate	200	Ferrous	810
SMW	New 150mm dia. uPVC pipe connected to Asbestos cement east of Maweni Estate	150	Ferrous	400
SMW-07	New 150mm dia. uPVC distribution line along Ferry road & Shelly Beach Road along the main street before Wema Cent	150	Ferrous	1810
SMW-08	New Distribution Line 200mm dia. uPVC pipe supplying Maweni Estate to and along coast road	200	Ferrous	4080
SMW-09	New 200mm dia. Distribution Line on Diani to Mombasa road	200	Ferrous	1590

### 2.3.5 Proposed Water Mains – Mombasa West Mainland

Table 2-4: the Proposed Works for Mombasa West Mainland for Lot 2

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
WMW-02	Reinforcement of 150mm dia. uPVC pipe between existing 150mmdia. UPVC pipe on refinery road & 250mm dia. uPVC on Mombasa road	150	Ferrous	1050

WMW-03	Reinforcement of 150mm dia. uPVC pipe between existing 150mmdia. uPVC pipe on refinery road & 250mm dia. uPVC on Mombasa road	150	Ferrous	900
WMW-04	Reinforcement 250 mm dia. pipe connection between Changamwe Road and Port Reitz Road that passes through Soweto Estate	350	Ferrous	850
	Reinforcement 300mm steel pipe connection between Changamwe Road and Port Reitz Road that passes through Soweto Estate	300	Ferrous	200
WMW-05	Reinforcement 200 mm dia. pipe connecting the DN 150 Asbestos Cement Main to Port Reitz Road and the existing DN 150 Asbestos Cement near Health Centre	250	Ferrous	200
WMW-06	Reinforcement of 250mm dia. pipe connecting between the existing DN 525 PRC on Mombasa Road and the existing DN 100 Asbestos Cement near Bomu Estate	350	Ferrous	300
	Reinforcement of 250mm dia. Pipe connecting between the existing DN 525 PRC on Mombasa Road and the existing DN100 Asbestos Cement near Bomu Estate	200	Ferrous	1240
WMW-07	Reinforcement of the supply of Wayani and Bukole Estates: New DN 200 PVC-U loop connection between the new DN 250 PVC-U at Wayani Estate and the existing DN 250 PVC-U on Port Reitz Road (Airport Road) and new DN 100 PVC-U between the new PVC-U near Car Park and the existing DN 75 Galvanised Iron (Bukole Estate)	350	Ferrous	2540
		200	Ferrous	350
WMW-08	Reinforcement of 150mm dia. uPVC pipe between asbestos cement on refinery road & pressed reinforced concrete to Changamwe Reservoir	150	Ferrous	250
WMW-09	Reinforcement of 150mm dia. uPVC pipe on Miritini Estate	350	Ferrous	1300
		250	Ferrous	450
WMW-10	150mm dia. uPVC pipe extension towards Bangladesh poor areas	200	Ferrous	600
WMW-11	150mm dia. extension towards Jomvu Miritini poor areas	150	Ferrous	1150



WMW-12	300mm dia. steel pipe extension towards Mpirani Village	300	Ferrous	200
	200mm dia. uPVC pipe extension towards Mpirani Village	200	Ferrous	870
WMW-13	Renewal of 250mm dia. pipe along Mombasa Road	250	Ferrous	4300
WMW-14	Replacement of 250mm dia. pipe at Port Reitz Road & Air Port Junction	250	Ferrous	50
WMW-15	Renewal of 150mm dia. asbestos cement pipe along Air Port & Port Reitz road	150	Ferrous	3400
WMW-16	Renewal of 250mm dia. asbestos cement pipe along Changamwe Road	250	Ferrous	1020
WMW-17	Renewal of 150 asbestos cement pipe along Changamwe Road	150	Ferrous	6320
WMW-18	Renewal of Existing 250mm dia. Asbestos Cement pipe along Refinery road	250	Ferrous	810
	Renewal of Existing 150mm dia. A.C pipe along Refinery road	150	Ferrous	1100
WMW-19	Renewal of Existing 150mm dia. uPVC pipe on Mombasa Road to Jomvu Kuu Village	250	Ferrous	1100
		150	Ferrous	1100
		100	Ferrous	1100
WMW-20	DN 200 mm Connection between Mzima DN 525 Prestressed Reinforced Concrete and Marere DN 400 Steel Trunk Mains at the junction near Zakhem Construction Company warehouse			

## 2.4 Estimated Project Costs

Table 2-5: Estimated Project Cost for Lot 2

Nr	Location	Estimated Cost (ksh)
1.	Mombasa Island	95,000,000
2.	Mombasa North Mainland	42,000,000
3.	South Mainland	112,000,000
4.	West Mainland	773,000,000
		1,400,000,000

## **2.5 Alternatives to the Project**

At present there are No Alternatives to the Project.

### **2.5.1 No Action Alternative**

The No Action Alternative is the future without the planned rehabilitation Project. This alternative includes all planned or reasonably foreseeable state, local authority, and local water supply projects that could be constructed in the service area in the near future.

### **3 POLICY LEGAL AND REGULATORY FRAMEWORK**

#### **3.1 Policy Framework**

The Kenya Government's Environmental Policy aims at integrating Environmental Aspects into National Development Plans. The broad Objectives of the National Environmental Policy include:

Optimal use of natural land and water resources in improving the quality of Human Environment;

Sustainable use of natural resources to meet the needs of the present generations while preserving their ability to meet the needs of future generations;

Integration of Environmental Conservation and Economic Activities into the process of sustainable development;

Meeting national goals and international obligations by conserving bio-diversity, arresting desertification, mitigating effects of disasters, protecting the ozone layer and maintaining an ecological balance on earth.

Kenya has approximately 77 statutes which relate to Environmental concerns. Most of these statutes are sector specific, covering issues such as public health, soil erosion, protected areas, endangered species, water rights and water quality, air quality, noise and vibration, cultural, historical, scientific and archaeological site, land use, resettlement, etc. Previously, Environmental Management Activities were implemented through a variety of instruments such as policy statements and sectorial laws and also through permits and licenses. For example, the Physical Planning Act of 1996 empowers local authorities to request existing facilities to conduct environmental assessments, while under the Local Government Act of 1998, it is an offence to emit smoke, fumes or dust which may be a source of danger, discomfort or annoyance. With the enactment of the Environmental Management and Co-ordination Bill in December 1999, the institutional framework for environmental management was strengthened. The Environmental Management and Co-ordination Act (EMCA) of 1999 provided for the establishment of a National Environment Management Authority (NEMA), which became operational in July 2002, with the statutory mandate to co-ordinate all environmental activities.

#### **3.2 Legal Framework**

##### **3.2.1 *The Environmental Management and Co-Ordination Act***

The Environmental Management and Co-ordination Act (EMCA) received Presidential assent on 6 January 2000 and was gazetted on 14 January 2000.

The Main Objective of the Act is to:

- Provide guidelines for the establishment of an appropriate legal and institutional framework for the management of the Environment in Kenya;
- Provide a framework legislation for over 77 statutes in Kenya that contain environmental provisions;
- Provide guidelines for Environmental Impact Assessment, Environmental Audit and Monitoring, Environmental Quality Standards and Environmental Protection Orders.

The Second Schedule to the Act specifies the projects for which an EIA or environmental audit must be carried out. According to EMCA, Section 58, all Projects listed in the Second Schedule of EMCA

must submit a Project Report to NEMA. Flood control schemes are listed in No. 4 Dams, rivers and water resources.

The Environmental (Impact Assessment and Audit) Regulations, 2003, provide the basis for procedures for carrying out Environmental Impact Assessments (EIAs) and Environmental Audits (EAs).

In 2001, the Government established the administrative structures to Implement EMCA. The main administrative structures are described in Section 4.3.

### **3.2.2 The Environment Management and Coordination Act (EMCA) 1999 and Its Tools**

The most pertinent and overriding statute that will be evoked is the Environmental Management and Coordination Act (EMCA 1999) was enacted in 2000 to harmonize environmental legislation previously scattered among 77 national laws. As the principal environmental legislation in Kenya, EMCA sets the legal framework for environmental management basically as follows:

#### **a) Requirement for Environmental Impact Assessments for all new projects**

Section 58 of the Environmental Law requires that an Environmental Impact Assessment (EIA) study precede all development activities proposed to be implemented in Kenya. The Act further requires that EIA studies so designed, be executed in accordance with the Guidelines for Conduct of EIAs and Environmental Audits (Kenya Gazette Supplement No. 56 of 13th June 2003) as published by the National Environmental Management Authority (NEMA). It is for this reason that CWSB instructed the consultant to carry out an environmental and social impact assessment on the project. CWSB ensures that for all proposed projects an environmental and social impact assessment is carried out

#### **b) Requirement for Annual Environmental Audits**

In order to mitigate and control environmental damage from ongoing projects, Sections 68 and 69 of the EMCA require that all ongoing projects be subjected to annual environmental audits as further expounded in Regulation 35 (1) and (2) of Legal Notice 101 of June 2003. CWSB is committed in ensuring environmental safeguard and requires consultants to submit quarterly and annual environmental audit reports for all on-going projects.

The Environmental Impact Assessment is guided by the Environmental Management and Coordination Act, 1999 through the National Environment Management Authority (NEMA) The preparation of the EIA study and subsequent approval procedures are set out in the EIA Study, legal notice 101 of 2003.

According to the regulations, an EIA study should incorporate but not limited to the following:-

- The proposed location of the project
- The objective of the project
- The technology, procedures and process to be used in the implementation of the project.
- The materials to be used in the construction and implementation of the project.
- The products and by-products and waste generated by the project.

- The environmental effects of the project including the socio-cultural impacts, effects and direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
- A concise description of national environmental legislative and regulatory framework, baseline information and any other information related to the project.
- A description of the potentially affected environment.
- Alternative technologies and processes available and reasons for preferring the chosen technology and processes.
- An analysis of alternatives including project sites, design and technologies and reasons for preferring the proposed site, design and technologies.
- An Environmental management plan proposing the measures for eliminating , minimizing or mitigating adverse impacts on the environment, including the cost, time frame and responsibility to implement the measures.
- The provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities.
- The measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies.
- An identification of gaps in the knowledge and uncertainties which were encountered in compiling the information.
- An economic and social analysis of the project.
- An indication of whether the environment of any other state is likely to be affected and the available alternative and mitigating measures.

**i) Environmental Impact Assessment and Audit Regulation 2003 (Legal Notice 101 of 2003)**

Environmental Impact Assessment is a tool for environmental conservation and has been identified as a key component in on-going project execution. Section 58 of the Environmental Management and Coordination Act (EMCA) Number 8 of 1999, Second Schedule 9(I), and Environmental (Impact Assessment and Audit) Regulation 2003, stipulate that both new and old projects must undergo Environmental Impact Assessment and Audits. This is necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment. There are many environmental problems and challenges in Kenya today among them land degradation, water management and environmental pollution. This is aggravated by lack of awareness and inadequate information amongst the public on the consequences of their interaction with the environment. According to Kenya Subsidiary Legislation, 2003 part V of the EIA and EA regulation, provides for environment Audit and monitoring. The policy recommends the need for enhanced reuse/recycling of residues including waste water and use of non-waste technologies. It recommends participation of stakeholders in the management of wastes within their localities. It encourages better planning in both urban and rural areas and provision of basic needs such as water, drainage and waste disposal facilities.

**ii) The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2013 (Gazette Notice No. 13211 of 2013)**

Pursuant to regulation 48 of the Environmental (Impact Assessment and Audit) Regulations, 2003, as read with paragraph 4 of the fifth schedule thereof. The Environmental Impact Assessment fees payable has been reviewed as follows:

0.1% of the total cost of the project to a minimum of KSh.10, 000 with no upper capping.

**iii) 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.

Everyone is required to refrain from any actions, which directly or indirectly cause water pollution, whether or not the water resource was polluted before the enactment of the Environmental Management and Coordination Act (EMCA) gazetted in 1999. It is an offence to contravene the provisions of these regulations with a fine not exceeding five hundred thousand shillings.

According to these regulations, "Every person shall refrain from any action which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act".

**iv) 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.

The regulation requires licensing of transporters of wastes and operators of disposal site (sections 7 and 10 respectively). In section 14 (1) every trade or industrial undertaking is obliged to install anti-pollution equipment for the treatment of waste emanating from such trade or industrial undertaking. The Developer shall ensure that the garbage collector contracted has a valid license from the National Environment Management Authority (NEMA).

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

These Regulations determine that no person or activity shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may 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.

These regulations also relate noise to its vibration effects and seek to ensure no harmful vibrations are caused by controlling the level of noise. Any person(s) intending to undertake activities in which noise is suspected to be injurious or endangers the comfort, repose, health or safety of others and the environment must make an application to NEMA and acquire a license subject to payment of requisite fees and meeting the license conditions. Failure to comply with these regulations attracts a fine of KES 350,000 or 18 months jail term or both.

#### **vi) 5.2.6 Draft Environmental Management and Coordination (Air Quality) Regulations, 2008**

The objective of these Regulations is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. The general prohibitions state that no person shall cause the emission of air pollutants listed under First Schedule (Priority air pollutants) to exceed the ambient air quality levels as required stipulated under the provisions of the Seventh Schedule (Emission limits for controlled and non-controlled facilities) and Second Schedule (Ambient air quality tolerance limits)

#### **3.2.3 *Environmental Impact Assessment and Audit Regulation 2003 (Legal Notice 101 of 2003)***

Environmental Impact Assessment is a tool for environmental conservation and has been identified as a key component in on-going project execution. Section 58 of the Environmental Management and Coordination Act (EMCA) Number 8 of 1999, Second Schedule 9(i), and Environmental (Impact Assessment and Audit) Regulation 2003, stipulate that both new and old projects must undergo Environmental Impact Assessment and Audits. This is necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment. There are many environmental problems and challenges in Kenya today among them land degradation, water management and environmental pollution. This is aggravated by lack of awareness and inadequate information amongst the public on the consequences of their interaction with the environment. According to Kenya Subsidiary Legislation, 2003 part V of the EIA and EA regulation, provides for environment Audit and monitoring. The policy recommends the need for enhanced reuse/recycling of residues including waste water and use of non-waste technologies. It recommends participation of stakeholders in the management of wastes within their localities. It encourages better planning in both urban and rural areas and provision of basic needs such as water, drainage and waste disposal facilities.

#### **3.2.4 *The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2013 (Gazette Notice No. 13211 of 2013)***

Pursuant to regulation 48 of the Environmental (Impact Assessment and Audit) Regulations, 2003, as read with paragraph 4 of the fifth schedule thereof. The Environmental Impact Assessment fees payable has been reviewed as follows:

0.1% of the total cost of the project to a minimum of KSh.10, 000 with no upper capping.

### **3.2.5 The Occupational Safety and Health Act, 2007**

This is an Act of Parliament to provide for the safety, health and welfare of all workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes.

It applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of this Act is to:

- Secure the safety, health and welfare of persons at work; and
- Protect persons other than persons at work against safety and health arising out of, or in connection with the activities of persons at work.

The Occupational Safety and Health Act 2007 (OSHA 2007) revokes the Factories and Other Places of Work Cap.514. However sections of the Factories and Other Places of Work that are not inconsistent with those of OSHA 2007 remain applicable.

The scope of OSHA 2007 has been expanded to cover all workplaces including offices, schools, academic institutions and plantations. It establishes codes of practices to be approved and issued by the Director, Directorate of Occupational Health and Safety (DOHS) for practical guidance of the various provisions of the Act.

Other parameters within the Act include:

- Duties of employers, owners or occupiers of workplace;
- Establishment of safety and health committees;
- Annual safety and health audit of workplaces;
- Safety and Health obligations for persons who may come to premises for work and are not employees of that particular workplace;
- Reporting of any accident, dangerous occurrence or occupational poisoning caused in the workplace to the area Occupational Health and Safety Office. These incidents should be entered in the General Register. In case of a fatal accident information to the area Safety and Health Office should be within 24 hrs. and a written notice to the same within 7 days;
- The duties of manufactures, designers, importers and suppliers to ensure that all articles and substances for use at workplace are safe and will not cause injury to health and the environment;
- Duties of self-employed persons;
- Duties of employed persons;
- Prohibition of interference or misuse any appliance, convenience or any other facility provided to secure Safety, Health and Welfare at work by any person (occupier, self-employed person or employed);
- The administration of the Act is the responsibility of a Director and other appointed and gazetted officials (Occupational Health and Safety Officers);
- The establishment of National Council for Occupational Safety and Health to assist the Director to discharge his duties and those that may be required by the Minister;



- The registration of all workplaces by the Director DOHS forming the basis of his work statistics;
- Machinery safety to include:
  - Safe use of machinery, plant and equipment;
  - Prime makers and transmission machines;
  - The maintenance, construction of fencing safeguards;
  - The statutory requirements of various machines, plants and equipment (hoists and lifts, chains and ropes, cranes, steam receivers and containers, air receivers, cylinders for compressed liquefied and dissolve gases and refrigeration plants).
- Chemical safety including:
  - Handling, transportation and disposal of chemicals and other hazardous substances;
  - Importance of Materials Safety Data Sheets (MSDS);
  - Labelling and marking of chemical substances;
  - Classification of hazardous chemicals and substances;
  - Establishment and adoption of exposure limits on hazardous substances in a workplace;
  - Control of air pollution, noise and vibrations;
  - Redeployment on medical advice.
- Health, safety and welfare special provision including:
  - Permit to Work systems;
  - Work processes that are likely to harm persons below eighteen (18) years;
  - Supervision of apprentices and indentured learners;
  - Training and supervision of inexperienced workers;
  - Medical surveillance.
- Penalties, offences and legal proceedings including:
  - The upward adjustments of all fines imposed in the event of failure to comply with provisions of the Act;
  - The need to investigate and prosecute the real offender otherwise all those who fail to comply with any provisions of this Act that have been legally imposed on him/her shall be prosecuted.
  - The establishment of the safety and Health fund and Safety and Health regulations and procedures thereof.
  - The establishment of provisions as to the conduct of business and affairs of the National Council for Safety and Health under Third Schedule.

### **3.2.6 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. Any noxious matter or waste water flowing or

discharged into a water course is deemed as a nuisance. Part XII 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.

### **3.2.7 Water Act, 2002**

This is an Act of Parliament to provide for the management, conservation, use and control of water resources; and for the acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services; to repeal the Water Act (cap 372) and certain provisions of the Local Government Act; and for related purposes.

Part II of the Act deals with ownership and control of water. Every water resource is vested in the State and subject to rights of user granted by or under the Act. The Minister in charge has control over every water resource.

Part III of the Act defines the powers of the Water Resources Management Authority (WRMA).

The Water Act 2002 also provides the basis for the following:

- Formulation of a National Water Resources Management Strategy;
- Classification of water resources and resource quality objectives;
- Determination of water reserves;
- Designation of catchment areas;
- Formulation of a catchment management strategy;
- Declaration of protected catchment areas national monitoring of and Information on water resource management;
- Definition of state schemes and community projects.

Part IV of the Water Act defines the other regulatory bodies and modalities as follows:

- Water Services Regulatory Board;
- Water Services Strategy;
- Water Services Board and Water Service Providers;
- Provision of water services;
- Powers and duties of licenses of water services provided.

Section 94 of the Act states that:

No person shall .....or throw or convey, or cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive or unwholesome matter or thing into or near to any water resource in such manner as to cause, or likely to cause, pollution of the water resource.

Other Sections of the Act are as outlined below:

- Part V - Financial Provisions;
- Part VI - General and Supplementary: has a provision for the Water appeal Board, Entry on to land, miscellaneous, repeals, savings and transitional provisions.

The Second Schedule of the Water Act outlines conditions relating to construction works.

### **3.2.8 Lakes and Rivers Act**

This Act (Cap 409, rev 1983) makes provisions for the protection of birds and other wildlife in or on lakes and rivers.'

### **3.2.9 The Territorial Waters Act**

This is an Act of parliament to make provision for the delimitation of the territorial waters of Kenya and for purposes incidental thereto.

### **3.2.10 The Continental Shelf Act**

This is an Act of Parliament that vests rights in the Government in respect of the natural resources of the continental shelf, and to provide to matters incidental thereto and connected therewith.

It gives specifications for Kenyan courts on handling of acts, omissions, questions and disputes that occur within the area of the continental shelf.

The regulation would be relevant to disposal of sewage into the ocean through fall out points.

### **3.2.11 The Maritime Zones Act**

An act of parliament to consolidate the law relating to the territorial waters and continental shelf of Kenya; to provide for the establishment and delimitation of the exclusive economic zone of Kenya; to provide for the exploration, exploitation, conservation and management of the resources of the maritime zones and for connected purposes.

The regulation would be relevant to disposal of sewage into the ocean through fall out points.

### **3.2.12 The HIV and Aids Prevention and Control Act**

This Act commenced in March of 2009. It 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.

The object and purpose of this Act is to-

- a) Promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS;
- b) Extend to every person suspected or known to be infected with HIV and AIDS full protection of his human rights and civil liberties by-
  - Prohibiting compulsory HIV testing save as provided in this Act;
  - Guaranteeing the right to privacy of the individual;
  - Outlawing discrimination in all its forms and subtleties against persons with or persons perceived or suspected of having HIV and AIDS;

Ensuring the provision of basic health care and social services for persons infected with HIV and AIDS;

- a) Promote utmost safety and universal precautions in practices and procedures that carry the risk of HIV transmission; and
- b) Positively address and seek to eradicate conditions that aggravate the spread of HIV infection.

In this Act, unless the context otherwise requires-

- "Acquired Immune Deficiency Syndrome (AIDS)" means a condition characterized by a combination of signs and symptoms, resulting from depletion of the immune system caused by infection with the Human Immuno- Deficiency Virus (HIV);
- "anonymous testing" means an HIV testing procedure whereby the person being tested does not reveal his true identity but instead, an identifying number or symbol is used which allows the testing centre and the tested person to match the test results with the identifying number or symbol;
- "Human Immunodeficiency Virus (HIV)" means the virus which causes AIDS;
- "Person with HIV and AIDS" means a person whose HIV test indicates, directly or indirectly, that he is infected with HIV and AIDS;
- "Positive", in relation to the result of an HIV test, means a result which shows that the person who is tested is infected with HIV or which shows evidence of such infection;
- "Post exposure prophylaxis" means the administration of one or a combination of anti-retroviral drugs after probable exposure to HIV, for the purpose of preventing transmission;
- "post-test counselling" refers to the process of providing a person who submitted themselves for an HIV test with risk-reduction information and emotional support at the time the test result is released;
- "pre-test counselling" means the process of providing a person, before such person undergoes an HIV test, with information on the biomedical aspects of HIV and AIDS and emotional support with respect to the psychological implications of undergoing an HIV test;
- "self-testing" in relation to HIV infection, means a prescribed test or series of tests carried out entirely by a person on self without the involvement of another person, which determine whether a person is infected with HIV;
- "Testing centre" means a testing centre approved by the Minister under section 16;

Part II of the Act stipulates as follows:

4. (1) The Government shall promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS through a comprehensive nationwide educational and information campaign conducted by the Government through its various Ministries, Departments, authorities and other agencies.

(2) The educational and information campaign referred to in subsection (1) shall-

- a) Employ scientifically proven approaches;
- b) Focus on the family as the basic social unit;
- c) Encourage testing of individuals; and
- d) be carried out in schools and other institutions of learning, all prisons, remand homes and other places of confinement, amongst the disciplined forces, at all places of work and in all communities throughout Kenya.

In Part IV - Testing, Screening and Access Health Care Services, it states as follows:-

13. (1) Subject to this Act, no person shall compel another to undergo an HIV test.

(2) Without prejudice to the generality of subsection (1), no person shall compel another to undergo an HIV test as a precondition to, or for continued enjoyment of-

- a) Employment;
- b) Marriage;
- c) Admission into any educational institution;
- d) Entry into or travel out of the country; or
- e) The provision of healthcare, insurance cover or any other service.

(3) Notwithstanding the provisions of subsection (1), a person charged with an offence of a sexual nature under the Sexual Offences Act, 2006 may be compelled to undergo an HIV test.

(4) A person who contravenes any of the provisions of this section commits an offence.

16. (1) No person shall carry out an HIV test except in a testing center approved by the Minister under this section or in the manner specified under paragraph (d) of subsection (4).

(2) No person shall carry out an HIV test unless such person is a healthcare provider approved by the Minister for that purpose.

(3) No person shall provide pre-test or post-test counseling for the purposes of section 17 unless such person is approved by the Minister under this section.

17. (1) Every testing center shall provide pre-test and post-test counseling to a person undergoing an HIV test and any other person likely to be affected by the results of such test.

18. The results of an HIV test shall be confidential and shall only be released-

- a) To the tested person;
- b) In the case of a child, to a parent or legal guardian of such child;

Provided that where any such child consents to an HIV test directly under section 14(1)(b), the results thereof shall be released to the child; or

(c) In the case of a person with a disability which, in the opinion of the medical practitioner undertaking the test, renders him incapable of comprehending such result to-

- i) The guardian of that person;
- ii) A partner of that person;
- iii) A parent of that person; or
- iv) An adult offspring of that person

#### In Part V – Confidentiality,

(2) No person shall record, collect, transmit or store records, information or forms in respect of HIV tests or related medical assessments of another person otherwise than in accordance with the privacy guidelines prescribed under this section.

22. (1) No person shall disclose any information concerning the result of an HIV test or any related assessments to any other person except-

- a) With the written consent of that person;
- b) If that person has died, with the written consent of that person's partner, personal representative, administrator or executor;
- c) If that person is a child, with the written consent of a parent or legal guardian of that child:

#### Part VI - Transmission of HIV

24. (1) A person who is and is aware of being infected with HIV or is carrying and is aware of carrying the HIV virus shall-

- a) Take all reasonable measures and precautions to prevent the transmission of HIV to others; and
- b) Inform, in advance, any sexual contact or person with whom needles are shared of that fact.

(2) A person who is and is aware of being infected with HIV or who is carrying and is aware of carrying HIV shall not, knowingly and recklessly, place another person at risk of becoming infected with HIV unless that other person knew that fact and voluntarily accepted the risk of being infected.

(3) A person who contravenes the provisions of subsections (1) or (2) commits an offence and shall be liable upon conviction to a fine not exceeding five hundred thousand shillings or to imprisonment for a term not exceeding seven years, or to both such fine and imprisonment.

(4) A person referred to in subsection (1) or (2) may request any medical practitioner or any person approved by the Minister under section 16 to inform and counsel a sexual contact of the HIV status of that person.

(5) A request under subsection (4) shall be in the prescribed form.

#### Part VIII - Discriminatory Acts and Policies

31. (1) Subject to subsection (2), no person shall be-

- a) Denied access to any employment for which he is qualified; or
- b) Transferred, denied promotion or have his employment terminated, on the ground only of his actual, perceived or suspected HIV status.

(2) Subsection (1) shall not apply in any case where an employer can prove, on application to the Tribunal that the requirements of the employment in question are that a person be in a particular state of health or medical or clinical condition.

33. (1) A person's freedom of abode, lodging, or travel, within or outside Kenya shall not be denied or restricted on the grounds only of the person's actual, perceived or suspected HIV status.

(2) No person shall be quarantined, placed in isolation, refused lawful entry or deported from Kenya on the grounds only of the person's actual, perceived or suspected HIV status.

34. No person shall be denied the right to seek an elective or other public office on the grounds only of the person's actual, perceived or suspected HIV status.

35. (1) Subject to this Act, no person shall be compelled to undergo a HIV test or to disclose his HIV status for the purpose only of gaining access to any credit or loan services, medical, accident or life insurance or the extension or continuation of any such services.

(2) Notwithstanding the provisions of subsection (1), an insurer, re-insurer or health maintenance organization shall, in the case of life and healthcare service insurance cover, devise a reasonable limit of cover for which a proposer shall not be required to disclose his or her HIV status.

(3) Where a proposer seeks a cover exceeding the no test limit prescribed under subsection (2) the insurer, reinsurer or health maintenance organization may, subject to this Act, require the proposer to undergo an HIV test.

### **3.2.13 The Land Act, No. 6 Of 2012**

Under section 19. (1) The Commission shall make rules and regulations for the sustainable conservation of land based natural resources.

(2) Without limiting what the Commission may prescribe under subsection (1), the rules and regulations may contain;

- a) Measures to protect critical ecosystems and habitats;
- b) Incentives for communities and individuals to invest in income generating natural resource conservation programs;
- c) Measures to facilitate the access, use and co- management of forests, water and other resources by communities who have customary rights to these resources;
- d) Procedures for the registration of natural resources in an appropriate register;
- e) Procedures on the involvement of stakeholders in the management and utilization of land- based natural resources; and
- f) Measures to ensure benefit sharing to the affected communities.

#### **i) Land registration under land act, 2012**

Under section 5 (1) of the land act, 2012 there shall be the following forms of land tenure-

- a) Freehold;
- b) Leasehold;
- c) Such forms of partial interest as may be defined under this Act and other law, including but not limited to easements; and
- d) Customary land rights, where consistent with the Constitution.

(2) There shall be equal recognition and enforcement of land rights arising under all tenure systems and non-discrimination in ownership of, and access to land under all tenure systems.

Title to land may be acquired through;

- a) Allocation;
- b) Land adjudication process;
- c) Compulsory acquisition;
- d) Prescription;
- e) Settlement programs;
- f) Transmissions;
- g) Transfers;
- h) long term leases exceeding twenty one years created out of private land; or
- i) Any other manner prescribed in an Act of Parliament.

Under section 8 (a), the Land Commission shall identify public land, prepare and keep a database of all public land, which shall be geo-referenced and authenticated by the statutory body responsible for survey;

(d) May require the land to be used for specified purposes and subject to such conditions, covenants, encumbrances or reservations as are specified in the relevant order or other instrument.

Section 9 (1) states that any land may be converted from one category to another in accordance with the provisions of this Act or any other written law.

(2) Without prejudice to the generality of subsection (1);

- a) Public land may be converted to private land by alienation;

- b) Subject to public needs or in the interest of defense, public safety, public order, public morality, public health, or land use planning, public land may be converted to community land;
- c) Private land may be converted to public land by;
  - o Compulsory acquisition;
  - o Reversion of leasehold interest to Government after the expiry of a lease; and
  - o Transfers; or
  - o Surrender.

(d) Community land may be converted to either private or public land in accordance with the law relating to community land enacted pursuant to Article 63(5) of the Constitution.

(3) Any substantial transaction involving the conversion of public land to private land shall require approval by the National Assembly or county assembly as the case may be.

#### **ii) Way leaves under land act, 2012**

Subject to and in accordance with section 143 (1) and section 146, the Commission may, create a right of way which shall be known as public right of way.

144.(1) Unless the Commission is proposing on its own motion to create a way leave, an application, for the creation of a wayleave , shall be made by any State department, or the county government, or public authority or corporate body, to the Commission.

(2) An application shall be made in the prescribed form and shall be accompanied by any prescribed information or other information that the Commission may, in writing require the applicant to supply and the Commission shall not begin the process of creating a wayleave until all prescribed or required information has been submitted to it.

(3) In order to enable a proposed wayleave to be created by the Commission of its own motion to comply with the provisions of this section, the Commission shall complete an application form as if it were applying to create a wayleave and references to "the applicant" in this Sub-part in relation to an application to create a wayleave shall be taken to apply as well to the Commission.

(4) The applicant shall serve a notice on:

- a) all persons occupying land over which the proposed wayleave is to be created, including persons occupying land in accordance with customary pastoral rights;
- b) The county government in whose area of jurisdiction land over which the proposed wayleave is to be created is located;
- c) All persons in actual occupation of land in an urban and per-urban area over which the proposed wayleave is to be created; and
- d) Any other interested person.

(5) The Commission shall publish the application along the route of the proposed wayleave calculated to bring the application clearly and in a comprehensible manner to the notice of all persons using land over which the proposed wayleave is likely to be created.

A county government, an association, or any group of persons may make an application to the commission for a communal right of way on accordance to section 145 (1).



### **iii) Land acquisition under land acts 2012**

Under section 110 (1) of Land Acts 2012 Land may be acquired compulsorily under this Part if the Commission certifies, in writing, that the land is required for public purposes or in the public interest as related to and necessary for fulfillment of the stated public purpose.

Part 2 of this section states that if, after land has been compulsorily acquired the public purpose or interest justifying the compulsory acquisition fails or ceases, the Commission may offer the original owners or their successors in title pre-emptive rights to re-acquire the land, upon restitution to the acquiring authority the full amount paid as compensation.

Section 111 (1) states that if land is acquired compulsorily under this Act, just compensation shall be paid promptly in full to all persons whose interests in the land have been determined. The commission shall make rules to regulate the assessment of just compensation.

Likewise where land is acquired compulsorily, full compensation shall be paid promptly to all persons affected in accordance to section 113 (1). (2) Subject to Article 40 (2) of the Constitution and section 122 and 128 of this Act, an award-

- a) Shall be final and conclusive evidence of-
  - o The size of the land to be acquired;
  - o The value, in the opinion of the Commission, of the land;
  - o The amount of the compensation payable, whether the persons interested in the land have or have not appeared at the inquiry; and
- b) Shall not be invalidated by reason only of a discrepancy which may thereafter be found to exist between the area specified in the award and the actual area of the land.

Section 124 of the Act allows for the temporary acquisition of land for public purpose or public interest; or for, the possession of the land is necessary in the interests of defense, public safety, public order, public morality, public health, urban and planning, or the development or utilization of any property in such manner as to promote the public benefit; for utilization in promotion of the public good for periods not exceeding 5 years. At the expiry of the period, the Commissioner of Land shall vacate the land and undertake to restore the land to the conditions it was before as per section 125. The compensation to be paid under section 120 shall be limited to the damage done to trees, plants, growing crops and permanent improvements on the land, together with a periodical sum for diminution in the profits of the land and of adjoining land by reason of that use.

148. (1) Subject to the provisions of this section, compensation shall be payable to any person for the use of land, of which the person is in lawful or actual occupation, as a communal right of way and, with respect to a wayleave, in addition to any compensation for the use of land for any damage suffered in respect of trees crops and buildings as shall, in cases of private land, be based on the value of the land as determined by a qualified valuer.

(2) Compensation relating to a wayleave or communal right of way shall not be paid to a public body unless there is a demonstrable interference of the use of the land by that public body.

(3) Damage caused as a result of the creation of a wayleave shall include any preliminary work undertaken in connection with surveying or determining the route of that wayleave,

### **3.2.14 The County Governments Act, 2012**

This is an act of Parliament to give effect to Chapter Eleven of the Constitution; to provide for county governments powers, functions and responsibilities to deliver services and for connected purposes

According to section 103 the objectives of county planning shall be to;

- a) Protect the historical and cultural heritage, artefacts and sites within the county; and
- b) Make reservations for public security and other critical national infrastructure and other utilities and services;
- c) work towards the achievement and maintenance of a tree cover of at least ten per cent of the land area of Kenya as provided in Article 69 of the Constitution; and
- d) Develop the human resource capacity of the county.

Under section 104, (1) a county government shall plan for the county and no public funds shall be appropriated outside a planning framework developed by the county executive committee and approved by the county assembly.

(2) The county planning framework shall integrate economic, physical, social, environmental and spatial planning.

(3) The county government shall designate county departments, cities and urban areas, sub-counties and Wards as planning authorities of the county.

(4) To promote public participation, non-state actors shall be incorporated in the planning processes by all authorities.

Under section 111, (1) for each city and municipality there shall be; the

- a) City or municipal land use plans;
- b) City or municipal building and zoning plans;
- c) City or urban area building and zoning plans;
- d) Location of recreational areas and public facilities.

(2) A city or municipal plans shall be the instrument for development facilitation and development control within the respective city or municipality.

(3) A city or municipal plan shall, within a particular city or municipality, provide for;

- a) Functions and principles of land use and building plans;
- b) Location of various types of infrastructure within the city or municipality;
- c) Development control in the city or municipality within the national housing and building code framework.

(4) City or municipal land use and building plans shall be binding on all public entities and private citizens operating within the particular city or municipality.

(5) City or municipal land use and building plans shall be the regulatory instruments for guiding and facilitating development within the particular city or municipality.

(6) Each city or municipal land use and building plan shall be reviewed every five years and the revisions approved by the respective county assemblies.

Under section 115, (1) Public participation in the county planning processes shall be mandatory and be facilitated through;

(b) Provision to the public of clear and unambiguous information on any matter under consideration in the planning process, including;

- i) clear strategic environmental assessments;

- ii) Clear environmental impact assessment reports;
- iii) Expected development outcomes; and
- iv) Development options and their cost implications.

(2) Each county assembly shall develop laws and regulations giving effect to the requirement for effective citizen participation in development planning and performance management within the county and such laws and guidelines shall adhere to minimum national requirements.

**i) The Physical Planning Act (CAP 286) 2010**

Under the Physical Planning Act, physical development activities are supposed to be carried out according to the physical plans. The Act provides for the preparation and implementation of physical development plans and for related purposes. It gives provisions for the development of local physical development plan for guiding and coordinating development of infrastructure facilities and services within the area of authority of County, municipal and town council and for specific control of the use and development of land.

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 industrial location, dumping site, sewerage treatment, quarries 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”.

The site layout plan appended to this report shows the route of the entire project route. The proponent shall secure all mandatory approvals and permits as required by the law.

**ii) 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. Any noxious matter or waste water flowing or discharged into a water course is deemed as a nuisance. Part XII 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.

The Act places responsibility for protection of water supplies from any pollution dangerous to health on the local authorities. The Act empowers the Minister for Health to make rules and impose on local authorities and others, the duty of enforcing such rules.

**3.2.15 *The Constitution of Kenya 2010***

**i) Environmental obligations and rights**

Article 42 states that every person has the right to a clean and healthy environment, which includes the right; (a) to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and

(b) To have obligations relating to the environment fulfilled under Article 70.

Section 43 (d) every person has the right to clean and safe water in adequate quantities;

Under Article 69 (1) The State shall:

- a) ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
- b) Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;
- c) Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
- d) Encourage public participation in the management, protection and conservation of the environment;
- e) Protect genetic resources and biological diversity;
- f) Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
- g) Eliminate processes and activities that are likely to endanger the environment; and
- h) Utilize the environment and natural resources for the benefit of the people of Kenya.

(2) Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

70. (1) If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.

(2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate

- a) to prevent, stop or discontinue any act or omission that is harmful to the environment;
- b) To compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or
- c) To provide compensation for any victim of a violation of the right to a clean and healthy environment.

(3) For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.

## **ii) Classification of land**

Under Article 61 (1) all land in Kenya belongs to the people of Kenya collectively as a nation, as communities and as individuals.

(2) Land in Kenya is classified as public, community or private.

62. (1) Public land is

- a) land which at the effective date was alienated government land as defined by an Act of Parliament in force at the effective date;
- b) Land lawfully held, used or occupied by any State organ, except any such land that is occupied by the State organ as lessee under a private lease;
- c) Land transferred to the State by way of sale, reversion or surrender;
- d) Land in respect of which no individual or community ownership can be established by any legal process;
- e) Land in respect of which no heir can be identified by any legal process
- f) All minerals and mineral oils as defined by law;

- g) government forests other than forests to which Article 63 (2)(d) (i) applies, government game reserves, water catchment areas, national parks, government animal sanctuaries, and specially protected areas;
- h) All roads and thoroughfares provided for by an Act of Parliament;
- i) All rivers, lakes and other water bodies as defined by an act of parliament;
- j) The territorial sea, the exclusive economic zone and the sea bed;
- k) The continental shelf;
- l) All land between the high and low water marks;
- m) Any land not classified as private or community land under this Constitution; and
- n) Any other land declared to be public land by an Act of Parliament; (i) in force at the effective date; or (ii) enacted after the effective date.

(4) Public land shall not be disposed of or otherwise used except in terms of an Act of Parliament specifying the nature and terms of that disposal or use.

Section 63 (1) Community land shall vest in and be held by communities identified on the basis of ethnicity, culture or similar community of interest.

(3) Any unregistered community land shall be held in trust by county governments on behalf of the communities for which it is held.

(4) Community land shall not be disposed of or otherwise used except in terms of legislation specifying the nature and extent of the rights of members of each community individually and collectively.

64. Private land consists of;

- a) registered land held by any person under any freehold tenure;
- b) Land held by any person under leasehold tenure; and
- c) Any other land declared private land under an Act of Parliament.

### **3.2.16 National Legal Provisions on Gender**

Gender issues in the country are institutionalized through:

- The current newly enacted Constitution;
- Vision 2030 Flagship projects;
- The Presidential Directive of 2006 on 30% women's' appointments to all positions of leadership employment and promotions;
- The National Gender Policy 2000;
- Sessional Paper No.2 of 2006;
- Gender Department in the Ministry for Gender Children and Social Development;

The National Commission on Gender and Development enacted through an Act of Parliament in 2003 is mandated to Monitor Government Implementation of its Commitments to Women's Rights and Gender issues

Employment Act, No. 11 of 2007: the Act prohibits discrimination in access to employment and in employment security on the basis of sex, among others:

- Guarantees equality of opportunity in employment
- Provides for equal pay for work of equal value

- Prohibits sexual harassment which the law defines to include use of language, whether written or spoken, of a sexual nature

A National Framework on Gender-based Violence. The government through the National Commission on Gender and Development has developed a National Framework on Gender Based Violence (February 2009) to form that basis of investigation of instances of sexual violence and strengthen coordination of responses to stem the vice

Launch of same on 09.11.2009 by Minister for Gender, children and social development

The Sexual Offences Bill

FGM Policy being developed

#### **i) National Gender and Development Policy (2000)**

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 utilization 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.

The Policy's concerns cover the following critical areas:

- i) The Economy;-To enable men and women to have equal access to economic and employment opportunities.
- ii) Poverty and Sustainable Livelihoods; - To remove obstacles to women's access to and control over productive assets, wealth and economic opportunities, shelter, safe drinking water, and promote measures for conserving the environment.
- iii) Law; - To guarantee Kenyan men and women equality before the law, as provided for in the Constitution and under the obligations of the Kenyan State in international law.
- iv) Political Participation and Decision- Making; - To enhance gender parity in political participation and decision - making
- v) Education and Training; - To enhance and sustain measures to eliminate gender disparities in access, retention, transition and performance in education for both boys and girls
- vi) Health and Population; - To achieve the highest attainable standard of health for both men and women through addressing gender inequalities pertaining to access and use of basic health services and facilities at an affordable cost.
- vii) The Media; - To increase the participation of women in the media and communications sector and promote gender sensitive portrayal of both men and women in the media
- viii) Policy Implementation Framework and Resource Mobilization- empowering both men and women to be equal partners in development- It focuses on the elimination of existing disparities between the two genders. It also advocates for an affirmative

action to address gender disparities.

**ii) The New Constitution of August 2010 on Gender**

In the New Constitution, Chapter Four—The Bill of Rights,

Section 21 (3) All State organs and all public officers have the duty to address the needs of vulnerable groups within society, including women, older members of society, persons with disabilities, children, youth, members of minority or marginalized communities, and members of particular ethnic, religious or cultural communities

Section 27 (3) Women and men have the right to equal treatment, including the right to equal opportunities in political, economic, cultural and social spheres.

Part 2 on the Composition and Membership of Parliament,

Section 97 (1) The National Assembly consists of, a) two hundred and ninety members, each elected by the registered voters of single member constituencies; (b) forty-seven women, each elected by the registered voters of the counties, each county constituting a single member constituency;

Section 98. (1) The Senate consists of— (a) forty-seven members each elected by the registered voters of the counties, each county constituting a single member constituency; (b) sixteen women members who shall be nominated by political parties according to their proportion of members of the Senate elected under clause (a) in accordance with Article 90; (c) two members, being one man and one woman, representing the youth; (d) two members, being one man and one woman, representing persons with disabilities;

Section 100 Parliament shall enact legislation to promote the representation in Parliament of—

(a) Women;

Section 127 (1) There is established the Parliamentary Service Commission.

(2) The Commission consists of—

- a) The Speaker of the National Assembly, as chairperson;
- b) A vice-chairperson elected by the Commission from the members appointed under paragraph
- c) Seven members appointed by Parliament from among its members of whom—
  - i) Four shall be nominated equally from both Houses by the party or coalition of parties forming the national government, of whom at least two shall be women;

In Chapter Thirteen, on the Public Service, Part 1—Values and Principles of Public Service

Section 232 (1) the values and principles of public service include—(i) affording adequate and equal opportunities for appointment, training and advancement, at all levels of the public service, of—

- i) Men and women;
- ii) The members of all ethnic groups; and
- iii) Persons with disabilities.

Section 232 (2) the values and principles of public service apply to public service in—

- a) All State organs in both levels of government; and
- b) All State corporations

(3) Parliament shall enact legislation to give full effect to this Article.

In the composition, appointment and terms of office, the new constitution says that the chairperson and vice-chairperson of a commission shall not be of the same gender.

In addition clause (8) says that the State shall take legislative and other measures to implement the principle that not more than two-thirds of the members of elective or appointive bodies shall be of the same gender.

The new constitution provides for the elimination of gender discrimination in law, customs and practices related to land and property. Under Kenya's previous law, inheritance was governed by customary law, often preventing women from inheriting property from their parents or laying claim to joint assets when their husbands' died.

In summary, the New Constitution provides as follows-

The New Kenyan Constitution ensures that women will be able to pass on citizenship to their children regardless of whether or not they are married to Kenyans. Article 14 (1)

The New Kenyan Constitution provides that parties to a marriage will be entitled to equal rights at the time of marriage, during the marriage and at its dissolution. Article 45 (3)

The New Kenyan Constitution assures that parental responsibility shall be shared between parents regardless of marital status. Article 53 (1) (e).

The New Kenyan Constitution eliminates gender discrimination in relation to land and property and gives everyone including women the right to inheritance and unbiased access to land. Article 60 (1) (f).

The New Kenyan Constitution provides for the enactment of legislation for the protection of matrimonial property with special interest on the matrimonial home during, and upon the termination of the marriage. Article 68 (c) (iii).

The New Kenyan Constitution maintains a one third requirement for either gender in elective bodies giving women of Kenya at least 1/3 minimum in elective public bodies. Article 81 (b).

The New Kenyan Constitution ensures that gender equality is maintained in political parties providing a basic requirement for political parties as amongst other to respect and promote gender equality. Article 91 (f)

The New Kenyan Constitution provides that Parliament shall formulate law to promote the representation of women, persons of disabilities, ethnic and other minorities and marginalized communities in Parliament. Article 100.

The New Kenyan Constitution ensures that women and men will have the right to equal treatment and opportunities in political, economic, cultural and social spheres without discrimination. Article 27 (3).

The New Kenyan Constitution accords the right to health including reproductive health to all. Article 43 (1) (a).

The New Kenyan Constitution affords adequate and equal opportunities for appointment, training and advancement for women and men at all levels within the Public Service Commission. Article 232 (i).

### **iii) The Sexual Offences Act (NO 3 of 2006)**

Relevant Sections include:-



24- Sexual offences relating to position of authority and persons in position of trust.

25- Sexual relationship which pre-date position of authority or trust.

26- Deliberate transmission of HIV or any other life threatening sexually transmitted disease.

### **3.2.17 Relevant Sectorial Legislation**

While the EMCA supersedes all other environmental legislation, numerous other laws and regulations in addition to those described above influence the various aspects and activities of the Project, which include the following among others:

- Physical Planning Act (1996);
- Building Code (1997);
- Local Government Regulations (1963);
- Workmen's Compensation Act (rev.1988);
- Standards Act;
- Penal Code, Cap 63 (rev 1985);
- Use of Poisonous Substances Act, Cap 247 (rev 1983);
- Land Control Act Cap 302;
- Forestry Act Cap 385;
- Wildlife (Conservation and Management) Act Cap 376.

## **3.3 Institutional Framework**

### **3.3.1 Institutions under the EMCA 1999**

#### The National Environmental Council

The National Environmental Council (the Council) is responsible for policy formulation and directions for the purposes of the Act. The Council also sets national goals and objectives and determines policies and priorities for the protection of the environment.

#### The National Environmental Management Authority

The responsibility of the National Environmental Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of government in the implementation of all policies relating to the environment.

In addition to NEMA, the Act provides for the establishment and enforcement of environmental quality standards to be set by a technical committee of NEMA known as the Standards and Enforcement Review Committee (SERC).

#### County and Sub County Environmental Committees

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

- Representatives from all the ministries;
- Representatives from local authorities within the province/district;

- Two farmers / pastoral representatives;
- Two representatives from NGO's involved in environmental management in the province/district;
- A representative of each regional development authority in the province/district.

#### Public Complaints Committee

EMCA also establishes a Public Complaints Committee, which provides the administrative mechanism for addressing environmental harm. The committee has the mandate to investigate complaints relating to environmental damage and degradation. Its members include representatives from the Law Society of Kenya, NGO's and the business community.

### **3.3.2 Institutions under the Water Act 2002**

The main functions of the Ministry of Water and Irrigation are to develop and formulate Water Resources Management Policy, Water and Sanitation Services Policy, Water Quality and Pollution Control Policy, Flood Control and Land Reclamation Policy, Waste Water Treatment and Disposal Policy, National Irrigation Policy and a policy on Water Schemes and Community Water Projects.

The relevant institutional framework for water and sanitation in Kenya was set up under the Water Act 2002. Institutions under this Act are presented in the following sections.

#### Water Resources Management Authority

The Water Act 2002 provides for a Water Resources Management Authority (WRMA) to manage water in an integrated way. WRMA is charged with responsibility for managing, regulating, protecting, apportioning and conserving water resources naturally, including Trans boundary waters.

Some of these powers and functions of WRMA include:

- Developing principles, guidelines and procedures for the allocation of water resources;
- Monitoring the national water resources management strategy;
- Receiving and determining applications for permits for water use;
- Monitoring and enforcing conditions attached to permits for water use;
- Regulating and protecting water resources quality from adverse impacts;
- Managing and protecting water catchments.

WRMA may prosecute any offences arising under the Water Act.

### **3.3.3 Water Services Regulatory Board and Water Appeals Board**

The Water Services Regulatory Board (WSRB) and Water Appeals Board (WAB) are independent institutions to regulate and deal with disputes respectively. The WSRB regulates the seven Water Services Boards in Kenya. The Water Appeals Board is established with the responsibility of hearing and determining appeals concerning a permit or license.

### **3.3.4 Water Services Boards**

In the case of water supply and sewerage, the Act gives responsibility for service delivery to seven Water Services Boards one of which is the Coast Water Service Board (CWSB). The Boards In turn,

retain service provider(s) such as water companies, NGOs, institutions and community owned schemes.

CWSB's main responsibility is the provision of efficient and economical water and sanitation services to the people of the Coast region. Its area of jurisdiction coincides with the administrative boundaries of the Coast Province. This area covers twelve districts namely: Mombasa, Kilindini, Kilifi, Kaloleni, Kwale, Kinango, Msambweni, Tana River, Tana Delta, Taita, Taveta, Malindi and Lamu districts

Coast Water Services Board (CWSB) currently manages the bulk water supply system. However the formation of a Bulk Water Supply Company, to manage the Bulk Water Supply System, is at an advanced stage.

### **3.3.5 Water Service Providers**

These are mandated to provide day-to-day service within their areas of responsibilities. They include water companies, NGOs, institutions and community owned schemes.

The Water Companies in Coast Province are:

- Mombasa Water and Sewerage Company (MOWASCO)
- Malindi Water and Sewerage Company (MAWASCO)
- Kilifi-Mariakani Water and Sewerage Company (KIMAWASCO)
- Taita Taveta and Voi Water and Sewerage Company (TAVEVO)
- Lamu Water and Sewerage Company (LAWASCO)
- Kwale Water and Sewerage Company (KWAWASCO)

The CWSB is in negotiations with the Tana River District Councils to establish dedicated Water Services provision agent in this service area.

The MOWASCO WSP area is supplied with water from Mzima, Marere, Baricho and Tiwi Bulk Water Systems.

## **3.4 Regulatory Framework**

### **3.4.1 Environmental Regulations**

#### **i) Environmental Impact Assessment and Audit Regulations**

The Environmental Impact Assessment and Audit Regulations state in Regulation 3 that ".....the Regulations shall apply to all policies, plans, programs, projects and activities specified in Part IV, Part V and the Second Schedule of the EMCA....."

Regulation 4(1) further states that:

"...no proponent shall implement a project:

Likely to have a negative environmental impact; or

For which an environmental impact assessment is required under the Act or these Regulations;

Unless an environmental impact assessment has been concluded and approved in accordance with these Regulations..."

Where standards are yet to be established, the local authority standards or standards promulgated under sectorial legislation apply.

**ii) Environmental Management and Coordination, (Water Quality) Regulations 2006**

These are described in Legal Notice No. 120 of the Kenya Gazette Supplement No.68 of September 2006. These Regulations apply to drinking water, water used for agricultural purposes, water used for recreational purposes, water used for fisheries and wildlife and water used for any other purposes. This includes the following:

- Protection of sources of water for domestic use;
- Water for industrial use and effluent discharge;
- Water for agricultural use.

These Regulations outline:

- Quality standards for sources of domestic water;
- Quality monitoring for sources of domestic water;
- Standards for effluent discharge into the environment;
- Monitoring guide for discharge into the environment;
- Standards for effluent discharge into public sewers;
- Monitoring for discharge of treated effluent into the environment.

**iii) Environmental Management and Coordination, (Waste Management) Regulations 2006**

These rules are described in Legal Notice No. 121 of the Kenya Gazette Supplement No. 69 of September 2006. These Rules describe the following:

- Waste description;
- Waste transportation;
- Responsibility of waste transporters;
- Waste disposal facility;
- Description and handling of industrial wastes;
- Description and handling of hazardous and toxic wastes;
- Description and handling of pesticides and toxic substances;
- Description and handling of biomedical wastes;
- Description and handling of radioactive substances;
- List of schedules on waste management.

**iv) Fossil Fuel Emission Control Regulations 2006**

These regulations are described in Legal Notice No. 131 of the Kenya Gazette Supplement No. 74, October 2006. These regulations include internal combustion engine emission standards, emission inspections, the power of emission inspectors, fuel catalyts, licensing to treat fuel, cost of

clearing pollution and partnerships to control fossil fuel emissions. The fossil fuels considered are petrol, diesel, fuel oils and kerosene.

**v) Environmental Management and Coordination, (Conservation of Biological Diversity (BD) Regulations 2006)**

These regulations are described in Legal Notice No. 160 of the Kenya Gazette Supplement No. 84 of December 2006. These Regulations apply to conservation of biodiversity which includes conservation of threatened species, inventory and monitoring of BD and protection of environmentally significant areas, access to genetic resources, benefit sharing and offences and penalties.

**3.4.2 Occupational Health and Safety Regulations**

The Occupational Health and Safety Act (OSHA) 2007 repealed the Factories and Other Places of Work Act. Anything done under the provisions of the Factories and Other Places of Work Act or the Minister under the provisions of Factories and Other Places of Work Act, including subsidiary legislation issued before the commencement of the OSHA 2007 shall be deemed to have been done under the provisions of this Act.

The Factories and Other Places of Work Act had over the years passed several subsidiary rules and regulations for effective implementation of the Act. All shall, as long as it is not inconsistent with OSHA 2007 remain in force until repealed or revoked by subsidiary legislation under the provisions of OSHA 2007 and shall for all purposes be deemed to have been made under this Act.

These regulations include:

The Factories (Cellulose Solutions) Rules 1957;

The Factories (Wood Working Machinery) Rules 1959;

The Factories (Dock) Rules 1962;

The Factories (Eye Protection) Rules 1978

The Factories (Electric Power) (Special) Rules 1978;

The Factories (Building Operations and Works of Engineering Construction) Rules 1984;

The Factories and Other Places of Work (Health & Safety Committees) Rules 2004;

The Factories and Other Places of Work (Medical Examination) Rules 2005;

The Factories and Other Places of Work (Noise Prevention and Control) Rules 2005.

The Factories and Other Places of Work (Fire Risk Reduction) Rules 2007;

The Factories and Other Places of Work (Hazardous Substances) Rules 2007.

**3.5 World Bank Operational Policies**

**3.5.1 Operational Policy (OP) 4.01: Environmental Assessment, 2001**

This policy helps ensure the environmental and social soundness and sustainability of investment projects so as to ensure it doesn't negatively affect the environment. It also supports integration of environmental and social aspects of projects in the decision-making process. The policy requires

public consultation and disclosure for Category "A" and B projects which include Sewerage systems. In our case the case project is a category B project.

According to the policy, objectives of disclosure & consultation include:

To enable affected groups and interested parties (emphasis on NGOs) to understand likely implications of project;

To enable affected groups and interested parties have input into project design.

Public consultations in this case was done in form of structured questionnaires which were taken from door to door my enumerators and results analyzed by the consultant.

### **3.5.2 Operational Policy 4.04: Natural Habitats, 2001**

The policy seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy Promotes environmentally sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions.

### **3.5.3 Operational Policy (OP) 4.10 - Indigenous Peoples, 2005**

This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. For all projects that are proposed for Bank financing and affect Indigenous peoples the Bank requires the borrower to engage in a process of free, prior, and informed consultation. The provide financing only where free, prior, and informed consultation results in broad community support to the project by the affected Indigenous Peoples. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Bank-financed projects are also designed to ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and intergenerationally inclusive.

### **3.5.4 Operational Policy (OP/BP) 4.11: Physical Cultural Resources, 2006**

The objective of this policy is to assist countries in preserving physical cultural resources and avoiding their destruction or damage. PCR are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious (including graveyards and burial sites), aesthetic, or other cultural significance. PCR may be located in urban or rural settings, and may be above ground, underground, or under water. The cultural interest may be at the local, provincial or national level, or within the international community. This policy applies to all projects requiring a category A or B environmental assessment, project located in, or in the vicinity of recognized cultural heritage sites. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices

### **3.5.5 The Bank's Operational Policy 4.12: Involuntary Resettlement, 2001**

This occurs in situations where people have settled on land that is designated and protected for other activities other than settlements and hence posing 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 impact and where not feasible assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

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.

### **3.5.6 Operation policy (Op/Bp) 4.36: Forestry**

The objective of this policy is to realize the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests.

The OP provide the following Conditionality's:

To be eligible for WB financing, Industrial commercial forest harvesting operations must be certified under an independent forest certification system acceptable to WB (or following a time-bound plan to achieve certification);

To be acceptable, certification system standards must be developed with the meaningful participation of local people and communities; indigenous peoples; non-governmental organizations representing consumer, producer, and conservation interests; and other members of civil society, including the private sector

### **3.5.7 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, Indigenous Peoples, 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.

This subproject of WaSSIP triggers OP 4.01 and OP 4.12. This is because the project in question is a water project which greatly affects the indigenous population hence the need to get their views on the project itself and what environmental factors it may perceive to affect, hence the need for the policy OP 4.01.

Due to settlement on path on which both existing lines and new lines are to be placed has happened, there's need to identify those who will be affected due to displacement when the project begins and find a suitable way to compensate the relevant parties on disruption of livelihood hence the need for Op 4.



## **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 solid waste management in the region of the proposed project.

In addition to the physical, biological and social baseline conditions, the Consultant carried out household surveys based on the same so as to get particular data on the existing conditions in the project area.

### **4.1 Physiographic and Environmental Conditions**

#### **4.1.1 Location**

Mombasa County is one of the seven counties in Coast region. It is situated in the southeast of Coast region. It lies between latitudes 3°80' and 4°10' south of the equator and longitudes 39°60' and 39°80' east. The County borders Kilifi County to the North East, Kwale County to the South-West and Indian Ocean to the East.

The County covers an area of 294.6 km<sup>2</sup> including 65 km<sup>2</sup> of water mass. The Project Region is defined as Mombasa Water Supply coverage area and includes:

- Island: covers Mombasa Island;
- North Mainland: covers Kisauni;
- West Mainland: covers Changamwe;
- South Mainland: covers Likoni.

#### **4.1.2 Climate**

The Project Area receives localized conventional rainfall. The climatic condition variations in the area are attributed to SE Monsoon winds (blowing between April and September) and the NE Monsoons (October to March) and oceanic influence.

The rains occur during the inter-monsoonal period, with the long rains starting from March to June, while the short rains occur from October to November/December.

The mean annual rainfall for the Short rains is 240mm and 665mm for the long rains.

It is generally hot and humid all the year round. The mean daily temperature ranges between 22°C - 29.5°C. The lowest temperature is experienced during the long rainy seasons.

Average relative humidity along the coastal belt is 65% but decreases towards the hinterland.

#### **4.1.3 Topography and Geology**

The Project Area is situated in coastal lowland with extensive flat areas rising gently from 8 meters above sea level to 100 meters above sea level in the west. It can be divided into three main physiographic belts, namely:

- The flat coastal plain, which 6 km wide, and includes the Island Division, Kisauni on the North Mainland and Mtongwe to the south;

- The broken, severely dissected and eroded belt that consists of Jurassic shale overlain in places by residual sandy plateau found in Changamwe division;
- The undulating plateau of sandstone that is divided from the Jurassic belt by a scarp fault.

Nearer the sea, the land is composed of coral reef of Pleistocene Age that offers excellent drainage. The coral limestone and lagoon deposit reach a thickness of 100meters. Along the coastline are to be found beautiful beaches, which together with a variety of coastal resources and a rich biodiversity, has attracted tourists making Mombasa a favourite tourist destination.

#### **4.1.4 Soils and Land Tenure**

The predominant soil types in the project area are a mixture of clay and sand with excellent drainage. In some parts, the soils are slightly saline.

Soils on the coastal plain are a mixture of limestone with lagoonal deposits which are deep, dark red to reddish brown and sandy clay loam or sandy soil with a top-soli of loamy sand (rhodic ferrosols). These are found in Kisauni, Bamburi, Mwakirunge and Utange areas and parts of Likoni Division.

Soils developed on higher lagoonal deposs (Kilindini sands) are excessively drained to well drained and very deep, sandy to loamy sand. These are found in Changamwe division and some parts of Kisauni Division.

Those that are developed on lower lagoonal deposits are a complex of very deep soils of varying drainage, condition, colour, texture and salinity. These soils are found in Likoni Division in Mtongwe, Mbuta areas and parts of Kisauni Division.

Soils on mangrove swamps are very poorly drained, deep, moderately to strongly saline. Water logged loam to clay are found in Mwakirunge to Jomvu areas.

#### **4.1.5 Natural Water Sources**

The area has no permanent rivers, but due to the favourable geology of some parts of the County, the water table is high and the sinking of boreholes and wells has led to the increased supply of water to supplement the reticulated supply.

#### **4.1.6 Population, Water Demand and Sanitation**

A summary of the projected population up to the Year 2030 Horizon is given in Table 4-1 below:

**Table 4-1: Summary of Project Population up to Year 2030 Horizon**

Area	Population 2009	Project Population			
		Project Growth Rate	2010	2020	2030
Mombasa Island	143,128	3.4%	148,078	208,042	292,288
North Mainland	380,055	3.4%	393,199	552,424	776,127

South Mainland	139,972	3.4%	144,813	203,455	285,843
West Mainland	250,179	3.4%	258,831	363,644	510,901

Mombasa District Water Supply System comprises of:

- Island water supply system;
- North Mainland water supply system;
- South Mainland water supply system;
- West Mainland water supply system.

The Projected Water Demands for the Project Area are as shown in Table 4-2 below:

**Table 4-2: Summary of the Total Net Water Demand and Total Gross Water Demand for Horizon 2010, 2020 and 2030**

Year		2010		2020		2030	
Sub Area		Total Net Demand	Total Gross Demand	Total Net Demand	Total Gross Demand	Total Net Demand	Total Gross Demand
Mombasa North Mainland	Mean	44100	52900	62100	74500	87200	104600
	Peak	89200	107000	125400	150500	176	211200
Mombasa Island	Mean	21300	25600	30	36	42100	50500
	Peak	43000	51600	60300	72400	84700	101640
Mombasa West Mainland	Mean	38800	46600	54500	65400	76300	91600
	Peak	77900	93500	109500	131400	153200	183800
Mombasa South Mainland	Mean	19600	23500	27500	33	38600	46300
	Peak	39400	47300	55600	66700	78100	93700

Mombasa Island and West Mainland have a sewerage system. But North mainland and South mainland have no sewerage systems and therefore, like the unserved areas of Island and West Mainland, rely on onsite sanitation or bush. The population of Mombasa District connected to sewerage is less than 11%. The remainders use a variety of on-site sanitation methods which have resulted in high levels of ground water pollution. The treatment plants which serve the sewered areas discharge untreated waste water directly into the sea and creeks.

## **4.2 Socio Economic Infrastructure**

### **4.2.1 Administration**

The project area falls within Mombasa County. The Affected locations are:

- Shanzu
- Tudor
- Mikindani
- Changamwe
- Likoni
- Kongowea
- Mishomoroni

### **4.2.2 Transport**

Mombasa Island is surrounded by a number of creeks with steep cliffs. These creeks make communication between the mainland and parts of the island difficult. It has led to building of expensive bridges such as Nyali Bridge, Mtwapa Bridge and Makupa Causeway. The shortest form of communication between the Island and Likoni is through the ferry.

On the other hand, the deep creeks have enabled the Kilindini Harbour to be able to accommodate big ocean vessels due to its depth. Other forms of transport are the railway line leading out to Uganda and the Moi International Airport

### **4.2.3 Land Use and Economic Activities**

Mombasa District does not have much land under farming; the bigger portion of the land is trust land and is under housing or industrial activities. Some of the people are landless or squatters.

The climate is favourable for growing tropical fruits such as coconuts and mangoes as well as cashew nuts and cassava. However, most of the crops are being marginalized by house construction for residential and industrial purposes.

The only gazetted forest in the project area is the mangrove forests growing in the shallow swampy areas along the creek. These are found in Port Reitz Creek, Tudor Creek, and Mtwapa. Tree species of economic value are the *Rhizophora Mucronata* (Mkoko) which is used for construction and the *Ceriops togal* (Mkandaa) which is of medicinal value. Mangrove poles are cheaper and more durable than other types of timber. Those that are unsuitable for construction are used as wood fuel.

The Indian Ocean provides livelihood for the people in the Project Area through; fishing, transport and commercial and trade activities such as clearing and forwarding. The Mombasa port serves as an important inlet and outlet for landlocked countries such as Uganda, Congo and Rwanda.

Tourist attractions include historic sites such as Fort Jesus and Old Town Mombasa and ocean related tourist activities such as swimming, scuba diving, sailing and deep sea fishing. Mombasa Marine National Park and Mombasa Marine Natural Reserve also provide touristic attraction such as coral reefs and sea grass beds. They also support touristic boating activities. The Exclusive Economic Zone supports fishing for local consumption and inland hotels like Nairobi and other major towns.

Mombasa is a major Industrial and Port City. Industries are mostly located in Changamwe, Kisauni and the Island. Minerals include coral limestone and sand. Exploitation of sand should however be controlled to prevent destruction of beaches. The port based in Kilindini Harbour is the biggest sea port in East Africa and sources Uganda, Rwanda, Burundi and DRC.

The profile of the urban population of Mombasa County is related to the types of lodging units and land texture categories which directly relate to the water consumption categories and have been used to calculate the water demand in specific areas within the distribution network.

#### **i) Urban Population**

Generally, a double demographic movement is in progress worldwide from the Inland Settlements to the Coasts and from Rural Areas to Towns.

In Kenya, as a whole, the urban population was estimated at 9.9% (1.1 million persons) in 1969, 15.1% (2.3 million persons) in 1979, 17.5% (3.75 million persons) in 1989 and 27.5% (10.6 million persons) in 2009. Due to the relative magnitude of the population in Mombasa, urban population was already much higher than the Kenyan average during this period.

In the Study Area, the current population within the scope of this project approaches 1 (one) million persons, including all locations in the North Mainland, West Mainland, Island and South Mainland.

#### **ii) Lodging Units, Urban Textures and Densities in Mombasa**

The lodging units in Mombasa may be divided into:

- Classical flats with one or two stories in European cement or brick type buildings;
- Villas of 200-400 sq. metres, with one or two floors: They are the mark of upper class areas, typical in the south of Mombasa Island, or along the seaside;
- Swahili houses which are the mixed Arab/African traditional living structures on the Coast, and are composed of a two rows of five or six rooms separated by a central corridor.
- Traditional houses, square mud houses of four/six rooms, similar to those found in existing rural settlements.

It should be noticed that the way these lodging units are mixed produces several different types of urban textures, among them:

- The old town made of very close low buildings, including flats, shops, offices and some various facilities here and there.
- The central area, where a strip of buildings, generally located along the main roads borders and partly hides very dense Swahili settlements inside the blocks.
- The Government (or other institutions) estates, made of a series of two story buildings or very dense allotments of small houses.
- Medium/ high density zones, which either are composed of Swahili/ rural type settlements in the first belt of Mombasa outskirts, or correspond to (more) scattered lodging units in Mombasa Island

- Semi- rural areas, made of irregular Swahili and traditional house settlements in the second belt of Mombasa outskirts.
- And not so different from the two preceding types, what could be called the (every shape, every material) slum areas, as, for example, North West of the port entrance in Changamwe.

In addition, the usual lodging units have to include hotels and the numerous tourist cottages complexes all along the coastline.

As described above, these different urban textures are the result of specific mixing of various types of lodging units, and generate different ways of occupying land and houses, compared to the size of households: in a word, densities.

### **iii) Land Ownership and Planning Policy**

All activities, be they social or economic, urban or rural, must be located on land, and therefore depend on the regulations and practices that govern land ownership. Land allocation and ownership require proper planning for optimal utilisation.

- It is important to note that when development occurs in the absence of a proper planning tradition, it may result in the following:
- Except when projects are linked to large, basic infrastructure – water supply may be an example, development only depends on the issue of land titles. And indeed, this may not occur at the proper time or correspond to any general or specific scheme.
- In the case of freehold lands, with investments being provided by private parties, there is no protection due to insufficient control by the local government or to the lack of any proper legislation to apply.
- As a result of the huge demographic pressure and based on the same juridical ground, another effect would be the spreading of squatters wherever they may settle.

#### **4.2.4 Power Supply**

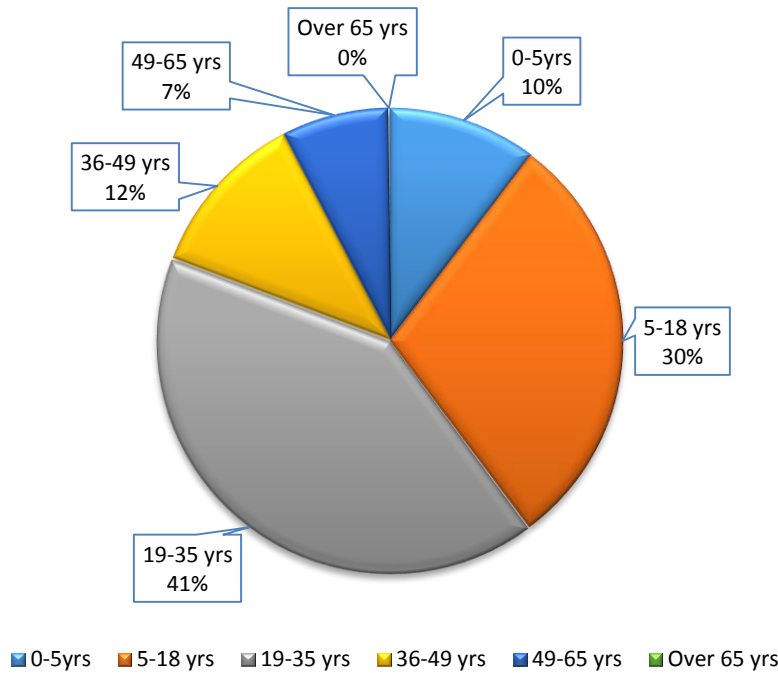
The Project Area is served by the national grid under the Kenya Power and Lighting Company (KPLC).

### **4.3 Environmental and Social 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 was interviewed for purposes of the analysis.

#### **4.3.1 Population dynamics and household characteristics**

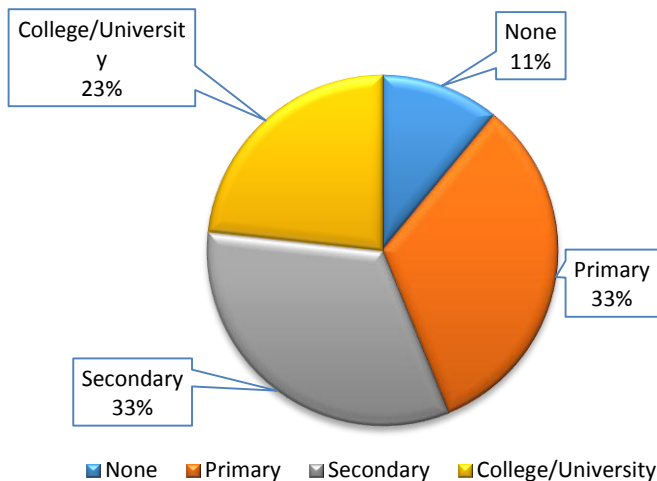
The average household size is 5 people. The general trend shows that most of the people fall in the 19-35 and 5-18 age groups. Figure 4.1 shows the population age brackets.



**Figure 4-1: Age of Population**

Source: Survey data.

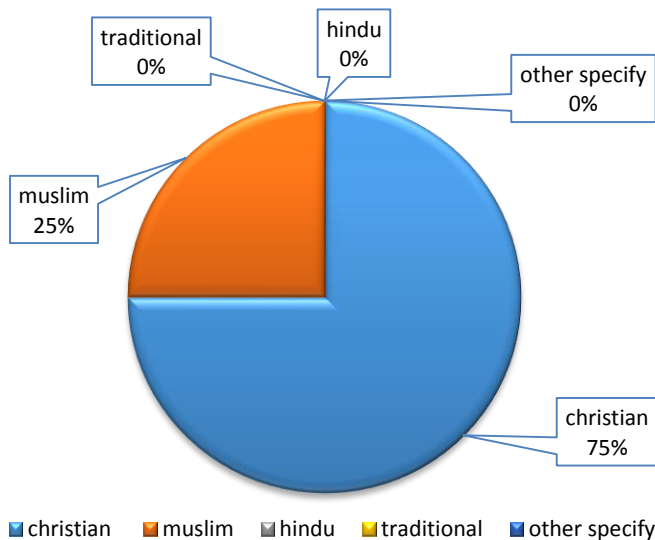
Literacy levels were as follows:- Primary level 33%, Secondary level 33%, college /university 24% and no education at all 11%. Therefore 89% of the population are able to read and write.



**Figure 4-2: Household Literacy**

Source: Survey data.

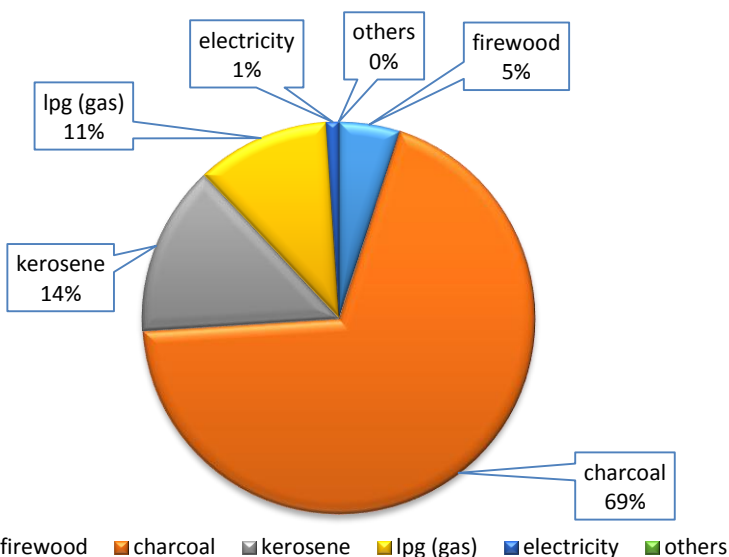
The dominant religion is Christianity with 75% of the population professing the faith.



**Figure 4-3: Religion of Population**

*Source: Survey data.*

Charcoal is the main source of energy for the community. 14% of the population use kerosene stoves while 17% of the rest either use gas, electricity and firewood. Electricity however is the type of fuel least used for cooking.



**Figure 4-4: Source of Energy**

*Source: Survey data.*



### 4.3.2 Socio-economic activities and land use patterns

The main socio-economic activities businesses and formal employment. 36% of the household income is salary income, 62% is from business while 2% is from livestock farm farming.

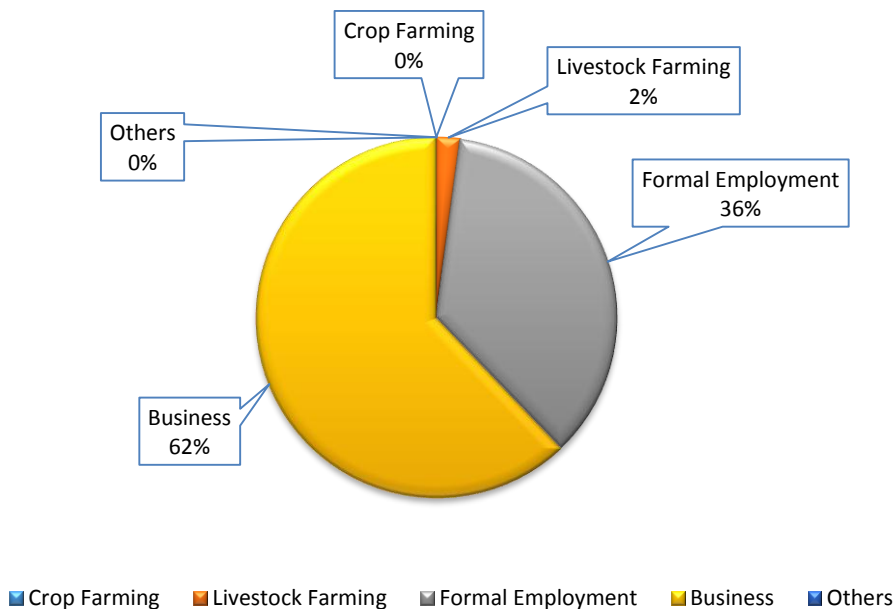


Figure 4-5: Household Socio-economic Activities

Source: Survey data.

Most of the populations' income for those who are formally employed lies between 10000-20000. However ¼ of the population in that area still leave under 10000 per month.

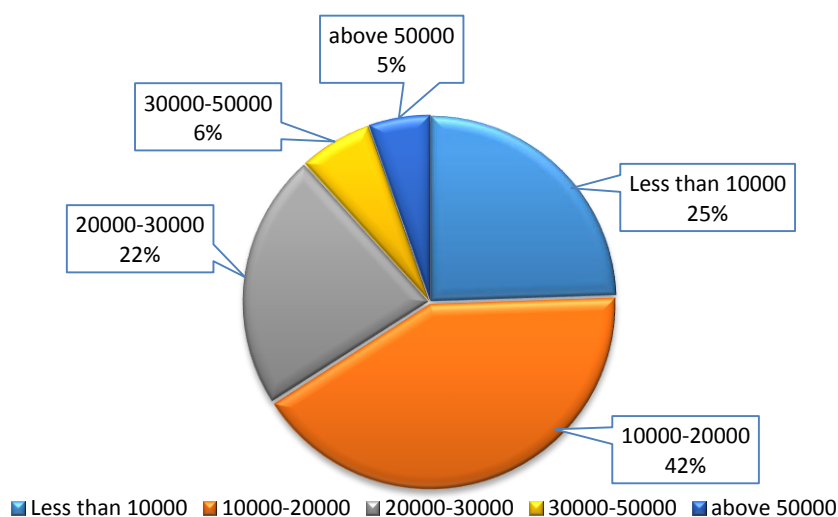
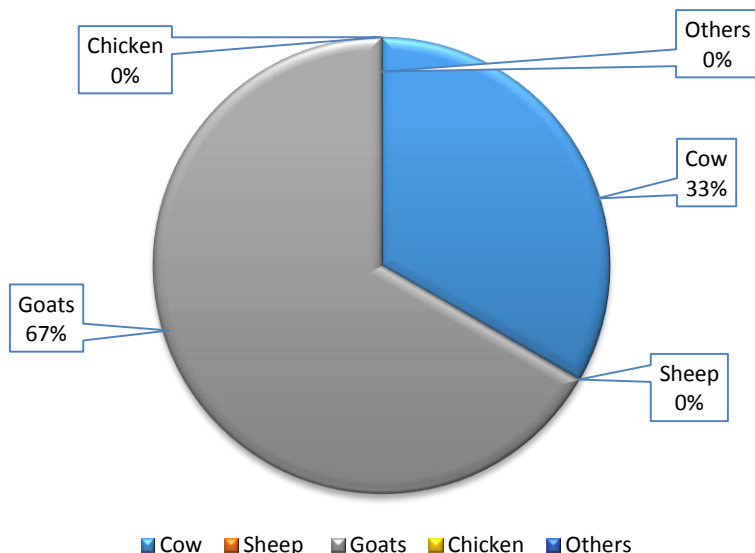


Figure 4-6: Main Sources of Income

Source: Survey data.

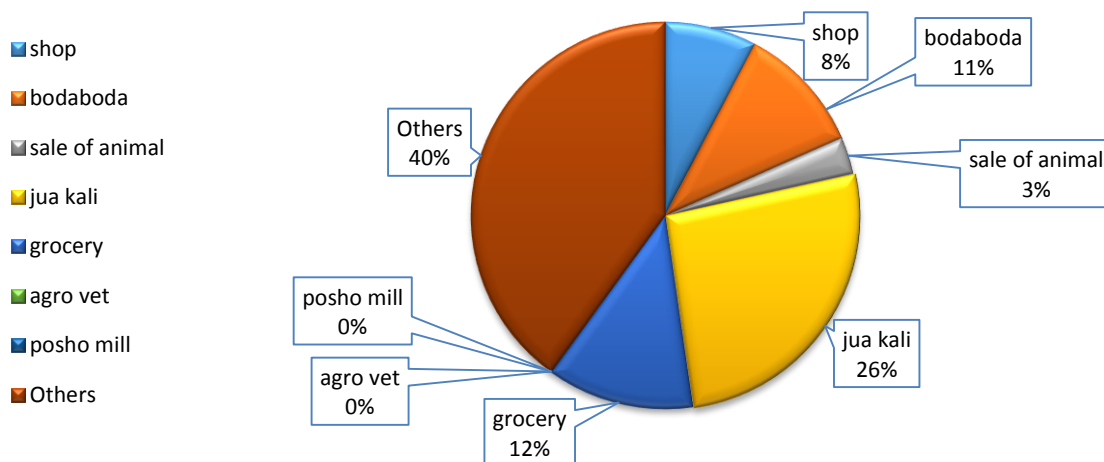
2% of the households own livestock. The main livestock reared are goats and cattle. 67% of the households own goats, 33% owns cows.



**Figure 4-7: Main Livestock Owned**

Source: Survey data.

The household conducting business constitutes 62% of the total population. Most business carried out in this area is home grown businesses, and constitutes to 40% of the business community, such as, mpesa tills, sale of animal products, sale of scrap metal, sale of charcoal, sale of cloths, barber shops etc. 26% in the juakali sector, 12% sell groceries, 11% have bodabodas, 8% have shops and 3% rear and sell their livestock as a means of earning a living

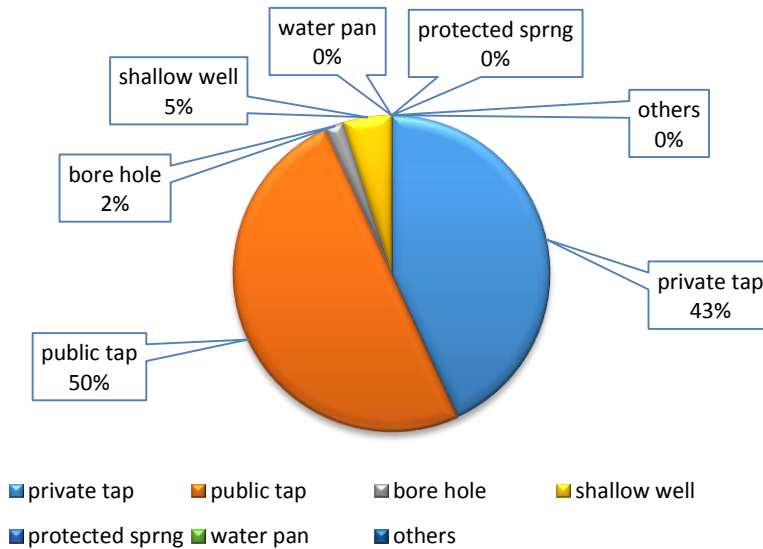


**Figure 4-8: Type of Business Carried Out**

Source: Survey data.

### 4.3.3 Water supply

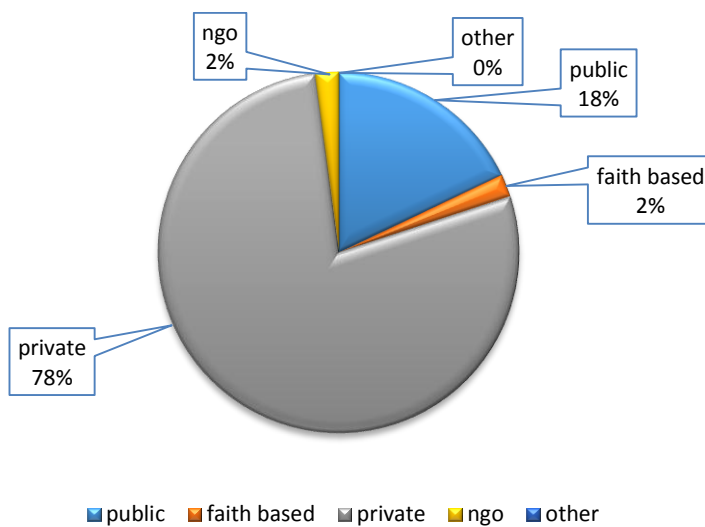
Public water provided by Coast Water Service Board is the main source of water in the area constituting 50%. The water is mainly drawn from public taps.



**Figure 4-9: Main Sources of Water for the Community**

Source: Survey data.

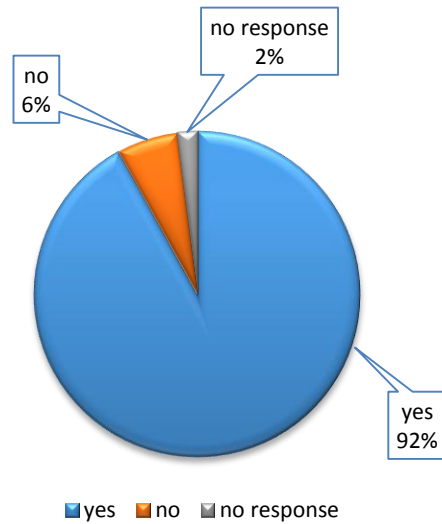
Most of the water providing companies are either privately owned or publicly owned, with 78% owned by the private sector and 18% owned by the public. Ngo’s and faith based institutions only own 2% each.



**Figure 4-10: Ownership Status of Water Resources**

Source: Survey data.

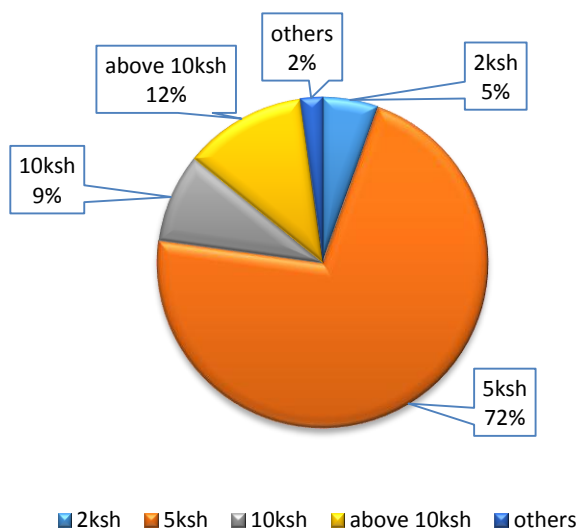
The cost of water varies from Ksh.2 to ksh10 depending on the ownership status 92% of the population pay for water.



**Figure 4-11: Percentage Population Paying For Water**

Source: Survey data.

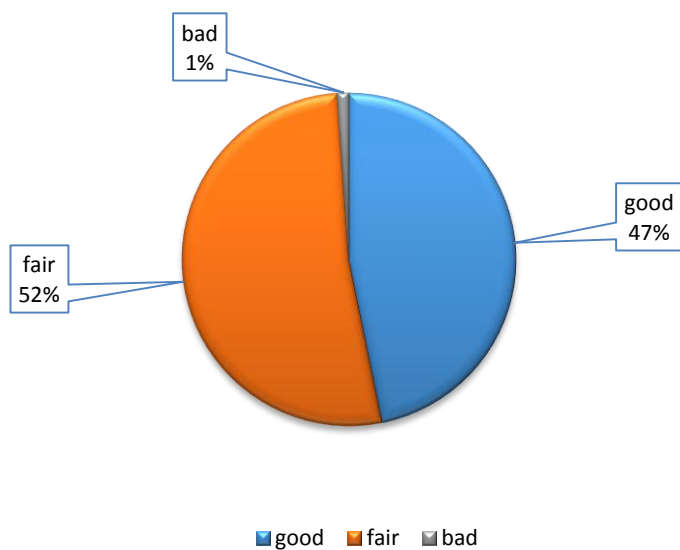
The cost of water varies depending on the ownership of the water. Others in this case includes any amount above 10 shillings. Most of the population in the project area pay ksh5 for a 20l jerrican.



**Figure 4-12: Cost of 20 Litre Gallon of Water**

Source: Survey data.

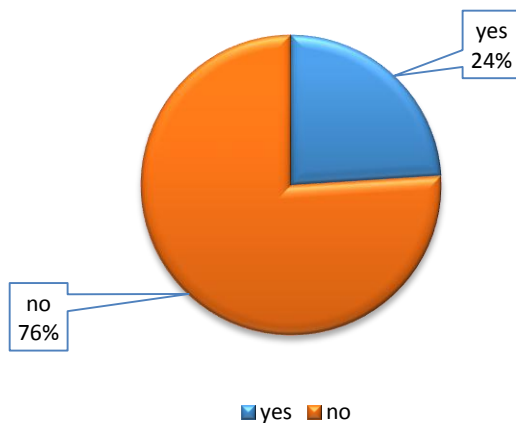
The water quality is generally good. 52 % of the residences view the water quality as fair, 47% as good and 1% as bad.



**Figure 4-13: General Status of Water Quality**

*Source: Survey data.*

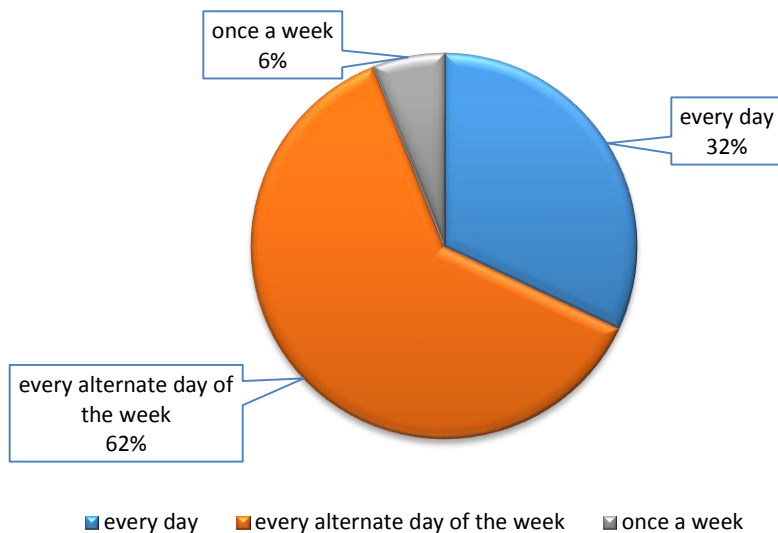
In most cases the existing water supply is not enough to meet the needs of all the people. 76% of the population felt that the water being currently provided wasn't adequate whereas the remaining 24% were being adequately supplied.



**Figure 4-14: Adequacy of Water Supply**

*Source: Survey data.*

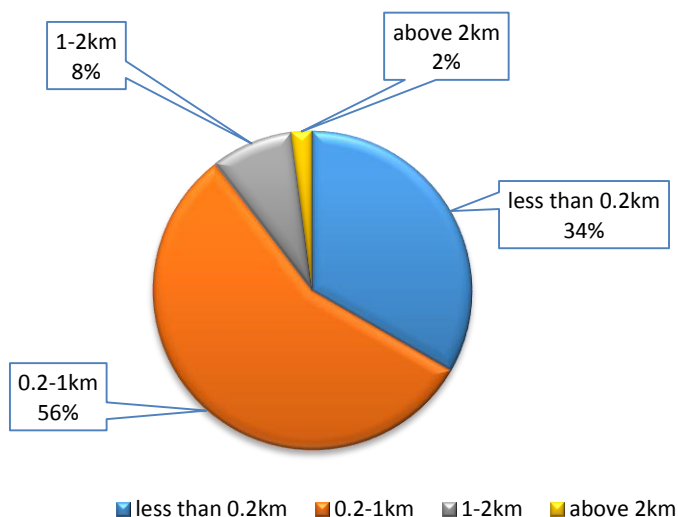
62% of the population fetch water every alternate day of the week, 32% fetch every day and 6% once a week.



**Figure 4-15: Frequency of Fetching Water**

*Source: Survey data.*

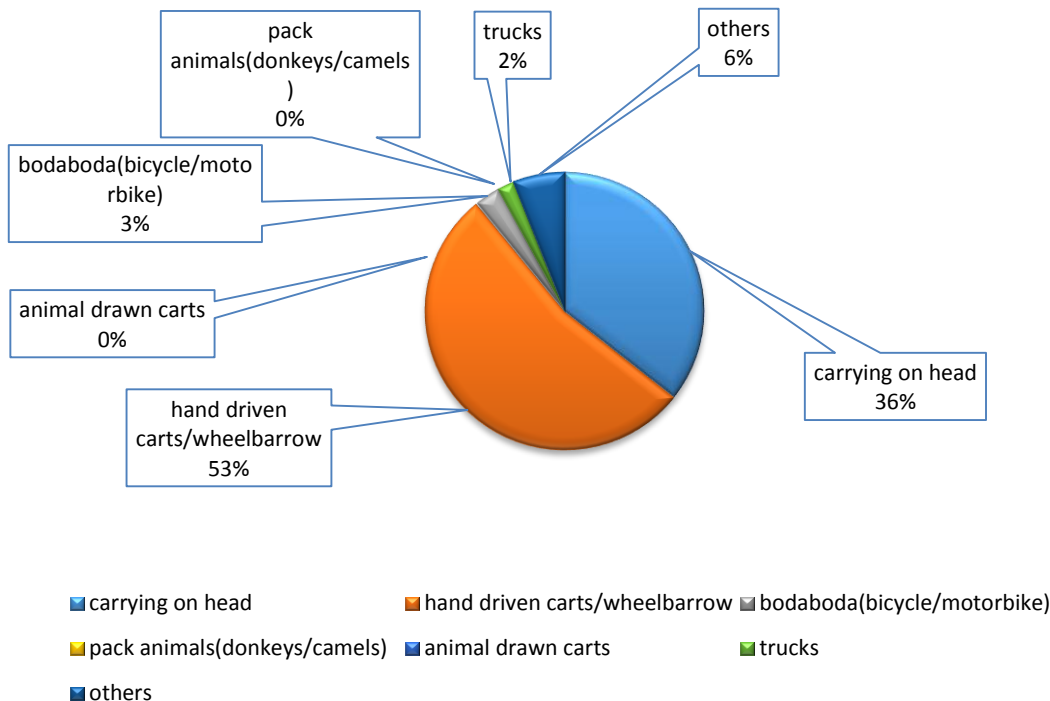
34% of the population walks for less than 0.2 km to the water fetching points; 56% walks for 0.2-1 km, 8% walks for 1-2km while 2% walk for more than 2 km to the water source.



**Figure 4-16: Distance to Water Source**

*Source: Survey data.*

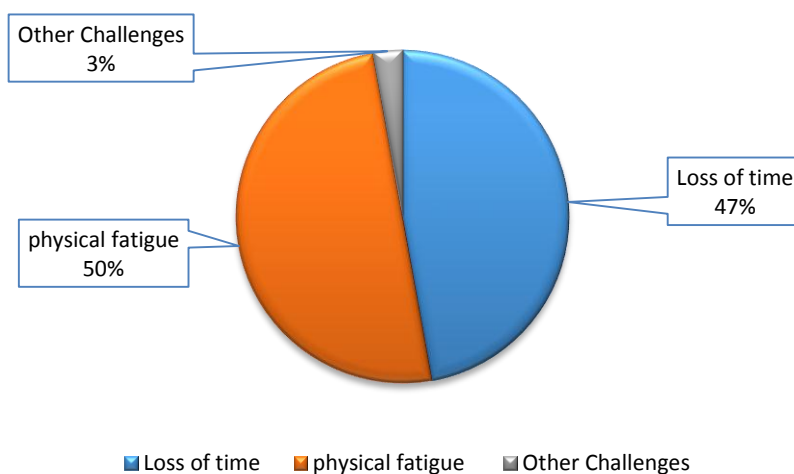
The common mode of transporting water is by carrying on hand driven carts/wheelbarrow 53%, carrying on the head 36%, use of pack animals (donkeys,) 0%, use of bodaboda (bicycle, motorbike) 3%, use of animal drawn carts 0% and use of trucks 2%, other modes (through vendors, direct supply i.e. piping, door to door supply)6%.



**Figure 4-17: Common Modes of Transporting Water**

Source: Survey data.

The common challenges faced in transporting water include loss of time 47%, physical fatigue due to long distances travelled to get to the water sources 50%, while others 3% (feel that high cost, inefficient means of transport)



**Figure 4-18: Challenges Faced in Transporting Water**

Source: Survey data.

#### 4.3.4 Environmental situation

The environmental concerns in the area include water shortage, invasive species, extinction of endangered species, mosquitos and malaria spread, overgrazing, deforestation, drought, solid wastes, and others (poor drainage, smoke from manufacturing companies, waste being dumped on the roadside, poor sewerage system)

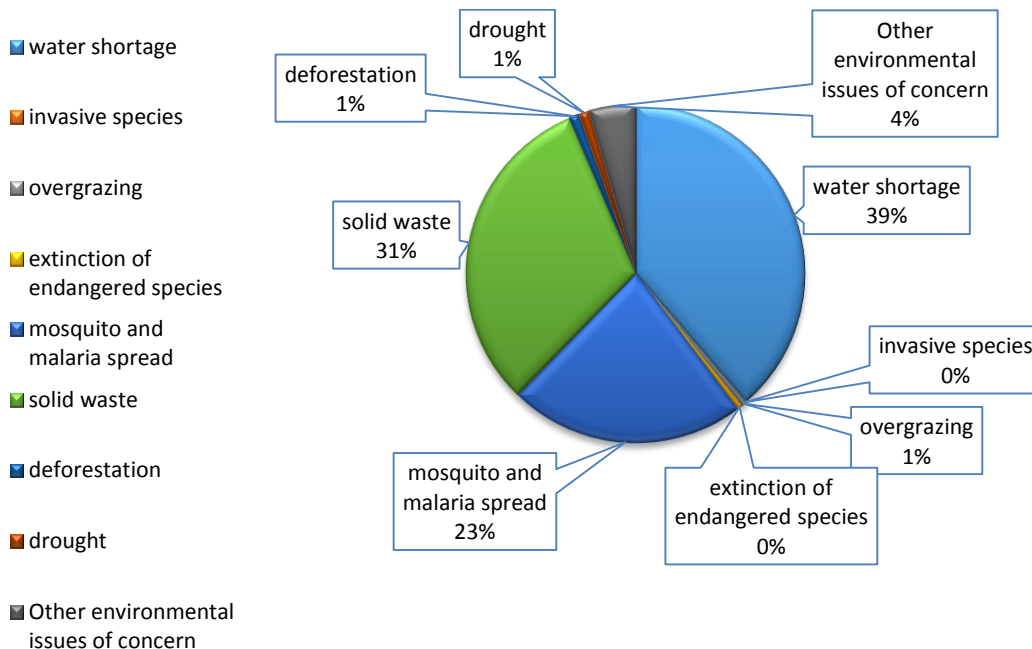


Figure 4-19: Environmental Issues of Concern

Source: Survey data.

There are a number of environmental conservation initiatives in the area such as tree planting, educating the public on environmental conservation and clearing of mosquito breeding sites, collection of solid wastes, others (burning waste, sweeping compounds and clearing bushes).

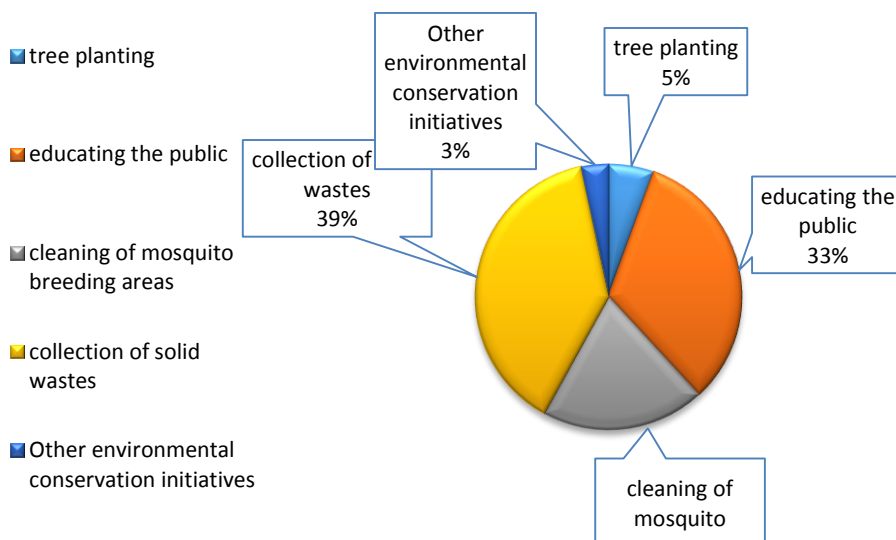
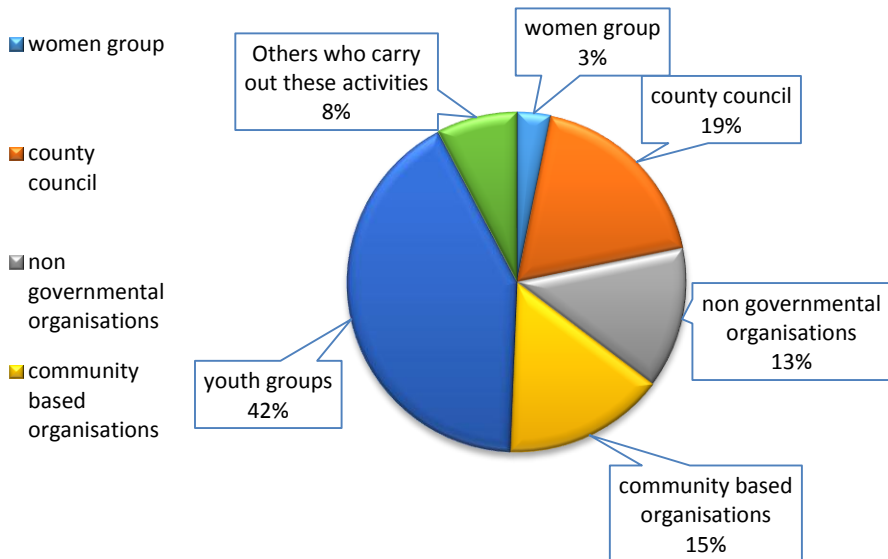


Figure 4-20: Environmental Conservative Initiatives

Source: Survey data.



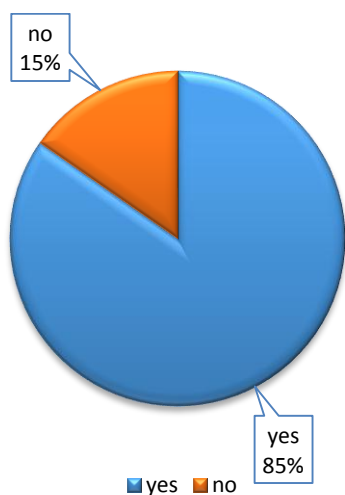
These activities are carried out by youth groups, women groups, NGOs, CBOs, individuals and work for food program and others (young boys at home, volunteers)



**Figure 4-21: Implementers of the Environmental Conservation Initiatives**

Source: Survey data.

85% of the population feel that the project will help conserve the environment while 15% feel that it will not.



**Figure 4-22: Effectiveness of the Environmental Conservation Initiatives**

Source: Survey data.

### 4.3.5 Health status

The prevalence diseases in the area are malaria, diarrhoea, eye infection, skin rashes cholera and respiratory infection.

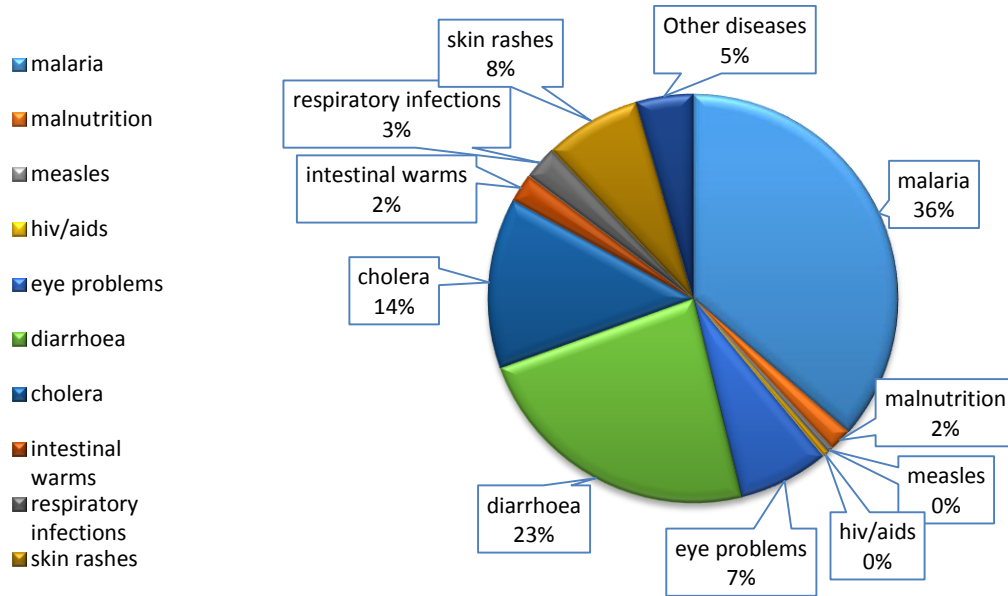


Figure 4-23: Prevalence Diseases in the Area

Source: Survey data.

Most of the respondents when sick seek medical attention or buy drugs from the kiosk/chemist.

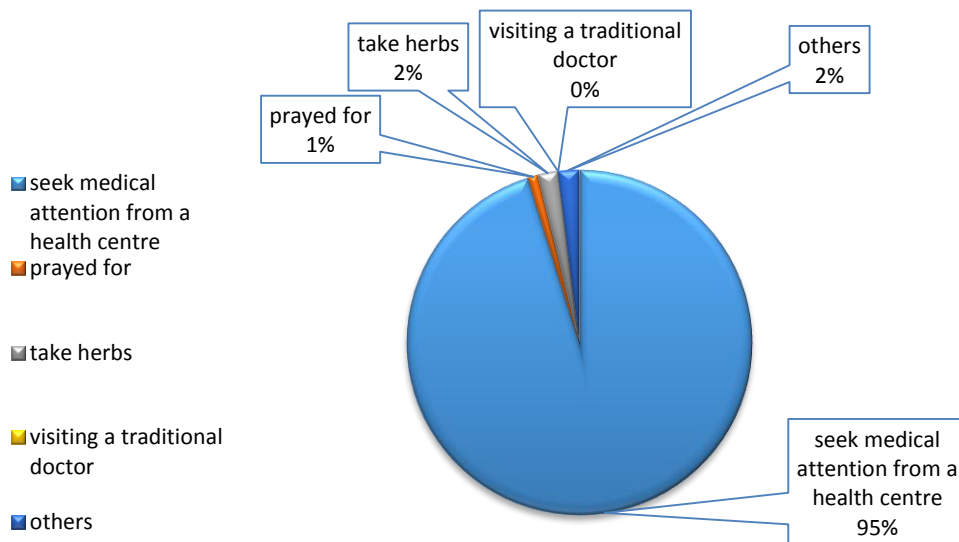
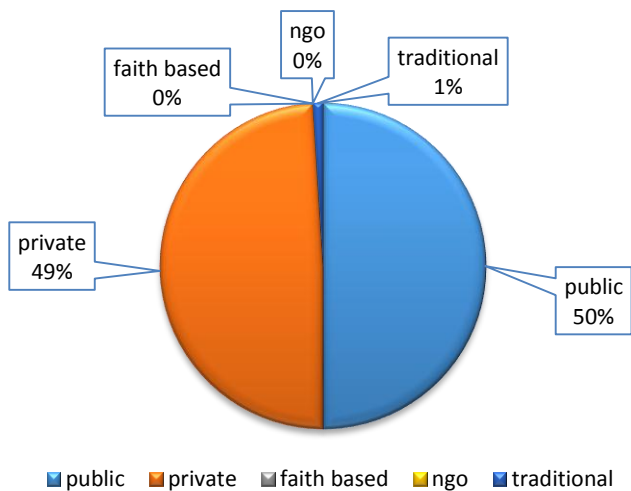


Figure 4-24: Type of Treatment

Source: Survey data.

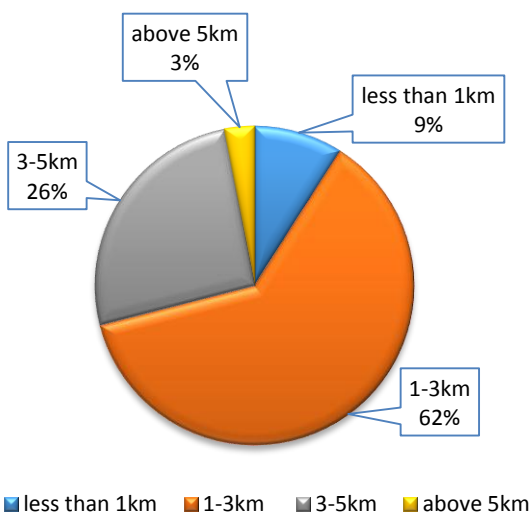
The health facilities where the people in the area seek help are mainly government health centres.



**Figure 4-25: Ownership Status of Health Facilities**

Source: Survey data.

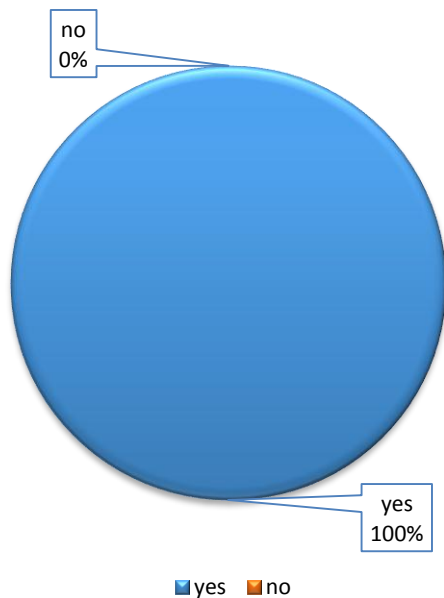
62% of the respondents walk for 1-3km to the health facilities, 26% walk for 3-5 km, 3% for more than 5 km, while 9% walk for less than 1km.



**Figure 4-26: Distance to Health Facilities**

Source: Survey data.

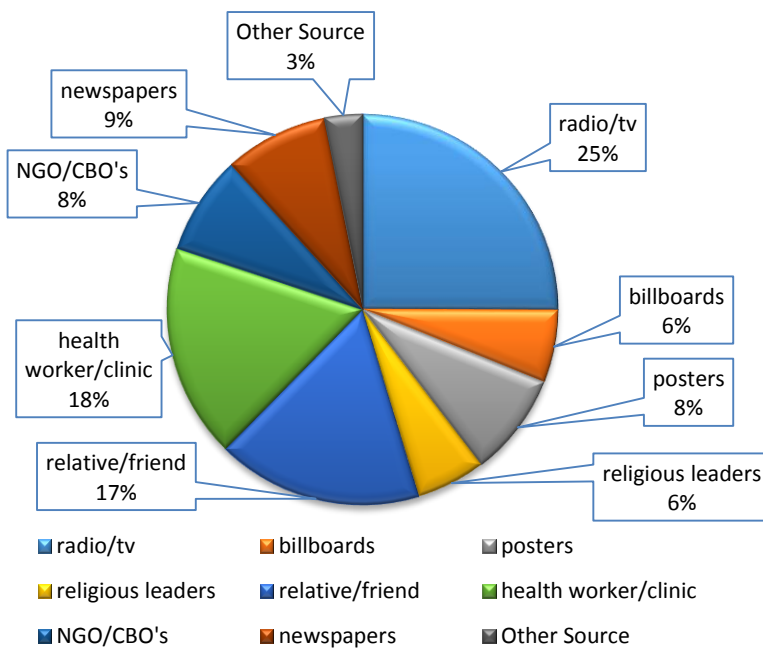
The level of HIV/AIDS awareness is high. 100% of the population are aware of HIV/AIDS.



**Figure 4-27: Level of Awareness on HIV/AIDS**

Source: Survey data.

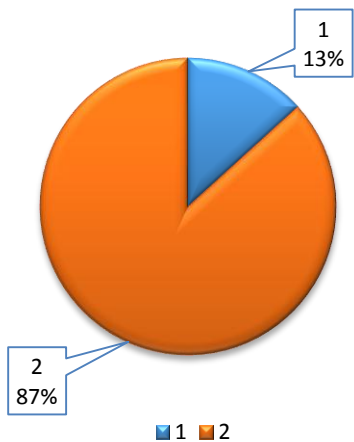
Information about HIV/AIDS is mainly got from the media, family members and friends, health workers and religious leader.



**Figure 4-28: Source of Information on HIV/AIDS**

Source: Survey data.

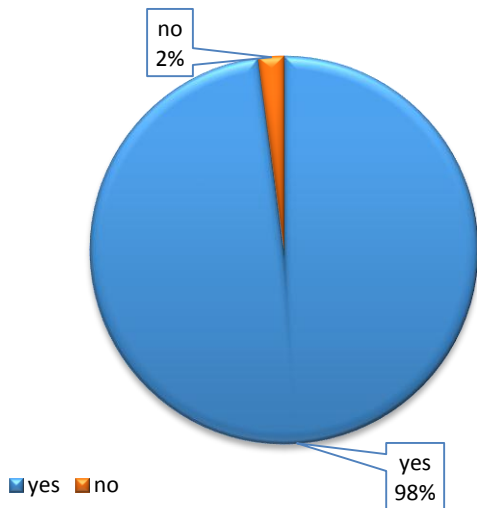
13% of the respondents have been affected by the disease whereas 87% hadnt been affected by Aids.



**Figure 4-29: Household Members Affected by HIV/AIDS**

*Source: Survey data.*

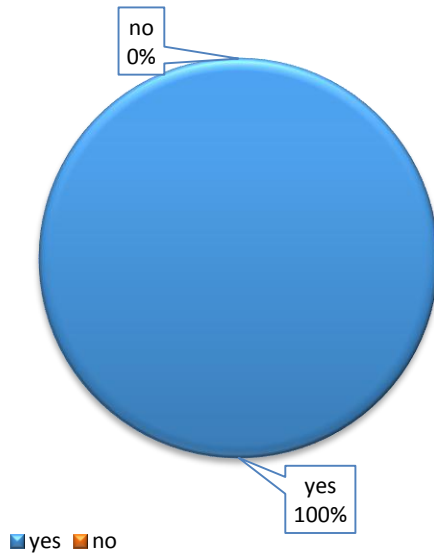
98% of the respondents feel that HIV/AIDS can be prevented while 2% says it cannot be prevented.



**Figure 4-30: Knowledge on Whether HIV/AIDS Can Be Prevented**

*Source: Survey data.*

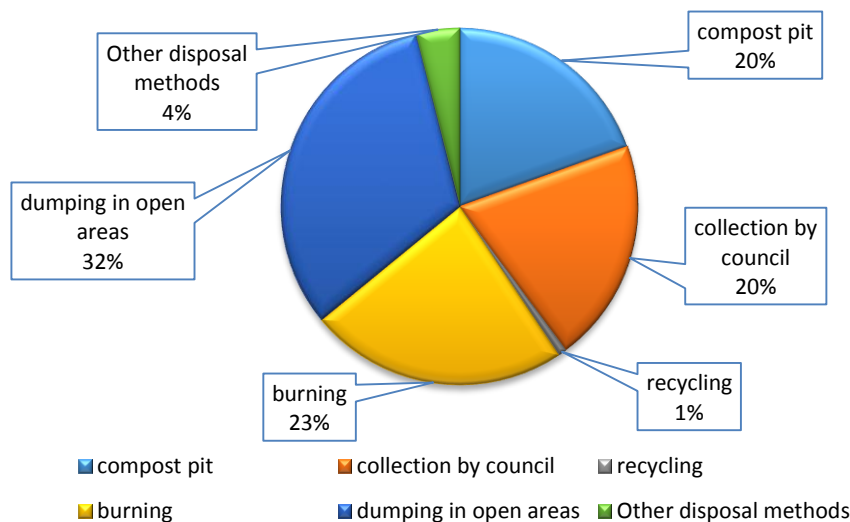
99% of the respondents know where to go for voluntary counselling and testing for HIV/AIDS.



**Figure 4-31: Respondents Who Know Where to go For Voluntary HIV/AIDS Testing**  
*Source: Survey data.*

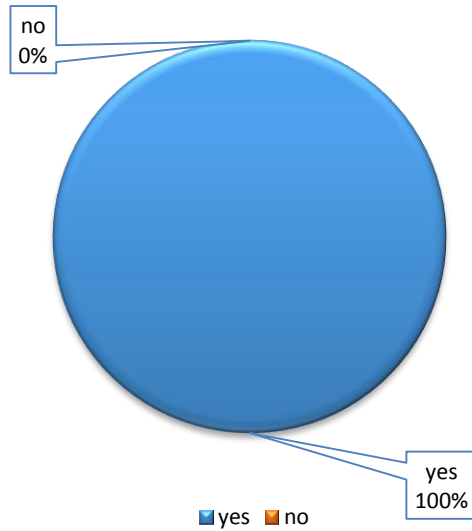
#### 4.3.6 Waste management

The methods used by the population to dispose refuse are by burning, bury/use compost pit, recycling, dumping in open areas, and collection by the county council.



**Figure 4-32: Common Waste Disposal Methods**  
*Source: Survey data.*

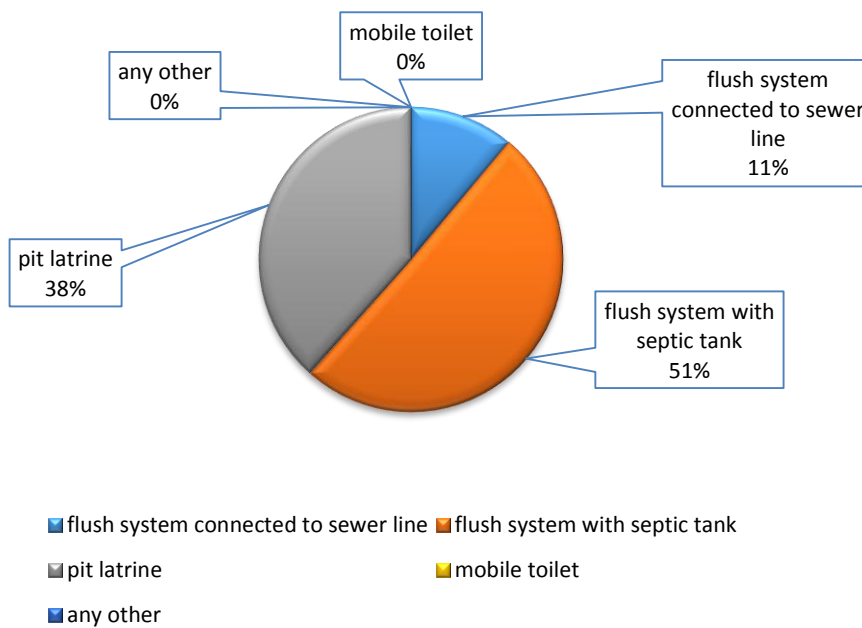
All households in the project area are have toilets.



**Figure 4-33: Respondents Who Have Toilets in Their Compound**

Source: Survey data.

51% of the population in the project area use flush system with septic tanks, 38% use pit latrines, 11% use the flush system connected to the sewer line.

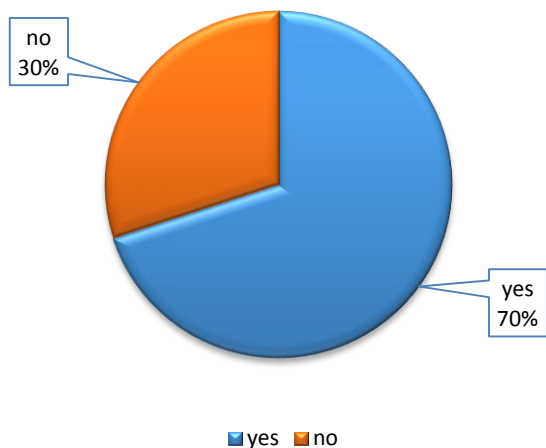


**Figure 4-34: Types of Toilets Respondents Have in Their Compound**

Source: Survey data.

#### 4.3.7 The Coast Water Service board pipeline water supply

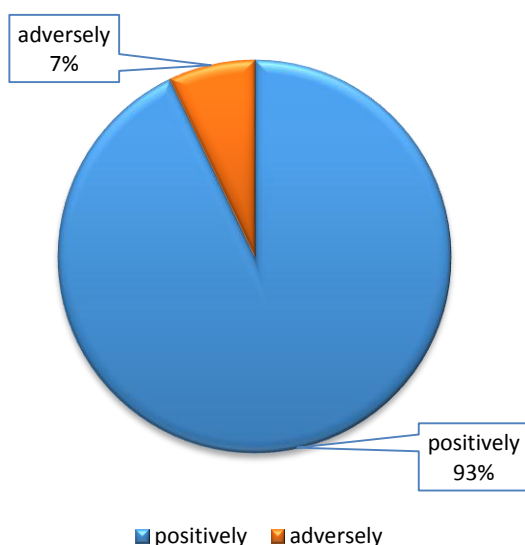
Most of the residents are aware of the intended construction of the pipeline



**Figure 4-35: Public Awareness of the Intended Construction of the Pipeline**

Source: Survey data.

93% of the respondents perceived that the construction of the pipeline will bring positive impacts while 7% percent perceived that it will bring about adverse impacts.

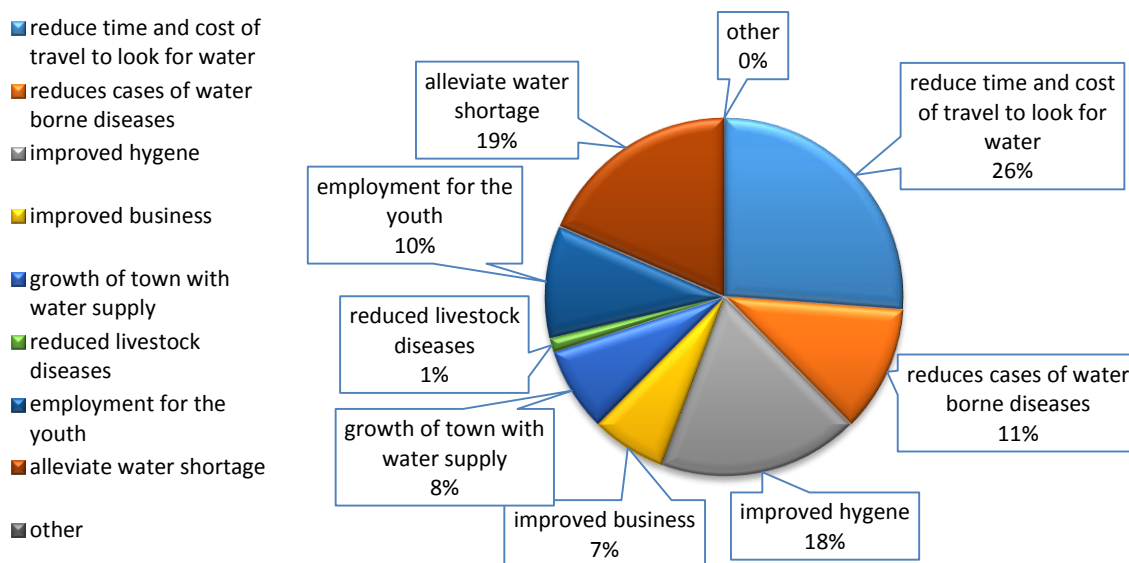


**Figure 4-36: Perceived Impact of the Water Supply Project**

Source: Survey data.

The positive impacts expected include reduced time and cost of travel to look for water, alleviate water shortages, improved hygiene, reduced cases of waterborne diseases, improved businesses, growth of town with the water supply, reduced livestock deaths and diseases, and employment for the youth.

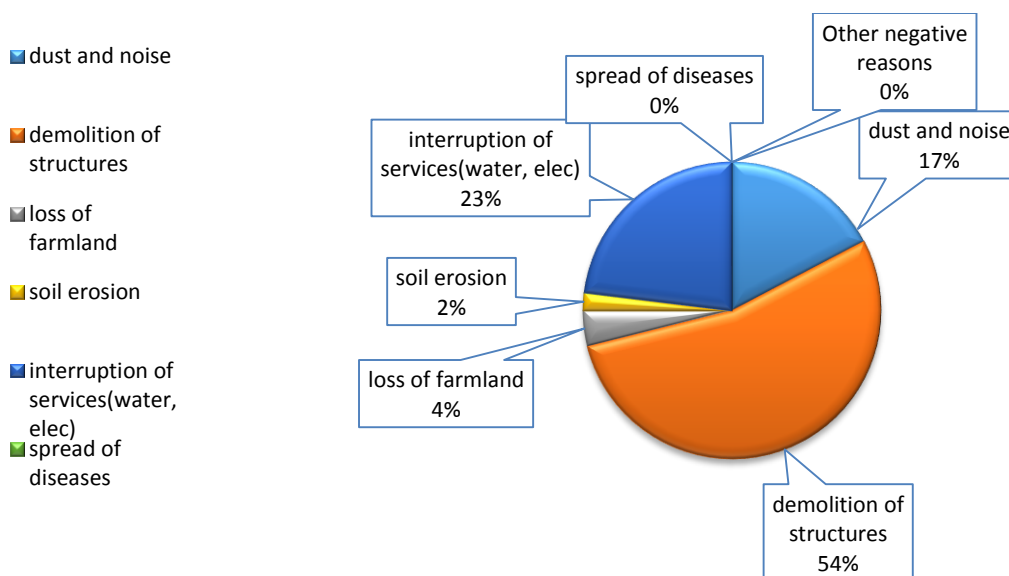




**Figure 4-37: Positive Impact of the Proposed Project**

Source: Survey data.

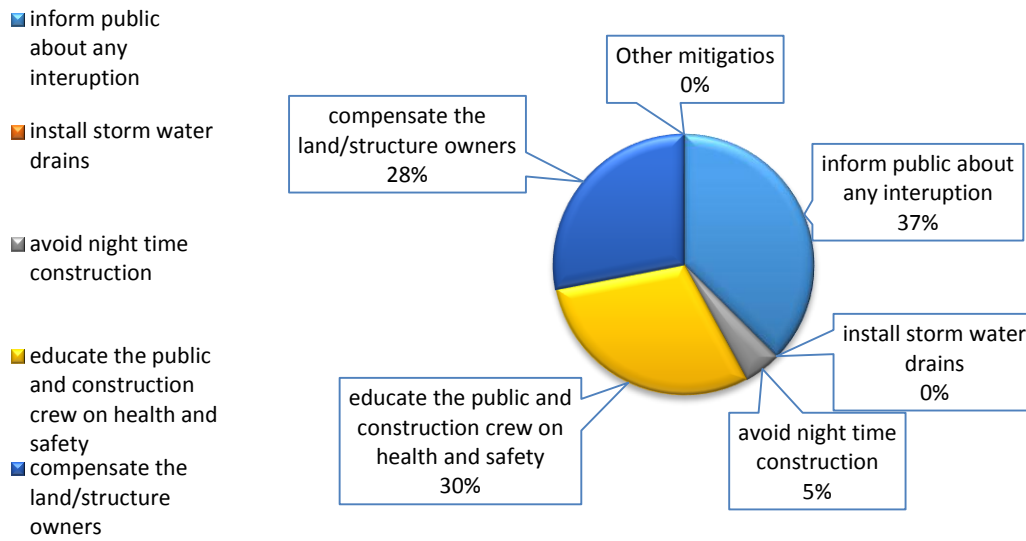
The negative impacts expected include loss of land/trees/crops, demolition of structures, interruption of services(electricity, water, transport), reduced water for downstream users, soil erosion, dust and noise and spread of diseases (STD, HIV/AIDS).



**Figure 4-38: 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, avoid night time construction and install storm water drains.

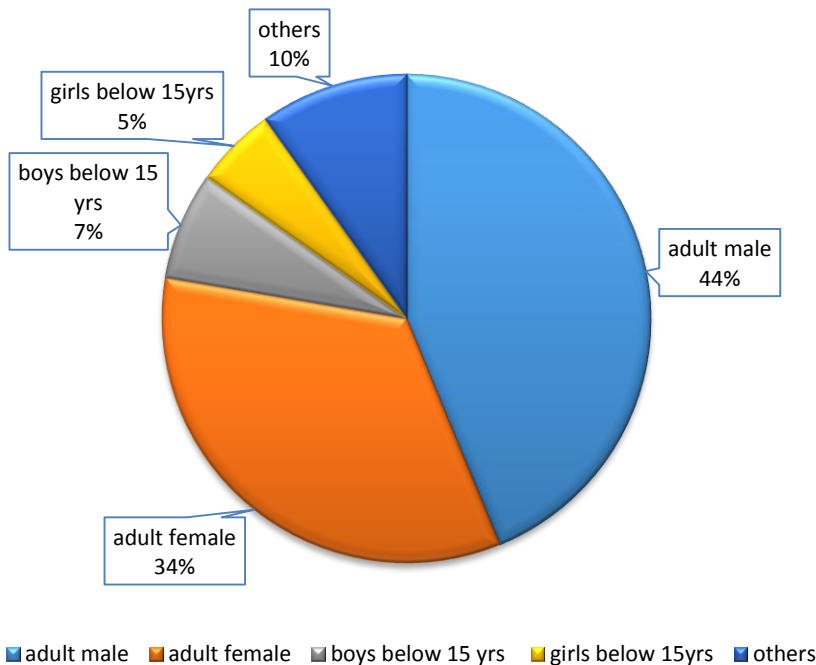


**Figure 4-39: How to Mitigate Adverse Impact of the Project**

Source: Survey data.

### 4.3.8 Social impact of the project

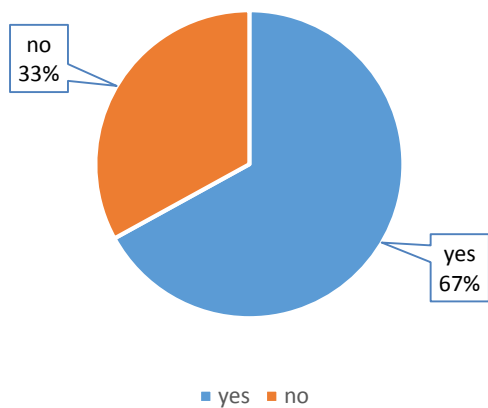
The majority of the people who usually fetch water are the adult male, 44% followed by the adult female 34%.



**Figure 4-40: Responsibility of Fetching Water in the Compound**

Source: Survey data.

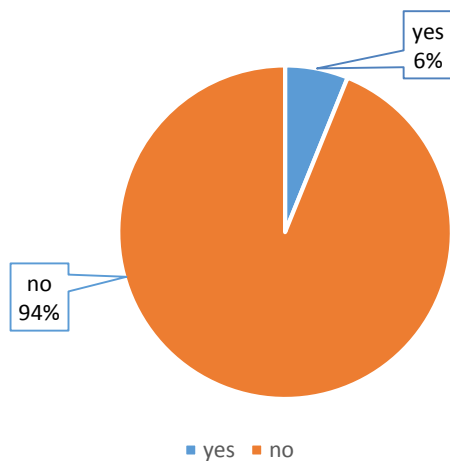
67% of the population identified burial sites in the proposed project area



**Figure 4-41: Presence of Burial Sites in the Area**

*Source: Survey data.*

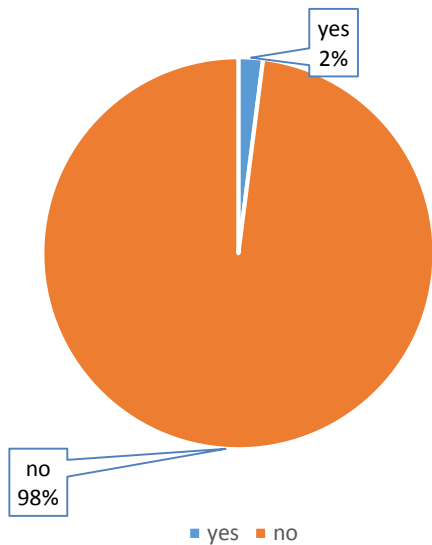
6% of the population identified shrines in their area, such as kaya forest.



**Figure 4-42: Presence of Shrines in the Area**

*Source: Survey data.*

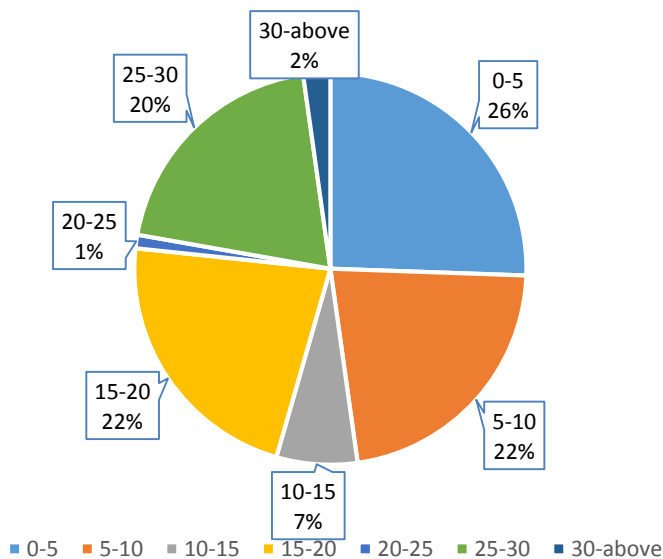
There were very few cultural heritage sites identified by the people living in the project area such as the Bangladesh pesa.



**Figure 4-43: Presence of Cultural Heritage Sites in the Area**

Source: Survey data.

Most people in the area, 26%, took between 0-5 minutes to fetch water.



**Figure 4-44: Time Taken To Fetch Water**

Source: Survey data.

## **5 CONSULTATIONS – PERSONS, AGENCIES & PUBLIC**

### **5.1 Legal Requirements**

#### **5.1.1 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.

#### **5.1.2 EIA and Audit Regulations**

Section 17 of the Environmental (Impact Assessment and Audit) Regulations 2003 states that an EIA Study should “seek the views of persons who may be affected by the project.”

### **5.2 Persons or Agencies Consulted**

The key issues associated with replacement and extension of a water pipeline will often relate to land-take, biodiversity, heritage, 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 of cultural property and heritage
- Protection and conservation of biodiversity, including endangered species and sensitive ecosystems in modified, natural and critical habitats, and identification of legally protected areas
- 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 the four core labour standards), and occupational health and safety
- Socio-economic impacts & fire prevention and life safety
- Land acquisition and involuntary resettlement
- Impacts on affected communities, and disadvantaged or vulnerable groups
- Impacts on indigenous peoples, and their unique cultural systems and values
- 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 persons were consulted in Mombasa town as indicated by the following consultation registers in tables 5-1 and 5-2 respectively.

**Table 5-1: Persons Met During the ESIA Study in Planning the Proposed Water Supply Project**

No.	Name	Office	Designation	Contacts
1	Haji Masa	Coast Waters Service Board Mombasa	Environmental Manager Coast Water Board	+254722379703
2	Mr Herbert Were	Mombasa Sub-County Lands Office	Land Valuer	+25420031669
3	Mr Safari James	Mombasa Sub-County Lands Office	Lands registrar of titles	+254720031669
4	Linet Jeptum	Mombasa Sub-County forestry Office	Sub-County forester	+254710449367
5	Bwana Heri Salim	Mombasa Sub-County Education Office	SCA, safer cities authority (quality regulation)	+254722754324
6	Eunice C. Mwaloa	Mombasa Sub-County Education Office	District Education Officer Mombasa Island	n/a
7	Mr Okwatsa	Mombasa Sub-County Education Office	Principal Education Officer	+254721595374
8	Mr Stephen Wambua	NEMA	County Director of Environment	0711-703135

### **5.2.1 Overview from the Environmental Manager (CWSB) on 13/01/2015**

The Environmental Manager of CWSB welcomed the team and proceeded to give the team an overview of the project as well as provide a key informant interview on the environmental and social issues affecting the community, what is and can be done to mitigate the issues.

**i) Current Sources of Water**

The project area is currently being supplied by Coast Water Service Board which gets its water from Mzima, Marere, Baricho and Tiwi bulk water systems. Water distribution, however is not adequate hence some reaches of the project area are not adequately supplied thus resulting to the use of shallow wells for water. Water from the wells however is usually saline and not good for human consumption.

**ii) Environmental and Social Issues in the Project Area**

The main environmental issues experienced in the area include:

- Lack of proper sanitation facilities: Better Part of Mombasa and its environs in particular are not served by a sewerage system. Thus people resort to disposing untreated waste into the marine. Poor sanitation affects the natural water system and leads to diseases, such as typhoid and cholera and also leads to the marine degradation.
- Solid Waste and Liquid Waste Disposal: Again Mombasa and its environs do not have a proper solid waste collection mechanism, thus the project area experiences solid waste generation, particularly in the trading centres.
- Trenching: there is no backfilling in most of the trenches dug in the area
- Quarrying: there is a lot of quarrying the area resulting to deep pits which aren't rehabilitated after use.
- Oil spills along the mangroves which bring about environmental degradation.

**iii) What is being done to mitigate the Environmental Impacts**

The environmental Manager of CWSB stated that there were initiatives which were being carried out by bodies such as the Environmental Trust of Kenya which were concerned with planting trees and other vegetation, and also garbage collection in Mombasa town and its environs. Youth groups within the town also carry garbage collection exercises. This groups however were are not as active currently as before.

The Environmental Manager of CWSB concluded by stating that the water was adequate for expansion of the line, however the distribution network was lacking. He was also of the opinion that the project would impact positively on the area since it would reduce the amount of ground water extraction.

**5.2.2 *Overview from the Lands Registrar and Land Valuer***

The land registrar and valuer welcomed the Consultants to their County offices and was pleased about the project. The Consultants proceeded to ask land based questions about the project area.

**i) Adjudicated land in the area**

The lands registrar and land valuer stated that many of the land parcels in the area are adjudicated, however many people do not have title deeds. They stated that the land parcels sizes could not be known due to sale and resale of lands with no documentation and absentee landlord to verify the land sizes.

Land issues

The land registrar and valuer stated that the major land issue in the project area and the County in general, was the fact that land owners in the area are either squatters or people with no title deeds. The problem is that most of the coast region was under the Oman Rule in the 15th Century and the Sultan gave the land all along the Kenyan coast to his supporters. Most of these original owners however moved out with the onset of the colonialists and have never returned. The current generations of the owners may not even know about the land along the Kenyan Coast. This situation makes the current occupants (who have been occupying the land since time immemorial) squatters on their ancestral land.

They also said another major land issue was the fact that in some areas the road reserve was not clearly defined. In such situations the land owners come and survey the road and determine what to leave as the reserve hence bringing about irregularities. He went ahead and gave an example of such a section of a road, the Makupa Nairobi road (to Miritini).

Another challenge faced was the presence of professional squatters in Mombasa. There were groups that had made it a business of squatting from one reserve to another and receiving compensation when RAP implementation is taking place in those areas.

Another issue was the fact that in coast there were no water weighthives registered on titles hence during replacement or maintenance difficulties arise.

### **5.2.3 Overview from Program Officer in the District Centre for Early and Child Education and the Principal Education Officer in the County Director of Education Office**

The Program Officer in the District Centre for Early and Child Education stated that the project area would greatly benefit from the project.

#### **i) Current Education System**

The list of the schools and its occupancy both in the affected project area and also county level was gathered in the ministry of education and was as follows:

**Table 5-2: learning Institutions in the Area**

Primary schools	92
Secondary schools	34
Colleges	2
Polytechnics	6
Others (ECD)	700

**Table 5-3: Average No. of Students**

Primary (county)	68041
Secondary (county)	15391
Polytechnics (project area)	150
Colleges (county)	4313
Others, ECD (Project area)	70000



**Table 5-4: Average No. of Teachers**

Primary	1566
Secondary	630
Polytechnics	8
Colleges	152
Others, (ECD)	2000

**Table 5-5: Teacher to Student Ratio**

Primary	1:45
Secondary	1:45
Colleges	1:45
Polytechnics	1:30
Others (ECD)	1:40

The average distance that a student has to cover to school in the project area is 4km whereas the average distance that a student has to cover to school in the county is 5km.

**Table 5-6: School Dropout Rate (%)**

Primary	15%
Secondary	10%
College	1%
Polytechnic	30%

Some of the major causes of this school dropouts stated above were said to be:

- Child labour – Bodaboda, tuktuk
- Early pregnancies – Economic hardships
- Social – cultural – Poor Performance

The education officer from whom the data was acquired was of the opinion that the proposed works under coast water service board would affect the schools positively. This is primarily because it would reduce the cases of spread of waterborne diseases in this schools hence improving the health status of the children and also save on time which would have otherwise been used in fetching water.

**ii) Problems faced by the Schools**

The principal stated that Most of the schools in the area have limited water supply hence forcing them buy from outside sources which may not be reliable.

### **iii) Benefits of the Project**

The Principal Education Officer and Program Officer in the District Centre for Early and Child Education stated that the project will benefit schools in that region, in that hygiene in the schools will be improved.

#### **5.2.4 Overview from the Sub-County Forester**

The sub county forester welcomed the consultants and proceeded to give information that was required by the consultants. She went ahead and informed the consultant that the main forests in the county were mangrove forests and private forests such as the Lafarge and the ngomoni village forest which is as a result of rehabilitation

##### **i) Environmental and issues**

The Sub county forester said that the major environmental issues faced were, solid waste disposal, tree cutting (the mangrove forests are cut down for their firewood and the Lafarge for the wood carvings) and poor attitude from the dwellers about tree plantation, the digging of deep trenches where the pipeline would be placed and left unmanned.

##### **ii) Mitigation measures**

The sub county forester said that some of the measures that would help conserve the environment included: public education on the importance of conserving the environment (the mangroves provide a breeding area for fish and the la farge brings tourism). Another measure was the hastened completion of the project so that the trenches dug could be filled.

The Sub-county forester concluded that the forestry department would benefit from the project due to increased water provision in the project area which encourages tree planting.

#### **5.2.5 Overview from the County Director of Environment**

The county director of environment welcomed us in and proceeded to brief us on the effects of the project in regards to the environment.

Some of the challenges faced in the county included:

The existing sewer line in Mombasa is inadequate and most users on the Island are not well served. They are connected to Kizingo plant which is not functional. Therefore, some of the waste water is directed to the tunnel near Fort Jesus that was meant for storm water. This is why if you look at it during the dry season it runs and yet there is no storm water. Generally most facilities have connected black water systems to storm water systems especially in Tudor and the Central Business District, thus polluting the sea. The homes that are not served have septic tanks and when full, the owners empty it manually to open drains at night or engage exhausters which take the waste to manholes that lead to Kizingo plant which does not work. The population of Mombasa has outgrown the existing sewer system by far. In Changamwe the Kipevu treatment works is functional, but in Miritini most people use latrines and thus pollute underground water.

He informed us that another challenge faced was solid waste disposal. Solid waste is a major problem in Mombasa. There are three dump sites in the city with one of them at Kibarani having been closed by NEMA. One of the dump sites is in contention because it is on the flight path,

attracting birds that may interfere with flights from the Moi International Airport in Mombasa. There are well-wishers who have brought trucks to Mombasa, stationed them strategically in the CBD for the waste collection. This has helped in cleaning up the island.

He further explained that the main environmental effects of the proposed extension to the pipeline are as follows:

- During construction trenching will be a disturbance to pedestrians and communication systems such as fibre optic lines.
- Noise will also be generated because vibrators will be used in rocky areas.
- The project will also need to deal with sanitation challenges for workers, their transportation and safety while working.
- Disposal of decommissioned pipes should be planned ahead of time.

The main positive impacts of the proposed projects also are:

- areas/facilities without water will be served with cleaner and safer water;
- Underground water will be saved as presently many homes have shallow wells where they draw unsafe water for domestic use;
- sanitation conditions will improve and the city will move closer to green city status;
- Incidences of sanitation-related diseases in the town will decline. The main sanitation-related diseases in the town include typhoid and amoebiosis.

The County Director of Environment concluded by saying that his office supports the proposed project which is long overdue because of the acute scarcity of clean water in Mombasa. This office will support and facilitate the process when and as is required.

### **5.3 Public Consultations**

The objectives of public consultations for an EIA exercise were to ensure that:

- All stakeholders and interested parties, were fully informed of the proposed project and given opportunity to raise their concerns;
- Any issues resulting from this process were addressed in the EIA and incorporated into the design and implementation of the project.
- Consultation was done on sensitive issues and that baseline information was established for management of any impacts that may arise during planning, construction and operation phases of the project.

Scheduled public consultations meetings were conducted on 5<sup>th</sup> and 6<sup>th</sup> March 2015 at Tudor's chief's camp in Mombasa island, at St Mary's catholic church in Changamwe in west mainland, at Frere town CDF hall in Kisauni in north mainland and at Licodep hall in likoni in south mainland.

Invitations were sent out through the chiefs and village elders of every area to the following groups:

- CWSB,
- G.O.K Groups – the respective District Administrators, Chiefs and Assistant Chiefs, village elders,
- Local Opinion Leaders in the area
- Political Group Leaders in the area

- PAPS-this included both those who were directly affected i.e. through loss of their land or structure and those indirectly affected, i.e. those who will benefit from the project completion.

A detailed description of the issues is given in the minutes in Appendix C.

## **6 ENVIRONMENTAL 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 (e.g. trenching, excavation, laying of pipelines and construction of water kiosks) and works category (e.g. water supply).

Improving water supply coverage in the Mombasa Island, North Mainland, West Mainland, South Mainland areas and along the pipeline route will have a wide range of environmental and social implications.

In general, successful implementation of the project will have high socio and economic benefits to the people and will contribute to the health and wellbeing. Overall, expected negative impacts are related to pipeline and associated works such as construction of the valve chambers, washouts and water kiosks. 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 6.1 presents a characterisation of expected impacts.

**Table 6-1: 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 route		X	X		X				
Ambient Air Quality	Increased local pollutant emissions and trace constituents such as VOCs Increased GHG emissions such as CH <sub>4</sub> and CO <sub>2</sub>		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 groundwater and ocean from oil spills during construction		X	X			X	X		X
	Surface water pollution from construction wastes		X	X			X	X	X	
	Leakage/ponding from the distribution network.		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		X	X		X			X	X
	HIV/AIDS and increased disease risks.		X	X	X	X	X	X		X
Socio-economics	Improvement of local and regional socio-economy	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 and along the project route		X	X		X	X	X	X	
direct land take	loss of livelihood demolition of structures Loss of farm land and trees		X	X				X		X
Health and safety	Improvement in public health and sanitation through improved potable water supply & reduction in sewer blockages.	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
Water	Increased clean water supply to the target WSP areas by MOWASCO which could reduce incidences of water borne diseases hence significant improvement on public health	X		X		X	X	X		
	Enhanced water quality, quantity and distribution.	X		X		X	X	X		
	Vandalism and illegal connections/tapping		X		X	X	X	X	X	



## 6.1 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.

## 6.2 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)

### 6.2.1 Planning Phase Impacts

This will mainly be the acquisition of land and the pipeline

These are commonly associated with acquisition land for the treatment works, storage tanks and pipeline reserves, and include involuntary relocation where resettlement or land acquisition is foreseen this affects three groups of people:

- i) People affected by the acquisition of land for the project;
- ii) People affected by the temporary use of land for installation of the of the pipeline, and;
- iii) People whose livelihood is impacted.

Several displacement of businesses and structures will occur at the off-take at Mombasa Island. Other centres that will be affected include Mombasa Westland, Mombasa Southland and Mombasa northland.

Mitigation measures
<ul style="list-style-type: none"><li><input type="checkbox"/> The pipeline runs along roads and footpaths, the extension of the lines will be located along footpaths and roads so as to minimise land acquisition. However in the case of unavoidable land take, that land in question shall be acquired in accordance with the applicable law and the previously done Resettlement action plan report.</li><li><input type="checkbox"/> Project affected persons to be identified by type of loss through a detailed resettlement action plan.</li><li><input type="checkbox"/> The affected persons to be compensated for loss of houses and ancillary buildings, land, trees, livelihood productivity, and land improvements</li><li><input type="checkbox"/> MOWASCO to agree with the local community on the form of compensation for loss of land, structures, trees, crops and livelihood (such as water provision etc.). Once the community is fully compensated the contractor may move to site</li><li><input type="checkbox"/> Temporarily used land will be returned to the original land user on completion of works. Short term severance impacts on land parcels will also occur during the construction phase of the project. On construction completion, access routes will be reinstated to their pre-project conditions for both people and animals.</li><li><input type="checkbox"/> The mitigation measures for social impacts are to ensure that the affected persons' livelihood is at least maintained after implementation of the project.</li></ul>

### 6.2.2 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:

#### i) Traffic Congestion

Traffic congestion is anticipated from site related traffic from Contractor vehicles. This may interfere with socio-economic activities which majorly rely on the transport network affected by the construction activities. The proposed project would have minor, short term impacts on transportation, as the sewer mains are anticipated to be installed within the shoulder of existing roads.

<b>Mitigation measures</b>
<ul style="list-style-type: none"> <li><input type="checkbox"/> The Contractor should provide temporary road signs or notices to indicate ongoing works;</li> <li><input type="checkbox"/> The Contractor together with the Resident Engineer should Plan itineraries for site traffic on a daily basis and avoid peak traffic periods;</li> <li><input type="checkbox"/> The Contractor should effect traffic controls and cleanliness to avoid congestion and truck accidents on roads;</li> <li><input type="checkbox"/> The Resident Engineer has to ensure that transportation vehicles are operated during night-time and off-peak hours to avoid peak traffic. With proper vehicle operation control, adverse impacts on the environment and traffic by the transportation will be minimal;</li> <li><input type="checkbox"/> The Resident Engineer and Contractor should choose traffic routes to reduce the impact in the neighborhood avoiding, as far as practical any sensitive areas;</li> <li><input type="checkbox"/> For the site traffic the Contractor has to ensure that they               <ul style="list-style-type: none"> <li>➤ Only park in designated parking areas;</li> <li>➤ Don't block pedestrian routes;</li> <li>➤ Don't block traffic routes;</li> <li>➤ Obey the speed limit</li> <li>➤ The resident Engineer has to ensure that the Contractor:                   <ul style="list-style-type: none"> <li>• Introduces segregated pedestrian walkways;</li> <li>• Introduces speed limits;</li> <li>• Reduces the need for reversing vehicles, by introducing a one way system;</li> <li>• Uses a qualified BANKSMAN to control deliveries and reversing vehicles;</li> <li>• Designates loading/unloading areas.</li> </ul> </li> </ul> </li> </ul>

**ii) Site Related Oil Spills**

During construction, oil spills may result from construction site equipment and storage.

<b>Mitigation Measures</b>
<ul style="list-style-type: none"> <li><input type="checkbox"/> The Contractor should ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks for the construction machinery through induction and safety training;</li> <li><input type="checkbox"/> • In case of spillage the Contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent material and/or other materials approved by the Resident Engineer;</li> <li><input type="checkbox"/> • The Resident Engineer and the Contractor should 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;</li> <li><input type="checkbox"/> • All vehicles and equipment should be kept in good working order, serviced regularly and stored in an area approved by the Resident Engineer;</li> <li><input type="checkbox"/> • The Contractor should assemble and clearly list the relevant emergency telephone contact numbers for staff, and brief staff on the required procedures.</li> <li><input type="checkbox"/> All vehicle works should be done in one place to avoid chances of spillage in different parts of the camp</li> </ul>

### iii) Soil-Related Impacts

All construction activities have some minor impacts on the soil. However, these are localised and restricted locally to the excavation of trenches for the water pipes. 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, piling of soil along public access routes, improper replacement of soil to its original position, mixing of layers and compaction thus reducing the ecological function of the soil.

Mitigation Measures
<ul style="list-style-type: none"><li><input type="checkbox"/> The valuable top soil containing organic material, nutrients as well as seeds and the soil fauna would be excavated separately and piled in an adequate manner for re-use.</li><li><input type="checkbox"/> In cases where it is identified that during construction there is a danger of increased run-off or erosion of trenches, temporary drainage channels or holding ponds can be employed</li><li><input type="checkbox"/> After completion of the construction works, immediate restoration spreading piled top soil and by sowing adequate grass cover and planting of trees will be followed, therefore the impact is temporary and reversible.</li><li><input type="checkbox"/> Plan emergency response measures in case of accidental oil spills.</li></ul>

### iv) Impact on Water Resources

Potential environmental impacts associated with water resources include sedimentation, foreign material spills, pollution slumping, disturbance to drainage and removal of vegetation. Vegetation and solid waste, if allowed to accumulate in water ways, may cause localised pooling and flooding.

Improper handling of construction wastes and increased waste water production may cause pollution of the Ocean. This may affect the oceanic eco-system including fish and other marine organisms.

Mitigation
<ul style="list-style-type: none"><li><input type="checkbox"/> Construction materials and other debris (lime, cement and fresh concrete, etc.) shall be prevented from entering waterways.</li><li><input type="checkbox"/> Ensure protection of the Ocean ecosystem by proper handling of cement during civil works. Examples of good practices while handling cement include:<ul style="list-style-type: none"><li>▪ Cement mixing should be done in a designated area away at a safe distance from natural water courses;</li><li>▪ Sensitize workers and enable them to properly handle concrete spillages or waste cement.</li></ul></li></ul>

### v) Social - 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. masonry workers, plumbers, 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, farmers will also benefit

from higher income levels as they sell their products. New businesses will grow such as food vending to construction workers

With availability of tap water there will be a possibility of increased investor interest in tourism related developments in the area and possible increase in property values for land with access to piped water.

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

<b>Mitigation</b>
<ul style="list-style-type: none"><li><input type="checkbox"/> 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.</li><li><input type="checkbox"/> Use of manual labor during trenching works where possible to ensure more employment of locals and hence ensure project support throughout the construction process.</li><li><input type="checkbox"/> 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.</li></ul>

#### **vi) Air Quality**

Construction activities of bush clearing, materials delivery, trench excavation and construction traffic will generate a lot of noise and dust especially during the dry seasons. The area is predominantly dry thus dust is already a pre-existing problem.

Vehicular traffic to the proposed sites 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. The access roads are earth roads. Trucks with heavy loads will further damage these earth roads.

<b>Mitigation:</b>
<ul style="list-style-type: none"><li><input type="checkbox"/> Use protective clothing like helmets and dust masks on construction crew.</li><li><input type="checkbox"/> Construction sites and transportation routes 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.</li><li><input type="checkbox"/> All the vehicles and construction machinery should be operated in compliance with relevant vehicle emission standards and with proper maintenance to minimize air pollution.</li><li><input type="checkbox"/> Digging of trenches should be done manually so as to avoid too many trucks and machines in the area. The use of manual labor will also benefit the community socio-economically.</li><li><input type="checkbox"/> Use of other dust palliative measures to reduce dust emissions</li></ul>

#### **vii) Construction Noise and vibration**

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.

**Mitigation:**

- Avoid night time construction when noise is loudest. Avoid night-time construction using heavy machinery, from 22:00 to 6:00 near residential areas.
- No discretionary use of noisy machinery within 50 m of residential areas and near institutions such as schools
- Good maintenance and proper operation of construction machinery to minimize noise generation.
- Installation of temporary sound barriers if necessary.
- Selection of transport routes for large vehicles to avoid residential areas.
- Where possible, ensure non mechanized construction. This includes, employing locals during the trench excavation.

**viii) Biodiversity and Conservation Impacts**

Removal of vegetation as well as trees will lead to loss of plants and animal habitat. The bio-diversity affected includes insects such as butterflies and worms, small mammals, reptiles and birds. Water contamination with cement will cause it to be highly alkaline and toxic to plants and animals living in watercourses.

**Mitigation:**

- Re-plant the indigenous vegetation as much as practical once work is completed.
- Spare the vegetation that must not necessarily be removed such as trees.
- Minimize the amount of destruction caused by machinery by promoting non-mechanized methods of construction.
- Ensure protection of the Coastal ecosystem by proper handling of cement during civil works.
- Cement mixing should be done in a designated area away at a safe distance from natural water courses.
- Spilled cement or concrete should be collected and disposed away from natural water ways or storm water drainage;
- Sensitize workers and enable them to properly handle concrete spillages or waste cement.

**ix) Public Health, Safety & HIV & AIDS Impacts**

Construction staff and the general public will be exposed to safety hazards arising from construction activities. The main pipeline is to be placed along major roads together with a distribution system along rural access roads and footpaths these roads have pedestrian and vehicular traffic and this may cause an increase in the number of accidents.

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

Construction activities of bush clearing, materials delivery, trench excavation 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.

In migration of people from different regions may lead to behavioural influences which may increase the spread of diseases such as HIV/AIDS. Improper handling of solid wastes produced during and civil works such as spoil from excavations, scrap metal, mortar, paper, masonry chips and left over food stuff present a public nuisance due to littering or smells from rotting. Open trenches during the project duration pose a risk to the general public as they access the different sides of the trenches.

Improved clean water supply to the area will lead to improved public health and quality of life through reduced risk of waterborne and water-related diseases; and increased public satisfaction.

<b>Mitigation:</b>
<ul style="list-style-type: none"><li><input type="checkbox"/> Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards.</li><li><input type="checkbox"/> Establish a Health and Safety Plan (HASP) for both civil and electromechanical work.</li><li><input type="checkbox"/> Appoint a trained health and safety team for the duration of the construction work.</li><li><input type="checkbox"/> Use of dust masks while working in dusty environment to avoid respiratory related sicknesses.</li><li><input type="checkbox"/> Provide workers with appropriate personal protective equipment (PPE).</li><li><input type="checkbox"/> Provide workers with adequate drinking water and breaks.</li><li><input type="checkbox"/> Provide workers training on safety procedures and emergency response such as fire, oil and chemical spills, pipe bursts and other serious water loss risks.</li><li><input type="checkbox"/> Roads passing through population centers will be water sprayed to reduce dust.</li><li><input type="checkbox"/> 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.</li><li><input type="checkbox"/> Work to minimize or altogether eliminate mosquito breeding sites.</li><li><input type="checkbox"/> Provide appropriate human and solid waste disposal facilities</li><li><input type="checkbox"/> Provide crossing points along the trenches to allow people to maintain their normal activities, also cautionary signage should be provided along the trenches.</li><li><input type="checkbox"/> Provide clean toilets for workers</li></ul>

#### **x) Service Delivery Impacts**

The construction activities will cause disruption of services such as water supply and transportation within the project area. Where the water pipe crosses the road, excavation of trenches and laying down of the water pipes may cause disruption of transport within the project area. Trucks with heavy loads of construction materials may damage murrum roads during the construction process. The trucks may get stuck on bad road sections (sandy soil is difficult to negotiate through) and these may cause disruption of transport.

The current water storage facilities may not be enough to handle emergencies brought on by the interruption in water supply. Areas of special attention include the learning and health care institutions.

The completion of the water project will alleviate the water problem and ensure better management of water supply as water losses will be detected. Metering will allow better pricing of water resources and could contribute to better water use management by consumers. Improved clean water supply to the area, sanitation and hygiene for residents with access to tap water will lead to improved public health and quality of life through reduced risk of waterborne and water-related diseases; and increased public satisfaction within the project area. This will lead to population growth and informal

settlements causing increased waste water production and increased demand for emergency water supply from existing reservoirs.

<b>Mitigation:</b>
<ul style="list-style-type: none"><li><input type="checkbox"/> Provide appropriate signage to warn motorists and other road users of the construction activities, diversion routes to ward off traffic accidents.</li><li><input type="checkbox"/> 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.</li><li><input type="checkbox"/> Areas being trenched to be temporarily cordoned off to avoid people and animals accidentally falling into open trenches.</li><li><input type="checkbox"/> In the event that delivery trucks damage parts of the road, repair the spots in consultation with the local authorities.</li><li><input type="checkbox"/> Provide adequate water storage facilities to ensure adequate supplies to meet the new demand.</li><li><input type="checkbox"/> Ensure proper maintenance of the water works</li><li><input type="checkbox"/> Use pipes of good quality materials</li></ul>

#### **xi) 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.

The increase in the distribution of water to the inhabitants will immediately transform their ways of life, especially for women who are the first concerned when it comes to water supplies. Women who are the main economic players will have more time to spend on other economic activities.

<b>Mitigation:</b>
<ul style="list-style-type: none"><li><input type="checkbox"/> Ensure equitable distribution of employment opportunities between men and women</li><li><input type="checkbox"/> Provide toilets and bathrooms for both male and female workers on site</li></ul>

#### **6.2.3 Impacts during Operation & Maintenance**

During the operation of the constructed water supply project no substantial negative environmental and social impacts and risks are anticipated.

#### **i) Socio - economic potential positive or beneficial impacts**

Numerous socio-economic potential positive or beneficial impacts from successful implementation of the project will include:

- 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;



- Increase in tourism in the area. The project area has many tourist attractions and destinations such as the 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.
- 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 on 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.

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

**ii) Generation of both solid and liquid 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 town and its environs currently have few sewerage or sanitation facilities such as the Kizingo sewerage facilities. Majority of the stakeholders within the project area, use septic tanks.

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.

<b>Mitigation measures:</b>
<ul style="list-style-type: none"><li><input type="checkbox"/> 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.</li><li><input type="checkbox"/> Put in place adequate and efficient sanitary facilities for handling liquid waste especially waste water to protect the ocean from pollution.</li><li><input type="checkbox"/> Come up with regular trash collection system in the site areas so as to avoid accumulation of waste.</li><li><input type="checkbox"/> In the long term the MOWASCO should invest in a waste water collection and treatment system for Mombasa town and its environs to ensure proper handling of waste water in addition to the expansion of Kizingo plant. This would also help in protecting local environment from possible contamination with direct sewage.</li></ul>

**iii) Leaks and burst**

During the project duration there may be leaks and bursts caused by various reasons such as excessive pressures, illegal connections, among others

**Mitigation measures:**

- A program of leak detection to be put in place to identify aging pipes for replacement to avoid major bursts and frequent repairs. In case of unavoidable major repairs, mitigation measures similar to those applied during construction to reduce the impacts of noise, dust, disturbance of flora and fauna.
- Leaks and pipe bursts to be promptly repaired to avoid contamination of water resources especially shallow ground water.
- Constant policing of network to check for illegal connections

**iv) Noise**

Noise nuisance from vehicles and repair equipment. During O&M activities vehicles are required for inspection of pipelines to detect any leakage and repair equipment is required in case need arises and in the process of these activities undesirable noise will be generated.

**Mitigation measures:**

- During normal operations the noise generated from vehicles has insignificant impact. However during major repairs the equipment used can generate unacceptable levels of noise and mitigation measures similar to those applied during construction to be used.

**v) Impact on Water Resources**

As mentioned earlier the generated solid and liquid waste from the project area will make itself through its natural water courses, including ground water, back to the Indian Ocean. Thus the entire water system and as a result the ecological system will be negatively affected.

**Mitigation measures:**

- Wastewater will be channelled to the sewerage system if available or constructed septic tanks. Pit latrines can be used where sewerage system is not available or where construction of septic tank is not feasible.
- All solid waste will be collected from generation points, safely transported to the central place where it is sorted out by type and then safely disposed according to type.

**vi) Socio - Economic Impacts**

The expected improvements in metering and administrative billing procedures are likely to cause social and economic impact as this may result in higher water bills.

**Mitigation measures:**

The project is currently making use of the MOWASCO approved rates and this impact is not foreseen

**vii) Impact on flora and fauna.**

Impact associated with repair and replacement activities when there are leaks or bursts on pipelines will be loss of vegetation and disturbance flora and fauna.

**Mitigation measures:**

- A program of leak detection to be put in place to identify aging pipes for replacement to avoid major bursts and frequent repairs. In case of unavoidable major repairs, mitigation measures similar to those applied during construction to reduce the impacts of disturbance of flora and fauna.
- Leaks and pipe bursts to be promptly repaired to avoid contamination of water resources especially shallow ground water.
- After the repair works the land to be levelled to allow vegetation regeneration.

**viii) Archaeology**

The known archaeological sites within the existing MOWASCO WSP area should be identified during the construction phase and assessed. As the water distribution network has been in existence, there are no new expected archaeological finds. However, should new material sites be located within the area, any archaeological finds in these material sites should be cordoned off, shut down and reported to the National Museums of Kenya.

**6.2.4 *Impacts during De-commissioning***

De-commissioning of the Project is not envisaged. Project components however will be rehabilitated over time having served their useful life.

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## **7 ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT PLAN (ESMMP)**

By design, the potential positive impacts of the project can readily be optimised while the potential negative environmental and social impacts are mostly restricted to the planning and construction period. 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.

### **7.1 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.
- Ensure that the poor and other vulnerable groups adjacent or along the pipeline route will be catered for by the project to safely satisfy their basic water needs in future.
- Ensure that social services provide education on appropriate hygienic conditions and water conservation, taking into consideration gender particular roles and responsibilities.
- Carrying out periodic assessment of different components of the water production, transmission and distribution system to initiate immediate rehabilitation whenever problems are identified to reduce system leakage and bursts losses.

### **7.2 Mitigation Measures**

Mitigation measures for negative environmental impacts include the following:

- Construction site environmental and social management plans, prepared by the contractor, will be required for all works. This plan will include a waste management plan for all activities during the construction period.
- Air pollution due to dust when excavated material is stockpiled, should be limited by working in small sections so that the trenches are backfilled with excavated materials within shortest possible period.
- Avoid hampering drainage of surface water and plan for restoration measures after construction.
- Construction activities should be scheduled appropriately to reduce high noise levels particularly at night from noisy activities.
- Avoid areas sensitive to erosion.
- Avoid establishing temporary access roads along steep slopes
- At the end of construction works, level off the soils and facilitate vegetation regeneration.
- Minimize land clearing areas by employing mechanization only when necessary. Most of the work should be done by hand.
- Prevention of work place injuries during construction is taken care of by the contractors, e.g. by means of signs, signals, fencing, etc.

- Carry out specific Environmental Assessment and preparation of a hazardous material management plan for handling such materials that will be identified during the construction stage of the Project.
- Employ occupational Safety and Health measures as required by law.

Mitigation measures have already been discussed in Chapter 6. However, a brief summary is included in the Environmental and Social Mitigation and Management Plan (ESMMP) in Table 7-1: The Proposed Environmental and Social Mitigation and Management Plan (ESMMP). Also considered in this management and monitoring plan are the persons responsible for implementation.

**Table 7-1: The Proposed Environmental and Social Mitigation and Management Plan (ESMMP)**

<b>Environmental / Social Impact</b>	<b>Mitigation Action Plan</b>	<b>Responsibility</b>
Land acquisition for laying of pipeline	The pipelines will be laid within the existing road reserves as much as possible. In case there is need for private land acquisition then compensation to be done according to the prevailing market rates in the area.	MOWASCO
Loss of structures	As a first step, the owners, type of structures and businesses are identified. The compensation will be done at replacement cost.	MOWASCO
Loss of livelihoods	Loss of livelihoods to be valued and compensated to ensure that project affected persons (PAPs) continue with their normal lives(or better) as before the project	MOWASCO
Loss of flora and fauna	Site clearance should be limited to the minimum area required for the execution of the works.  The records of the number and tree species cut to be kept.  Replanting of indigenous trees after the project is completed.  Top soil should be stockpiled separately from the subsoil. After completion of works, the subsoil should be backfilled first then top soil should be restored on top to facilitate natural regeneration of those areas.	Contractor  Supervisor – project Engineer to consult  KFS on appropriate replanting seedlings  Sub-County Environmental officer
Air pollution	Vehicles and other equipment emissions would be kept to a minimum by servicing and maintaining the equipment to manufacturer's specification. In, addition the contractor to be encouraged to use unleaded and low sulphur content petrol and diesel respectively for all equipment and vehicles	Contractor  Supervising Engineer

Environmental / Social Impact	Mitigation Action Plan	Responsibility
	The Contractor should also make use of the readily available labour for carrying out construction activities.	
Noise and Dust	<p>Use protective clothing like helmets and dust masks on construction crew.</p> <p>Avoid night time construction when noise is loudest. Avoid night-time construction using heavy machinery, from 22:00 to 6:00 near residential areas;</p> <p>No discretionary use of noisy machinery within 50m of residential areas;</p> <p>Good maintenance and proper operation of construction machinery to minimise noise generation;</p> <p>Installation of temporary sound barriers if necessary; and</p> <p>Construction sites and transportation routes will be water-sprayed on dry and windy days up to three times a day, especially if these sites are near sensitive receptors, such as residential areas or institutions.</p>	Contractor Supervising Engineer
Generation of solid and liquid waste	<p>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.</p> <p>Put in place adequate and efficient sanitary facilities for handling liquid waste especially waste water to protect the river from pollution.</p> <p>Wastewater from residential quarters and offices to be directed to constructed septic tanks for safe handling.</p> <p>Pit latrines can be used in areas where the other services are not available or feasible</p>	Contractor Supervising Engineer MOWASCO
Pollution of water resources	<p>Ensure proper solid and liquid wastes disposal mainly from the construction camps and offices.</p> <p>Ensure proper measures are in place for collection and disposal of spilled oils and lubricants.</p>	Contractor, Supervising Engineer District Water Officer

Environmental / Social Impact	Mitigation Action Plan	Responsibility
Health and safety	<p>Provision of Personal Protective Equipment (ear muffs, gloves, dust masks and helmets) for the construction crew</p> <p>Employ a safety and health officer on site.</p> <p>Provide First aid kit and appropriate procedures and safety measures</p> <p>Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards.</p> <p>Provide workers training on safety procedures and emergency response such as fire, oil and chemical spills, pipe bursts and other serious water loss risks.</p> <p>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.</p> <p>Provide information, education and communication about safe uses of drinking water.</p> <p>Provide condom dispensers at appropriate locations coupled with awareness campaigns to workers and surrounding communities on HIV/AIDS throughout the construction period</p> <p>Provide enough toilets within the camp</p> <p>Work to minimize or altogether eliminate mosquito breeding sites.</p> <p>Provide appropriate human and solid waste disposal facilities</p> <p>In general comply with operating occupational health and safety law requirements</p>	Contractor Supervising Engineer MOWASCO
Unaccounted For Water (UFW)	<p>Ensure proper and accurate records on production and consumption are kept through metering to detect any UFW in the system. Have a leak detection program to identify aging pipes for replacement to control UFW. Any leakages and bursts to be repaired promptly. If these standards are met the tariffs are likely to be within affordable range.</p>	MOWASCO beneficiaries

<b>Environmental / Social Impact</b>	<b>Mitigation Action Plan</b>	<b>Responsibility</b>
Traffic Congestion	<p>Provide temporary road signs or notices to indicate ongoing works</p> <p>Plan itineraries for site traffic on a daily basis and avoid peak traffic periods;</p> <p>Effect traffic controls and cleanliness to avoid congestion and truck accidents on roads to ensure that transportation vehicles are operated during night-time and off-peak hours to avoid peak traffic. With proper vehicle operation control, adverse impacts on the environment and traffic by the transportation will be minimal;</p> <p>Choose traffic routes to reduce the impact in the neighbourhood avoiding, as far as practical any sensitive areas;</p>	The Contractor Supervising Engineer
Gender balance	<p>Ensure equitable distribution of employment opportunities between men and women</p> <p>Provide toilets and bathrooms for both male and female workers on site</p>	The contractor The Supervising Engineer
Service Delivery	<p>Provide appropriate signage to warn motorists and other road users of the construction activities, diversion routes to ward off traffic accidents.</p> <p>Communicate any intended disruption of the services to enable the people to prepare e.g. by having emergency water storage and provision facilities.</p> <p>Areas being trenched to be temporarily cordoned off to avoid people and animals accidentally falling into open trenches.</p> <p>In the event that delivery trucks damage parts of the road, repair the spots in consultation with the local authorities.</p> <p>Provide adequate water storage facilities to ensure adequate supplies to meet the new demand.</p> <p>Ensure proper maintenance of the water works</p> <p>Use pipes of good quality materials</p>	The Contractor



## 8 ENVIRONMENTAL MITIGATION COST ESTIMATES

The cost of some of the proposed mitigation measures will have been included in the main engineering Bills of Quantities and therefore need not be included in the Environmental mitigation costs. These costs will also include cost of supervision for implementation of mitigation measures.

Table 8-1 shows cost estimates for environmental mitigation. The brief description of the items is for identification purposes and does not supersede or modify the detailed descriptions of works in other sections of this report.

**Table 8-1: Cost Estimates for Environmental Mitigation**

S/No.	Item description	Unit	Quantity	Unit Price (KES)	Item Cost (KES)
1	Emergency measures in case of accidental oil spill	LS	1	300,000.00	300,000.00
2	Emergency measures in case of accidental water contamination	LS	1	1,000,000.00	1,000,000.00
3	On completion of construction works, reinstatement of ground for vegetation regeneration	Ha	10	200,000.00	2,000,000.00
4	Provide waste collection bins at strategic points and ensure that all solid wastes are transported to a place of safe disposal	No.	100	2,000.00	200,000.00
5	Provide Personal Protective Equipment (PPE) to the construction crew – helmets, overalls, gum boots, earplugs and dust masks.	set	1200	5,000.00	6,000,000.00
6	Sensitize workers and the surrounding community on awareness, prevention and management of HIV/AIDS and other STDs through staff training, awareness campaign, media, and sign boards in local languages, workshops and during public Barazas.	Item	10	500,000.00	5,000,000.00
7	In collaboration with the Ministry of Health provide VCT centres	No.	12	500,000.00	6,000,000.00

S/No.	Item description	Unit	Quantity	Unit Price (KES)	Item Cost (KES)
8	Provide condom dispensers at appropriate locations	LS	1	1,000,000.00	1,000,000.00
9	Provide both male and female toilets at strategic points within the site	No.	20	100,000.00	2,000,000.00
10	Spraying Mosquito breeding sites	LS	1	500,000.00	500,000.00
11	Provide signage at construction sites to control traffic to avoid accidents	LS	1	3,500,000.00	3,500,000.00
12	Formulate a Healthy and Safety Management Plan, train workers on health and safety procedures and emergency response in case of a fire outbreak, and other risks	LS	1	2,000,000.00	2,000,000.00
13	Environmental supervision, monitoring, and evaluation over a period of 18 calendar months	Months	18	400,000.00	7,200,000.00
14	Provisional sum to be spent as directed by the Engineer on miscellaneous environmental issues like sampling and testing	LS	1	6,000,000.00	6,000,000.00
	<b>TOTAL</b>				<b>42,700,000.00</b>

## **9 ENVIRONMENTAL AND SOCIAL MONITORING PLAN**

The purpose of the Environmental and Social Monitoring Plan (ESMP) for the proposed project is to initiate a mechanism for implementing mitigation measures for the potential negative environmental impacts and monitor the efficiency of these mitigation measures based on relevant environmental indicators. The Environmental and Social Mitigation and Management Plan in Chapter 7 identified certain roles and responsibilities for different stakeholders for implementation, supervision and monitoring. The objectives of the ESMP 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 9-1 presents the indicators that will be used to monitor the implementation of the pipeline project. The indicators are selected based on the project and major anticipated impacts.

**Table 9-1: Proposed Environmental Monitoring Plan**

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Corrective Action
Contractors campsite	Land take	<ul style="list-style-type: none"> <li>The land acquired for each component</li> <li>Number of structures demolished</li> <li>Number of complaints on compensation.</li> </ul>	<ul style="list-style-type: none"> <li>Number of people compensated for land, structures and livelihood.</li> <li>Compensation details</li> </ul>	Implement recommendations of ESIA report
	Noise	<ul style="list-style-type: none"> <li>Number of complaints</li> <li>Distance from human settlements</li> <li>Limit of acceptable noise standard issued by NEMA</li> </ul>	<ul style="list-style-type: none"> <li>Liaise with other stakeholders.</li> <li>Documentation on complaints about noise</li> </ul>	Implement recommendations of ESIA report.
	Air pollution	<ul style="list-style-type: none"> <li>Number of complaints on dust nuisance</li> <li>Distance from human settlements</li> </ul>	<ul style="list-style-type: none"> <li>Physical inspection</li> <li>Interview residents including workers</li> </ul>	Implement recommendations
	Water pollution	<ul style="list-style-type: none"> <li>Number of complaints on pollution of water by downstream users</li> <li>Obstruction of waterways</li> </ul>	<ul style="list-style-type: none"> <li>Liaise with other stakeholders</li> <li>Level of complaints</li> <li>Physical inspection</li> </ul>	In case of pollution investigate cause Implement corrective measures
	Occupational Health and Safety	<ul style="list-style-type: none"> <li>Healthy and safety awareness among staff</li> <li>Number of accidents and fatalities</li> <li>Number of HIV awareness campaign meetings held</li> <li>Outpatient attendance register</li> <li>First aid facilities in place</li> <li>Compliance with Occupational Health and Safety Act (OSHA)</li> </ul>	<ul style="list-style-type: none"> <li>Documentation</li> <li>Interviews with workers and management</li> <li>Liaise with other stakeholders</li> </ul>	Investigate non-compliant issues Implement corrective measures
	Solid and liquid wastes	<ul style="list-style-type: none"> <li>Presence or absence of scattered litter.</li> <li>Flow of wastewater on the ground surface</li> <li>Level of complaints on hygienic conditions and pollution of water sources.</li> </ul>	<ul style="list-style-type: none"> <li>Physical inspection of site and sanitation facilities</li> <li>Documentation in grievance register</li> </ul>	Implement corrective measures
	Construction Camp	Public health and safety	<ul style="list-style-type: none"> <li>Prevalence rates of common diseases.</li> <li>Provision of condoms, contraceptives and mosquito nets.</li> <li>Conduction of campaign meetings on transmission of diseases like HIV/AIDS and other STDs.</li> </ul>	<ul style="list-style-type: none"> <li>Physical inspection</li> <li>Documentation Number of complaints</li> <li>Interview with residents</li> </ul>

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Corrective Action
Pipeline route	Solid and liquid wastes	<ul style="list-style-type: none"> <li>• Availability of adequate solid waste bins.</li> <li>• System of safe disposal of both solid and liquid waste in place.</li> <li>• Availability of first aid facilities.</li> <li>• Outpatient attendance registers.</li> <li>• Compliance with the Health and Safety Act.</li> </ul>	<ul style="list-style-type: none"> <li>• Physical inspection</li> <li>• Number of complaints.</li> </ul>	Implement recommendations
	Solid and liquid wastes	<ul style="list-style-type: none"> <li>• Presence of scattered litter.</li> <li>• Signs of obstruction of water courses.</li> <li>• Scattered litter</li> <li>• Signs of obstruction of water ways.</li> <li>• Flow of wastewater on the ground surface.</li> <li>• Provision of sanitary facilities to the construction crews.</li> </ul>	<ul style="list-style-type: none"> <li>• Physical inspection</li> <li>• Number of complaints</li> </ul>	Implement recommendations
	Land, Population growth, Migration and settlements	<ul style="list-style-type: none"> <li>• Changes in the value of land.</li> <li>• Changes in type of housing.</li> <li>• Population growth and ethnic composition.</li> <li>• New settlements established and migration closer to the pipelines.</li> </ul>	<ul style="list-style-type: none"> <li>• Physical inspection</li> <li>• Liaise with other stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Implement corrective measures</li> </ul>
	Noise	<ul style="list-style-type: none"> <li>• Level of noise generated.</li> <li>• Provision of PPE.</li> <li>• Compliance with existing noise standard issued by NEMA.</li> </ul>	<ul style="list-style-type: none"> <li>• Liaise with other stakeholders.</li> <li>• Documentation on complaints about noise</li> </ul>	<ul style="list-style-type: none"> <li>• Implement recommendations</li> </ul>
	Air pollution	<ul style="list-style-type: none"> <li>• Level of dust generated.</li> <li>• Provision of PPE.</li> </ul>	<ul style="list-style-type: none"> <li>• Physical inspection</li> <li>• Interview residents including workers</li> <li>• Liaise with other stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Implement recommendations</li> </ul>
All	Social and Economy	<ul style="list-style-type: none"> <li>• School dropout rate.</li> <li>• Employment created directly and indirectly for men and women.</li> <li>• New businesses established.</li> <li>• Prevalence of unplanned new developments</li> <li>• Increased income leading to better living standards.</li> </ul>	<ul style="list-style-type: none"> <li>• Physical inspection</li> <li>• Records from the ministry of Education</li> <li>• Employment records</li> </ul>	<ul style="list-style-type: none"> <li>• Implement recommendations</li> </ul>

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Corrective Action
		<ul style="list-style-type: none"><li>• Improved health due to access to potable water.</li><li>• Reduction of water borne diseases.</li><li>• Increase in school enrolment of school going age children.</li><li>• Improved school attendance by pupils and student</li></ul>		

## **10 CONCLUSIONS AND RECOMMENDATIONS**

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

The implementation of the proposed Water Supply Project has the following benefits:

There will be an increased supply of clean water to Mombasa County and along the pipeline route. This will in turn lead to an improvement in the public health of the population due to the reduction of water related ailments.

The water supply to communities through off-takes and pipeline extension will reduce the time required and distance travelled to fetch water. This time so availed can be used in other economic activities thus enhancing the quality of life and living standards in the project area.

Employment and skills transfer opportunities will be created for the local population; this will improve the general socio-economic wellbeing of the community

The negative environmental impacts identified are mostly confined to the construction phase of the project. Mitigation measures proposed are adequate and will be monitored and evaluated during project implementation.

The recommendations and issues which arose from public participation and consultation have been effectively highlighted and incorporated in the report after the said public participation and consultation meetings were held.

The ESIA concludes that the project will have substantial positive environmental benefits. It will supply sufficient potable water to meet projected future demands of domestic and other uses in the project area.

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 direct land take, demolition of structures and livelihood will be done through a detailed Resettlement Action Plan.

## **11 REFERENCES**

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- Republic of Kenya, Water Act (2002), Government Printer, Nairobi
- Republic of Kenya, Water Supply Design Manual (MWI, 2005), Government Printer, Nairobi
- Republic of Kenya, Public Health Act, Cap 242, Government Printer, Nairobi.
- Republic of Kenya, Environmental Impact Assessment/Audit Regulations 2003, (Legal Notice No.101) Government Printer, Nairobi
- The Government Fisheries Protection Act
- The Constitution of Kenya 2010
- The Land Act, No. 6 of 2012
- World Bank Operational Policies



## 12 APPENDICES

### 12.1 Appendix A Sample Household Questionnaire Administered **PROPOSED WORKS CONTRACTS UNDER COAST WATER SERVICES BOARD**

#### **ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT SURVEY QUESTIONNAIRE**

An Environmental and Social Impact Assessment Survey is being carried out for the proposed water supply projects on behalf of the Coast Water Services Board (CWSB). 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) Village..... (2) Location .....
- (3)Division -..... (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? (tick)
- (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? (tick)
- (1) None ..... (2) Primary ..... (3) Secondary ..... (4) College/university .....
- 2.6 What is the occupation /economic activity of the household head
- (1) Crop farming ..... (2) Livestock farming ..... (3) Formal employment .....
- (4)Business ..... (5) Others (specify) .....
- 2.7 If crop farming what type of crops? (1) Maize..... (2) Cashew nuts ..... (3) Millet..... (4)
- Sorghum ..... (5) Beans..... (6) Coconut..... (7) Others.....
- 2.8 If livestock farming how many?
- (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) Sale of animals..... (4) Jua kali ..... (5) Grocery ..... (6) Agro vet ..... (7) Posho mill ..... (8) Others (specify) .....

(1) What is the average combined household income per month? (tick) (1)Less than 10,000..... (2) 10,000-20,000..... (3)20,000-30,000..... (3)30,000-50,000..... (4) Above 50,000 .....

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

2.11 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 common source of water in this area?

(1) Private tap ..... (2) Public Tap ..... (3) Bore hole ..... (4) Shallow well ..... (5) Protected spring /river ..... (6) Water pan ..... (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 Fetch water?

(1) Every day ..... (2) Every alternate day of the week ..... (3) Once a week .....

3.5 Is the water Supply source adequate (Tick)

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

3.6 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 If yes how much per 20 liter jerrican in Ksh.

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

3.10 What is the common mode of transporting water in this area?

(1) Carrying on the head ..... (2) Hand driven carts/wheelbarrow..... (3) Bodaboda (bicycle/motorbike)..... (4) Pack animals (Donkeys/Camels) ..... (5) Animal drawn carts ..... (6) Trucks ..... (7)Others (specify) .....

3.11 What challenges do you face in transporting water

(1) Loss of time ..... (2) Physical fatigue due to travelling for long distances ..... (3) Others (specify) .....

- 3.12 How do you dispose of your household waste? (Tick)
- 3.13 (1)Compost pit/burying ..... (2) Collection by the council ..... (3) Recycling ..... (4) Burning ..... (5) Dumping in open areas ..... (6) Others (specify) .....
- 3.14 Does the household have a toilet?  
(1)Yes ..... (2) No .....
- 3.15 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) ..... (5)Any other (Specify) .....
- 3.16 Are you aware of the proposed Works under Coast Water Services Board?  
(1) YES ..... (2) NO .....
- 3.17 How will proposed Works under Coast Water Services Board affect the community here? (Tick)  
(1) Positively ..... (2) Adversely (negatively).....
- 3.18 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) .....
- 3.19 If negatively, in what ways? (Tick)  
(1) Dust and noise ..... (2) Demolition of structures ..... (3) Loss of farm land/trees/crops ..... (4) Soil erosion ..... (5) Interruption of services (water, electricity, transport) ..... (6) Spread of diseases (STD, HIV/AIDS)..... (7) Others (specify) .....
- 3.20 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 center..... (2) Prayed for ..... (3) Take herbs..... (4) Visit a traditional doctor..... (5) 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) Overgrazing ..... (4) Extinction of endangered species ..... (5) Mosquitoes and malaria spread ..... (6) Solid waste ..... (7) Deforestation ..... (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) Others (please specify) .....

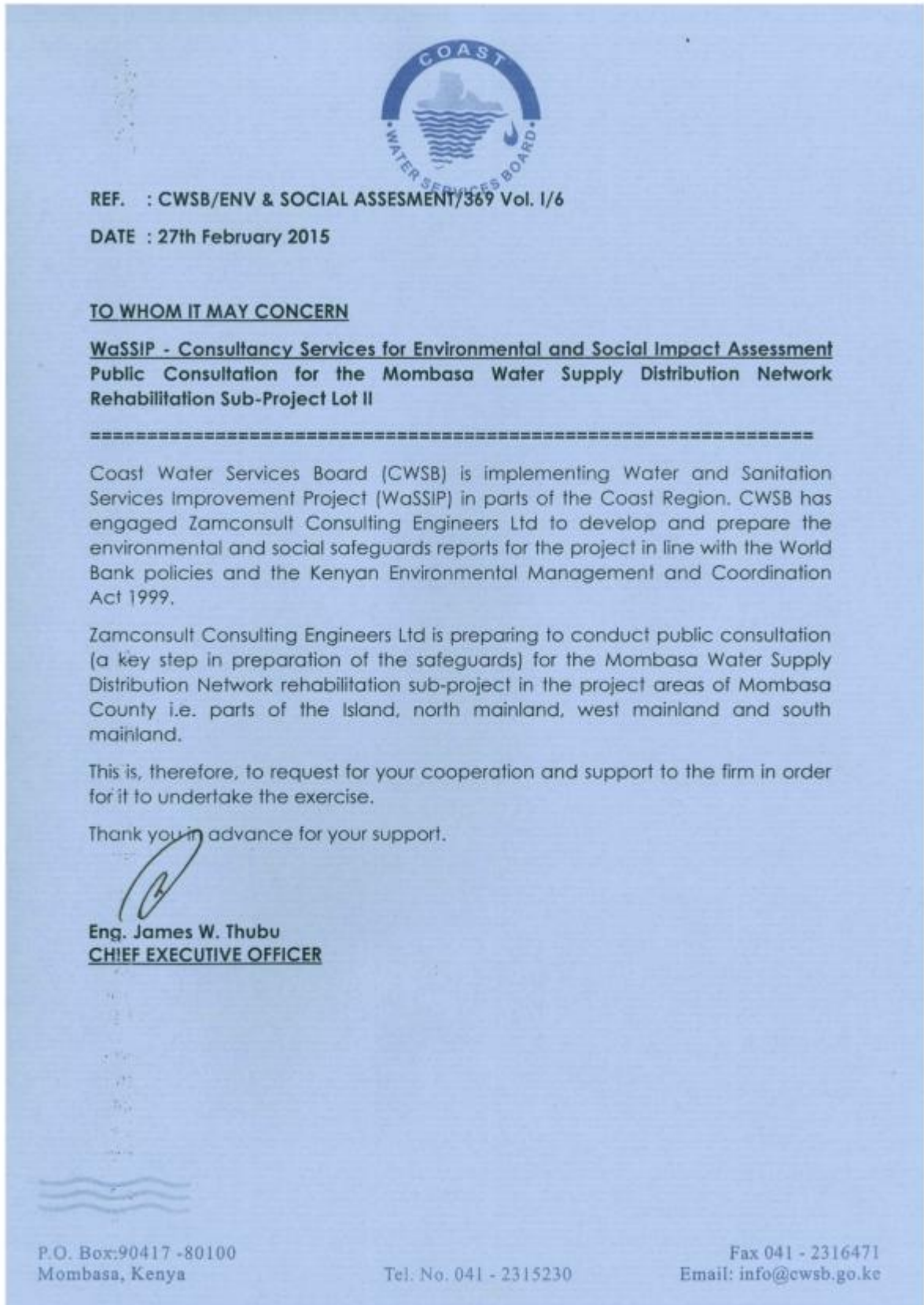
6.3 Who are carrying out these activities?

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

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

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

## 12.2 Appendix B: Letter of Invitation to Public Consultation Meeting



## 12.3 Appendix C Public Participation List of Attendance

### 12.3.1 List of attendance of public participation meeting held on 5th march 2015 at Tudor chief's camp from 9.00 am.

Table 12-1: Attendance List Mombasa Island Public Consultation Meeting

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
SAIDA MBARAK	0670747	0724061295	SPARKI 'B'	TUDOR	TUDOR
SHILLA HASSAN	2258325	0722384345	MAKANDE POSTA	TUDOR	TUDOR
SALIM MTONDOO	20527439	0714438302	BANDARI	TUDOR	TUDOR
FATMA B MOHAMED	10576369	0728959466	NAIROBI AND SHELL	TUDOR	TUDOR
M.HJ KABETABE	5376923	0722881739	TUDOR	TUDOR	TUDOR
MWINYI		0720540292	TUDOR	TUDOR	TUDOR
CLARIS LAJA	13455460	0725960490	CAA-CHONJO	TUDOR	TUDOR
NELSON OKELLO	13775706	0722881689	CAA-CHONJO	TUDOR	TUDOR
REHEME REYAB	9986682	0727110033	MAYENGA SIMBA	TUDOR	TUDOR
JACKSON OMWEBU	6544079	0724275711	MAKANDE POSTA	TUDOR	TUDOR
SALIM BIMATATA	8412362	0729258755	KIZIWI	TUDOR	TUDOR
CATHRINE MOGERE	11294391	0722574775	MAKANDE POSTA	TUDOR	TUDOR
DAVID A MUMURI	0506488	0724016725	MAKANDE	TUDOR	TUDOR
SAID MWAYANA	14436122	0718203829	PARADISE	TUDOR	TUDOR
HENRY K WANYONYI	29479671	0712535500	MOROTO	TUDOR	TUDOR
GABRIEL MWASHIGADI	27541729	070775696	MOROTO	TUDOR	TUDOR
ENG. M.M SABOKE	5812113	0733766141			
HAFIFA MAHLIM ALIO	23826930	0721165148			
DR EDWARD ONTITA	8772970	0715766266			
DR ZABLON OONGE	6412436	0733750231			
PENINAH MWAKA	13732759	0725383228	TUDOR	TUDOR	TUDOR
GEORGE MC MUKEDZANA	3156393	0724675513	TUDOR	TUDOR	TUDOR
DARIUS DZOMBO	9972995	0723694595	TUDOR	TUDOR	TUDOR
ABDALLA J SALIM	4603823	0722802449	TUDOR	TUDOR	TUDOR
JOSEPH OTWENYO	3882173	0728340270	TUDOR	TUDOR	TUDOR
ALEX M LEWA	22250010	0724280597	TUDOR	TUDOR	TUDOR
JUMA BADI	5525651	0729970755			
CATHRINE SALIM KEVOLWE	8378369	0725107166	TUDOR	TUDOR	TUDOR
EARNEST M IBOBO	8388930	0721477675	CAA -CHONJO TUDOR	CAA- CHONJO TUDOR	TUDOR
BENTER ARKIPS	10285824	0726159391	GOROFANI	TUDOR	TUDOR
LINET GWADEYA	20787048	0723-791230	GOROFANI	TUDOR	TUDOR
JANE KINYANJUI	0266437	0729536386	GOROFANI	TUDOR	TUDOR
MORIS AMBAYO OYIER	10547380	0729777595	MSIKITINI	TUDOR	TUDOR

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
FATMA SULEIMAN	8628302	072682152	SPARKY	M(SIMBA)	TUDOR
ALI MASUUD	8388236	0722629039	SPARKY	M(SIMBA)	TUDOR
HENRY OPEM	2245147	0707500560	SPARKY	M(SIMBA)	TUDOR
TILDA NGAO	996375	0724173025	KAA-CHONJO	TUDOR	TUDOR
CRIS O BWIRE	9606381	0724774190	KAA-CHONJO	TUDOR	TUDOR
SIMON MAINA	5774121	0719189138	TUDOR	TUDOR	TUDOR
CHARLES UONDO	9228405	0725770601	GOROFANI-RAILWAYS	TUDOR	TUDOR
SAMUEL OPANDE	13602801	0733475496	SPARK B	TUDOR	TUDOR
ALFAN SAID	9987429	0716802776	KIZIWI	TUDOR	TUDOR
HASSAN H VUGUTO	9771404	0717659851	KIZIWI	TUDOR	TUDOR
MKUBWA LUGOGO	11600946	0727054213	TUDOR	TUDOR	TUDOR
MGANDI MBAO	9771307	0724732589	TUDOR	TUDOR	TUDOR
CHARLES I KARIUKI	3497536	0728787349	MAKANDE	TUDOR	TUDOR
NORMAN MUTISO	9629173	0722274895	TUDOR	TUDOR	TUDOR
KATUNGI LUKISASI	9277292	0716579385	TUDOR	TUDOR	TUDOR
FAITH WANGUI	5383365	0715882677	TUDOR	TUDOR	TUDOR
PETER KOMU	4642452	07029869541	TUDOR	TUDOR	TUDOR
ANJELINA MALOBA	2250166	0728857750	TUDOR	TUDOR	TUDOR
KASSIM MWACHITI	3941187	0721722518	KWA MAKAA	TUDOR	TUDOR
JOSPHAT TAA CHARO	9472489	0723883486	TUDOR KIZIWI	TUDOR	TUDOR
ZAKAYO N MWAMULI	3504119	0720758450	KAA-CHONJO	TUDOR	TUDOR
ABDULLAHI M KARORI	838583	0704274380	JUA KALI	TUDOR	TUDOR
EVANS M MKWELI	11764299	0728769923	KAA -CHONJO TUDOR	TUDOR	TUDOR
VINCENT WAMBUA	8656704	0720897054	MAKANDE POSTA	TUDOR	TUDOR
PHILIP MUTUA	504329	0719415299	KAA -CHONJO TUDOR	TUDOR	TUDOR
AISHA RAJAB	26580780	0717344564	TUDOR	TUDOR	TUDOR
MARION N NYAWERA	22605016	0723268926	TUDOR	TUDOR	TUDOR
JEREMIAH OTIENO	23596773	0734600677	GOROFANI	TUDOR	TUDOR
M BILAL	235169933	0735116730	SPARKY	TUDOR	TUDOR
ABDALLA A ALI	8453957	0720312018	M/SIMBA	TUDOR	TUDOR
NAIMA MWALIMU	9966938	0727631221	M/SIMBA	TUDOR	TUDOR
BIAMA YUSUF	11876725	0723146066	M/SIMBA	TUDOR	TUDOR
ZAINAB KHAMIS	8471303	0729604872	M/SIMBA	TUDOR	TUDOR
PHILLEMONT MWAMBURI	0321654	0722668609	SPARKY	TUDOR	TUDOR
PRICILLA D MWAKITE	27000185	0716637058	JUA KALI	TUDOR	TUDOR
ZAADIYA MOHAMED	0307426	0723923210	JUA KALI	TUDOR	TUDOR
ASIA M KALE	12770731	0712948208	SPARKY	TUDOR	TUDOR

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
TSUMA KOMBO MANGALE	13281730	0711770277	MAKAA-STAGE	TUDOR	TUDOR
REGINA MBITHE	22667459	0710395307	JUA KALI	TUDOR	TUDOR
TAPITHA MUSYOKA	9582634	0708510249	SPARKY	TUDOR	TUDOR
MAPENZI WAMBUA	2264965	0725677604	JUA KALI	TUDOR	TUDOR
DISHAN FAZAN	0747727	0712419572	JUA KALI	TUDOR	TUDOR
JOHNSTONE OMEDI	21987523	0713743114	TUDOR	TUDOR	TUDOR
JAMILA SHABAN	12489913	0722800716	TUDOR	TUDOR	TUDOR
MARGARET R MASUMBUKO	9960048	0726122096	TUDOR	TUDOR	TUDOR
SALAMA MOHAMED	8469448	0726605828	SPARKI	TUDOR	TUDOR
JOB MBITI	16004139	0733551639	MAKAANI	TUDOR	TUDOR
LILIAN AKINYI	10959307	0722397667	KAACHONJO	TUDOR	TUDOR
SOLOMON KABARE	25124936	0729410021	NYAYO ESTATE	TUDOR	TUDOR
ZUMA MANGALE	0748734	0710963985	TUDOR	TUDOR	TUDOR
SERAH NDUNGE NZIVU	13616756	0715813994	JUA KALI	TUDOR	TUDOR
ZAKIA ABDALLA	542906	0722541520	MAKANDE POSTA	TUDOR	TUDOR
MWAVITA DZUWAMWENGA	24135113	0718141600	BANDARINI	TUDOR	TUDOR
ALI ABDALLAH CHAPU	29102020	0701808572	BANDARI	TUDOR	TUDOR
ABDURKADIR RASHID	5463756	0721498854	BANDARI	TUDOR	TUDOR
AMINA KIEMA	6728231	072268 1158	KIZIWI	TUDOR	TUDOR
ROSE ZIGHE	22534700	0725612346	TUDOR	TUDOR	TUDOR
NASTRON MUTISYA	1169383	0722870333	JUA KALI	TUDOR	TUDOR
CHARITY M NYAGA	1404522	0723510826	JUA KALI	TUDOR	TUDOR
MONICA K MARUTE	7721435	0713145817	TUDOR	TUDOR	TUDOR
SAUM DZAME KOMBO	27325016	0717293443	TUDOR	TUDOR	TUDOR
MBITA WILLIAM	13417703	0733486324	PARADISE	TUDOR	TUDOR
WILLIAM BILA AKATU	0309492	0722870561	TELEPOSTA	TUDOR	TUDOR
MAXWELL ODADA	5375525	0722330336	TUDOR	TUDOR	TUDOR
SALIM MWANGATA	5380103	0725858981	TUDOR	TUDOR	TUDOR
MICHAEL WANYONYI	7264264	0723612520	KAACHONJO	TUDOR	TUDOR
NYAMU SK	5016880	0725403375	SENIOR.ASS.CHIEF		TUDOR
PASTOR MAXWELL ODADA	5375525	0722330336	TELEPOSTA	TUDAR	TUDAR
MOHAMED NGALA	14624777	0720092568	TUDOR	TUDOR	TUDOR
JUMA NYAMANI	11600918	0717181025		TUDOR	TUDOR



Scanned Images of Public Participation Attendance List in Tudor Location

**MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST**

NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
1 SAIDA MBARAK	0670747	0724061295	SPARKI 'B'	TUDOR	TUDOR
2 SHILLA HASSAN	2258325	0722384345	MAKANDE POSTA	TUDOR	TUDOR
3 SALIM MIONDO	20527439	0714488300	BANDARINI	"	"
4 FATMA B. MOHAMMED	10576369	0728959466	NABIRI SHELLE	TUDOR	TUDOR
5 M.H. KABEMBE	5376923	0722881799	Todor	"	"
6 Abdoul M WIMBYI		0720540292	MW	TUDOR	<del>TUDOR</del>
7 CLARIS LAJA	13455460	0725960490	KAA-CHONJO	TUDOR	Alino TUDOR
8 NELSON OKELO	13775706	07228881689	KAA CHONJO	TUDOR	TUDOR <del>APPROX</del>
9 Rehana Rayob	9986682	0727110033	Moyenge SIMBA	TUDOR	TUDOR
10 JACKSON CMWBRU	6544079	0724225771	MAKANDI POSTA	TUDOR	TUDOR <del>THU</del>
11 SALIM B. MATATA	8412362	0729258755	KIZIWI	TUDOR	TUDOR
12 CATHERINE MOGEE	11294391	0722574720	MAKANDE POSTA	TUDOR	TUDOR (all)
13 DAVID A. MUNIB	0506448	0724016105	makande	TUDOR	TUDOR
14 SAIB MWAYAMA	14436122	0718203829	PARADISE	TUDOR	TUDOR
15 HENRY K. WANYONYI	29479671	0712535500	MOROIO	TUDOR	TUDOR
16 GABRIEL MWASHIGADI	27541729	0707075696	MOROIO	TUDOR	TUDOR
17 ENG. M. M. SARKI	5812113	0723766141			
18 Hafsa MANKIM ANTO	23826930	0721165148			<del>THU</del>
19 Dr Edward Dntita	8772970	0715-766266			<del>THU</del>
20 Dr. Zablon Ouge	6412436	0733750231			<del>THU</del>

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**MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST**

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
1	Peninah Mwaka	13732759	0725383228	Tudor	Tudor	Tudor.
2	George Mc Mukebama	3156393	0724675513	"	"	"
3	DARUS DZOMBO	9972995	0723695595	TUDOR	TUDOR	TUDOR
4	Abdalla J. Sam	4603823	0722802449	TUDOR	"	"
5	JOSEPH OTWENYO	3882173	0728340270	TUDOR	TUDOR	"
6	ALEX. M. LEWA	2250010	0724280597	TUDOR	TUDOR	TUDOR
7	JUMA BADI	5525551	0729970785	-	-	-
8	CATHRINE SAUMU KEVOLWE	8378369	0725107166	<sup>SPAKI</sup> Tudor	Tudor	Tudor
9	Samost M. Bobo	8388930	0721477675	<sup>KACHONJO</sup> Tudor	<sup>KACHONJO</sup> Tudor	Tudor
10	BENTER ARKIPS	10285824	0726159891	Gorofani	Tudor	Tudor
11	LINET GWADEYA	20787048	0723791230	GOROFANI	TUDOR	TUDOR.
12	JANE KINYAMJUI	0266437	0729536386	GOROFANI	TUDOR	TUDOR.
13	MORIS AMBAYO OYIER	10547380	0729777595	<sup>MSIKITINI</sup> TUDOR	TUDOR	TUDOR
14	FAIMA Suleman	8628302	0722682152	SPARKY	M (SIMBA)	TUDOR
15	Ali MASHUD	8388236	07226989	SPARKY	M (SIMBA)	TUDOR
16	HENRY OPEM	2245147	0707500561	SPARKY	M (SIMBA)	TUDOR
17	TILDA NGAO	996375	0724173025	KACHONJO	TUDOR	TUDOR.
18	CRIS O. BURKE	9606371	0724774190	KACHONJO	TUDOR	TUDOR
19	SIMON MAINA	3774121	0719189138	TUDOR	TUDOR	TUDOR
20	CHARLES Omba	9228405	0725470661	GOROFAN DARWAS	"	"

(2)

**MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST**

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
1	SAMUEL OPANDE	13602807	0733 475496	SPARK B	TUDOR	TUDOR
2	ALFAN SADI	9987429	0716802776	KIZIWI	TUDOR	TUDOR
3	HASSAN H. YUSUFO	9771404	0717659881	KIZIWI	TUDOR	TUDOR
4	MKUBWA LUGOGO	11600948	0727054273	TUDOR	TUDOR	TUDOR
5	MGANDI MBAO	9771307	0124732589	TUDOR	TUDOR	TUDOR
6	CHARLES I. KARIUKI	3497536	0728787349	MAKANDE	TUDOR	TUDOR
7	NORMAN MUTISO	9629173	0722274895	TUDOR	TUDOR	TUDOR
8	KATIUNGU LUKISASI	0716579385	4277292	TUDOR	TUDOR	TUDOR
9	Faith Wengui	5383365	0715882677	TUDOR	TUDOR	TUDOR
10	PETER KOMU	4242452	0702988161	TUDOR	TUDOR	TUDOR
11	ANJELINA MALOBA	9250166	0728857750	TUDOR	TUDOR	TUDOR
12	KASSIM MWACHILI	394187	072172518	KWA MKAHA	"	"
13	Josphat TAA CHARO	9472489	0723883484	TUDOR KIZIWI	TUDOR	TUDOR
14	ZAKAYO N. MWAMULI	3504119	0720758450	KAA-JONJO	TUDOR	TUDOR
15	ABDULLAH M. KADORI	822582	070422280	TVA KALI	TUDOR	TUDOR
16	EVANS M. MKWELI	11764299	0728769923	KAA CHONJO	TUDOR	TUDOR
17	VINCENT WAMBUN	8656704	0720897056	MAKANDE POSTA	TUDOR	TUDOR
18	Philip Mutua	524329	0719415299	KAA CHONJO	TUDOR	TUDOR
19	ATSHA RAJAB	26580780	0717344564	TUDOR	TUDOR	TUDOR
20	MARION N. NYAWERA	22605016	0723268926	TUDOR	TUDOR	TUDOR

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**MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST**

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
1	JEREMIAH OTIENO	23596773	0734600677	GIOROFANI	TUDOR	TUDOR
2	M. BILAL	235169933	0735116730	SPAKI	"	"
3	ABDULLAH A BHI	8453957	0720 30208	m/simba	"	"
4	NAMA MWATIMU	9966938	0727 631221	m/simba	"	"
5	Bisma Yusuf	11876725	0723146066	m/simba	"	"
6	ZAHARA KIMMIS	8471303	0729 004872	m/simba	"	"
7	PHILIP MWAIBARI	0321654	0722 668609	SPAKI	TUDOR	"
8	PRICILLAD MWAKITEG	27000185	0716637058	JUA-KALI	TUDOR	"
9	SAADIYA MOHAMED	0307426	0723923210	JUA-KALI	TUDOR	"
10	ASIA. M. KALE	12770731	0712948208	SPAKI	TUDOR	TUDOR
11	ISUMA (KIMBO) MANGALE	13281730	0711770277	MAKAA-STAGE	TUDOR	TUDOR
12	REGINA MBITHI	22667459	0710395307	JUA-KALI	TUDOR	TUDOR
13	TAPIHA MUSTOICA	9582634	0708510249	JUA-KALI	TUDOR	TUDOR
14	MIPENZI WAMIBWA	2264965	0725677604	TUDOR	TUDOR	TUDOR
15	DISHAN FAZAN	0747727	0712419572	TUDOR	TUDOR	TUDOR
16	JOHNSTONE OMSI	21987523	0713743114	TUDOR	TUDOR	TUDOR
17	JAMILA SHABAN	12489913	0722800714	TUDOR	TUDOR	TUDOR
18	MARGARET E. MASHUMBUKO	9960068	0726122096	TUDOR	TUDOR	TUDOR
19	SALAMA MOHAMED	8469448	0726605828	SPAKI	TUDOR	TUDOR
20	JOB MBITI	16004139	073351659	MAAKANI	TUDOR	TUDOR

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**MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST**

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
1	Lilian Akinyi	10959307	0722397669	Kaa, Choujo	Tudor	Tudor
2	SOLOMON KABARE	25124936	0729410021	NYAYO ESTATE	Tudor	Tudor
3	Zuma Mangale	0748734	0710963965	Tuda	Tuda	-
4	SERAH NAUNGE Nduru	93616756	0715813994	JUA KALI	TUDOR	8 TUDOR
5	Zakia Abdalla	542906	0722841520	Nakande Post	TUDOR	TUDOR -
6	MWAVITA Dzuamwenya	24135113	0718141600	BANDARINI	TUDOR	TUDOR
7	ALI ABDALLAH CHAPI	29102020	0701808572	BANDARINI	TUDOR	TUDOR
8	ABDULKARIM RASHID	5463755	0721498852	KIZIWI	TUDOR	TUDOR
9	AMINA KIEMA	4728231	0722681158	TUDOR		
10	ROSE ZIGHE	22534700	0725612346	JUA KALI	TUDOR	TUDOR
11	NASTROM MUTISYA	1169382	0722870333	JUA KALI	TUDOR	TUDOR
12	CHARITY M. NYAGA	1404522	0723510526	TUDOR	TUDOR	TUDOR
13	MONICA K. MARISE	7721435	0713145817	TUDOR		
14	SAUM DRAME KOMB+	22325016	0717293443	PARADISE		
15	MRS JO WILLIAM	13417703	0733686324	TUDOR	TUDOR	TUDOR
16	William-Bira AKATI	0309492	0722870561	TUDOR	TUDOR	TUDOR
17	MAXWELL ODADA	5375525	0722330556	TELEPOSTA	TUDOR	TUDOR
18	SALIM MWANGATA	5380103	0725858981	TUDOR estate	TUDOR	TUDOR
19	Michael Mwanjany	7264264	0723612520	Kasachonyi	Tudor	Tudor
20	NYAMU SK	5016880	0725403323	SNR. ASS	CHIEF	TUDOR

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**MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST**

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
1	St Maxwell Odeda	5375525	0722330336	TELEPOSTA	TUDOR	TUDOR
2	MAMPHIRO NGALA	1152677	0720092568	TUDOR	TUDOR	TUDOR
3	SUMA NYAMANI	11600918	0717181025		TUDOR	TUDOR
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**12.3.2 List of attendance of public participation meeting held on 5th march 2015 at St. Mary's catholic hall in Changamwe from 2.30pm.**

**Table 12-2: Attendance list West Mainland Public Consultation Meeting**

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
NGAODEFIA OMUGA OCHIENG	0660413	0715462031	BANGLADESH		
EMELDA KAYASI	7095760	0724825372	KWAPUNDA	BIRIKANI	MIKINDANI
NYAMVUKA KOKOI MAMA	5425840		KWAPUNDA	BIRIKANI	MIKINDANI
JUMWA KATANA CHARO	3907710		KWAPUNDA	BIRIKANI	MIKINDANI
EVALINE AUMA	627541	0702166427	KWAPUNDA	BIRIKANI	MIKINDANI
SICKALI WAKESHO	31052550	0708609082	KWAPUNDA	BIRIKANI	MIKINDANI
FATUMA MKUZI			KWAPUNDA	BIRIKANI	MIKINDANI
CHARLES MWAKIO	2252391	0725567802	CHAANI	CHAANI	CHAANI
MWENDE MUTUA	10879491	0720310662	MIKINDANI	CHAANI	CHAANI
VERONICAH MWETU	4640992	0704747799	PORTREIZ	PORTREIZ	PORTREIZ
ESTHER M MWENJE	5476665	0729283427	PORTREIZ	PORTREIZ	PORTREIZ
GABRIEL AMOK	22785624	0716047035	WAYANI	PORTREIZ	PORTREIZ
JANE MWAWUGHANGA	132368713	0714264255	MATHARE	CHAANI	CHAANI
MARY MBULO	8372110	0722838724	PORTREIZ		PORTREIZ
FESTUS KIRIGHA	25219790	0719851643	HAMISI	HAMISI	CHANGAMWE
LUCRENCIA MBASHU	5402770		HAMISI	HAMISI	CHANGAMWE
DONALD MZEE	24260149	0700348223	HAMISI	HAMISI	CHANGAMWE
HUSSEIN RAMADHAN	3683461	0723845298	HAMISI	HAMISI	CHANGAMWE
JULIUS MUTUA	21876394	0727500610	HAMISI	HAMISI	CHANGAMWE
MARY TOM	10322782	0717929183	BIRIKANI	BIRIKANI	MIKINDANI
JACKLINE AKOTH	29038928	0727125079	KWAPUNDA	BIRIKANI	MIKINDANI
SULEIMAN BAKARI	2253578	0736025428	MIKAIZINI	KASARANI	CHAANI
CLEOPHAS ALUKA	26515323	0711793735		PORTREIZ	PORTREIZ
DAVID MBOGHO	0118568	0710187519	NHC ESTATE	CHANGAMWE	CHANGAMWE
POPO MBARUKU	3881051	0707305424	MWAGOSI	PORTREIZ	PORTREIZ
MISHI MBENGE	3153136	0720964471	BOKOLE	PORTREIZ	PORTREIZ
BERNARD MKUNGO	0655812	072277554	HAMISI	CHANGAMWE	CHANGAMWE
CHARLES OLIVIAH	9919709	0721960008	BOKOLE	PORTREIZ	PORTREIZ
CHRISTOPHER MWADIME	22652075	0714053643	HAMISI	CHANGAMWE	CHANGAMWE
IBRAHIM RASI	23416332	0708180005	KWA RASI	CHAANI	CHANGAMWE
BENEDETE KAKUVI		0712969500	KWA RASI	CHANGAMWE	CHANGAMWE
DAMARIS WALEGHA	10394978	0729325289	BANGLADESH	BIRIKANI	MIKINDANI
SAMUEL ANANGO	6297512	0727126629	BIRIKANI	BIRIKANI	MIKINDANI
JANE MWIKYA	5062484	0724126624	MIGADINI	MIGADINI	CHAANI
JUDY MWANIRIRI	2037264	0720395157	CHANGAMWE		HAMISI
FREDRICK BWIRE	20682554	07221637690	CHANGAMWE	BANGLA	CHANGAMWE
MARIAM MOHAMED	4654435	0722648929	MIKINDANI	PLAZA	
NYAMVULA LENGA	1168602	0733773124	PORTREIZ	KWA HOLA	PORTREIZ
MARY WERE	23257941	0721919572	VITEWA	CHAANI	CHAANI
FRANCIS NYANJE	3162817	0723769987	KALOLENI VILLAGE	CHAANI	CHAANI

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
IMA MATANO MZEE	4660679	0734756181	CHIEF	BIRIKANI	MIKINDANI
DOGO PETER		0739484861	DARAJANI	BIRIKANI	MIKINDANI
HAFIFA MAALIM	23826930	0721165148	CWSB		
DR ZABLON OONGE	6412436	0733750231			
ENG.MESHACK SABOKE	5812113	0733706141			
DR EDWARD ONTITA	8772970	0715766266			
ANJELINE KILOLA	30070639	0711882135	KWA RASI	CHAANI	CHAANI
EVERLYNE AKETCH	13372389	0716049862	KWA PUNDA	BIRIKANI	
JONATHAN MULWA	7417590	0712274810	M.NOOR	M.NOOR	CHAANI
JANET HERENIA	0451957	0704708888	BAHATI	BIRIKANI	MIKINDANI
PETER OWINO	20743867	0712420956	M.NOOR	CHANGAMWE	CHANGAMWE
ABDALA KONDO	5433254	0714990179	MUCHELENI	CHANGAMWE	
SETH MAKAU	3155572	0723274181	HAMISI	CHANGAMWE	
AMBROSE CHUMBA			KWAHOLA	CHANGAMWE	
FOBICK OTIENO	5083225	0727414359	MINGADINI		
EDWARD K SAKWA	29809873	0724977992	KWA SOUDI	CHANGAMWE	
AMIHA MUSA	13205468	0706331568	MIGADINI	CHANGAMWE	
MARY WAMBUI	23109001	0723271662	APOLLO	CHANGAMWE	
ESTHER KOMBO	26233553	0716355533	BOKOLE	PORTREIZ	
LILIAN AMUOCK	27772516	0712045557	WAYANI	PORTREIZ	PORTREIZ
HAMISI OMARI MBUTA	8375512	0714832425	BOMU	PORT REITZ	PORT REITZ
BANTA ODUOR	20062145	0712710325	SOWETO	CHAANI	CHAANI
JOSEPH WERE	11871622	0712969510	CHANGAMWE	CHAANI	CHAANI
FRANCIS KISEU	33236557	0722277553	CHANGAMWE	CHAANI	CHANGAMWE
SYLVIA OSODO	3881067	0720359359	BANGLADESH	BIRIKANI	MIKINDANI
PHOEBE MBINJI	6265072	0714444837	BANGLADESH	JOMVU	MIKINDANI
JEREMIAH KINYONYEI	11408360	0721845201	BOKOLE	PORT REITZ	PORT REITZ
PANCRAS K. MBASHU	26325220	0728884013	BARAKA BOKOLE	PORT REITZ	PORT REITZ
CAROLYINE A. AMOLO	13811636	0721778092	DARAJANI	BIRIKANI	MIKINDANI
BENSON MGANGA	13824823	0734796142	WAYANI	PORT REITZ	PORT REITZ
PETER MARTIN JUMA	8579118	0725993173	WAYANI	PORT REITZ	MAGONGO
CHRISTOPHER O. OTIKI	9259659	0722581633	CHANGAMWE	CHANGAMWE	CHANGAMWE
GEORGE ODUOR	0509135	0735545337	CHANGAMWE	CHANGAMWE	CHANGAMWE
JACINTA KIRUKU	1164151	0723757379	BOMU	PORT REITZ	CHANGAMWE
ELIZABETH T. SAIDI		0700462809	BIRIKANI	JOMVU	
REHEMA RAKII	8389020	0720201031	BIRIKANI	JOMVU	
JUMA OMARI	26023088	0728076360	BOKOLE	PORT REITZ	PORT REITZ
RAJAM SAIMON	25792161	0721523676	BOKOLE	PORT REITZ	PORT REITZ
JOSEPH TITO OSOBURO	8077885	0722697540	BOKOLE	PORT REITZ	PORT REITZ
SAMSON MUSYOKA	12585487	0724494730	BOMU	CHANGAMWE	CHANGAMWE
MARIANA MESI	0672409	0721436875	WAYANI	PORT REITZ	CHANGAMWE
FLORENCE WANJIRU	0671774	0715615568	BOKOLE	PORT REITZ	PORT REITZ
PHILOMENA MUNYOKI	11276693	0713009148	MWAGOSI	BIRIKANI	CHANGAMWE
JOSHUA AMATANDE	21731040	0725605133	MKUPE	BOMU	CHANGAMWE



<b>NAME</b>	<b>ID NUMBER</b>	<b>PHONE NUMBER</b>	<b>VILLAGE</b>	<b>SUB-LOCATION</b>	<b>LOCATION</b>
MARY RAMTU	16052374	0726876074	BOMU	CHANGAMWE	CHANGAMWE
TATU MWANGI	0508384	0720687414	HAMIJI	CHANGAMWE	TATU
BAKARI MUHAMMED	24623379	0722616069	CHANGAMWE	PORT REITZ	PORT REITZ
GRACE KABWERE	12623857	0715412237	MIGADINI	PORT REITZ	PORT REITZ
STEPHEN BWIKA	10879000	0725071448	M/NOON-RAILWAYS	CHANGAMWE	CHANGAMWE
JOHN NGUTHU	14698476	0721680268	RAILWAYS	CHANGAMWE	CHANGAMWE
MARTIN MWITHIKA	8370496	0700857869	MWAGOSI	CHANGAMWE	CHANGAMWE
EKASTUS MATARI	25108141	0720027314	MBUYUNI	CHAANI	CHAANI
MARGARET NYANGASI	9775977	0710986089	KIBARANI	BIRIKANI	BOGOBOGO
ODIPO MARK	9988966	0733746617	CHANGAMWE	CHANGAMWE	CHANGAMWE
EVANS RAJUN	12517016	0728732840	CHANGAMWE	CHANGAMWE	CHANGAMWE
CARLOS OCHIENG	21885912	0726691009	CHANGAMWE	CHANGAMWE	CHANGAMWE
HUDSON B OLOO	21939905	0722318958	CHANGAMWE	CHANGAMWE	CHANGAMWE
JOHN ANDAKASIA	2244006	0720856957	CHANGAMWE	N.H.C	CHANGAMWE
COLLINS AZUNA	11585865	0722843868	CHANGAMWE	N.H.C	CHANGAMWE

Scanned Images of Public Participation Attendance List in St. Mary's Catholic Church Hall Changamwe

WEST MAINLAND - ST. MARY'S CATHOLIC HALL, CHANGAMWE

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1 NGAODEFIA DMOGA OCHIENT	0660413	0715462031	Bangladesh			
2 EMEIDA KATASI	7095760	0724825772	Kwapunda	Birikani	Birikani Mikindani	
3 NYAMVUA KEOI NAMA	5425840	N/A	"	"	"	
4 JUMWA KATANA CHARO	3907710	N/A	"	"	"	
5 EVALINE ADMA	627541	0702166427	"	"	"	
6 SICKILI WAKESHO	31052550	0709609082	Kwapunda	"	"	
7 FATUMA MKUZI	-	-	"	"	"	
8 CHARLES MWAKIO	2252391	0725567802	CHAANI	CHAANI	CHAANI	
9 MWENGE MUTUA	10879491	0720310662	Mikindani	"	"	
10 Veronica Mwakio	4640992	0704747299	Mikindani			
11 Esther M. Nwemjo	0476661	0729783172	Portvize	Lihongi	Portvize	
12 Gabriel Mwakio	227862x	0720283227	P. REIZ	P. REIZ	P. REIZ	
13 JANE Mwakio Mungu	13208713	0716047035	WAYANI	PORTREITZ	PORTREITZ	
14 MARY MBULO	8372110	0714264255	WAJANI	PORTREITZ	PORTREITZ	
15 FESTUS KIRISHA	25219990	0722838724	MATHIFE CHAANI	CHAANI	CHAANI	
16 LUCRENCIA MBASHU	5402770	0719851643	PORTREITZ		PORTREITZ	Mb
17 DONALD MACE	24260149	0700348223	HAMISI	HAMISI	CHANGAMWE	
18 Hussain Ramadhani	13683461	0723045299	HAMISI	"	CHANGAMWE	A
19 JONUS MUTUA	21876394	0727500610	HAMISI	"	CHANGAMWE	
20 MARY TOM	10322782	07792983	BIRIKANI	BIRIKANI	MIKINDANI	Tom

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WEST MAINLAND - ST. MARY'S CATHOLIC HALL CHANGAMWE

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	STN
1	JACKLINE AKOJI	29038928	0727125074	Kwipunda	BIRIKANI	MIKINDANI	
2	SULEIMAN BAKARI	2253579	0736025428	MAKAZIWI	KASARANI	CHAANI	
3	CLEOPHAS AICHA	26515323	0711753733	WATANI	PORTAITZ	PORTAITZ	
4	David Mboyo	0118568	0710187579	NHC ESTATE	CHANGAMWE	CHANGAMWE	
5	POPO Mbaruku	3981051	072730584	Kwagosi	Portreize	Portreize	
6	MISHI MBENGE	3153136	072096447	BOKOLE	PORTREITZ	PORTREITZ	
7	BERNARD MKUNGO	0655812	072227534	Hamisi	Changamwe	Changamwe	
8	CHARLES OLIVIAH	9919709	0721960008	BOKOLE	PORTREITZ	PORTREITZ	12/3
9	CHRISTOPHER MWADIME	22652075	0714053643	Hamisi	CHANGAMWE	CHANGAMWE	12/3
10	Ibrahim Rasi	23416332	0708160005	Kwa Rasi	Chaani	Changamwe	12/3
11	Boneta Karami	1177678	071296500	Khamisi	Changamwe	Changamwe	J
12	SAMARIS WARECHWA	10391978	072932528	BANIGALADESH	BIRIKANI	MIKINDANI	12/3
13	Samuel Anago	6297512	0727126624	Birikani	"	"	12/3
14	JANE MUKIA	5062484	0724094118	Migadiini	Migadiini	Chaani	12/3
15	JUBA Mwaniriri	2037264	0720399057	Changamwe	"	Hamisi	12/3
16	Fredrick Bwira	2668254	0721637696	Changamwe	Baigla	Changamwe	
17	MARIAM MOHAMED	4654435	0722648929	MIKINDANI	PLAZA	12/3	
18	Nyamula Kenya	1168602	0733773124	Portreitz	Kwahela	Portreitz	12/3
19	MARY WERE	2325794	0721919572	VITENJA	CHAANI	CHAANI	12/3
20	FRANCIS NYANJE	3162817	0723769987	Kakoleni Village	CHAANI	CHAANI	12/3

(2)

WEST MAINLAND - ST. MARIU CATHOLIC HALL CHANGAMWE

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1 IMA MATANO Mzee	4660679	0784756181	CHIEF	BIRIKANI	MIKINDANI	[Signature]
2 LOGO PETER		0739484861	DARAJANI	BIRIKANI	---	[Signature]
3 HAFIYA MARIAM	23826930	0721165148	court water services bank			[Signature]
4 Dr. Zablon Ouge	6412436	0733750231	-	-		[Signature]
5 Dr Edward Ontiza	8772970	0715766266	-	-		[Signature]
6 ENG. MESIADE SIBEKE	5812113	0733706141	-	-		[Signature]
7 ANGELINE KILOLA	30070629	0711882135	Kwa Basi	Changi	AK-Changi	[Signature]
8 EVERLINE AKICH	13372389	0716049862	Kwa Punda	Birirani	Everline	[Signature]
9 Jonathan Mulu	7417590	0712274810	M. Noor	M. Noor	Changi	[Signature]
10 JONET HERENIA	0451957	0704705888	BAHATI	BIRIKANI	Mikindani	[Signature]
11 Peter Owino	20743557	0112920952	M. NOOR	Changamwe	Changamwe	[Signature]
12 ABDRAH MONDO	5433250	0714990179	Muchelele	Changamwe	---	[Signature]
13 SETH MUKAI	3153372	0723274115	HAMISI	Changamwe	Ball	[Signature]
14 Ammanuel chumbao	02185277	0582140	Kwashiha	Changamwe	---	[Signature]
15 FOBICK OIENO	5083225	0727414557	Mungudi	Ch	---	[Signature]
16 EDWARD K. SAKWA	29809873	0724977972	Kwa Saidi	CHANGAMWE	---	[Signature]
17 AMINIA MUSA	12205460	0706331088	Migadina	"	---	[Signature]
18 MARY WAMBUI	23109001	0723271662	APollo	Changamwe	---	[Signature]
19 ESTHER KOMBO	26233553	0716255533	BKALE-BARAKA	PORTREITZ	PORTREITZ	[Signature]
20 LILIAN ARUOKI	27772516	0712045557	WATANI	PORTREITZ	PORTREITZ	[Signature]

3

WEST MAINLAND - ST. MART'S CATHOLIC HALL, CHANGAMWE

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1 Hamis, Omeri ALIWA	4375572	0714832425	Bomu	Portreitz	Portreitz	
2 Peter Oduor	20062145	0712710325	Soweto	Chaañi	Chaañi	
3 JOSEPH Wae	11871622	072962510	Changwe	Changwe	Changwe	J.
4 FRANCIS KISEU	3323657	072227358	CHANGAMWE	"	CHANGAMWE	Bob
5 SILVIA OSODO	3881067	072035959	BANGLADESH	BIRIKANI	MIKINDANI	Shy
6 Phoebe Mbingi	6265072	071444437	Bangladeshi	Tomu	Mikindani	Phoebe
7 Jeremiah Kinganyi	11408360	0701545201	Bokole	Portreitz	Portreitz	Shy
8 PANCAS K. NIBASHI	26325220	0728894013	BARAKA BUQUE	PORTREITZ	PORTREITZ	Shy
9 CAROLINE A. AMOLO	13811636	0721778092	DARAJANI	BIRIKANI	MIKINDANI	Bob
10 Rensia Mfanga	13824823	0734796142	WAYANI	PORTREITZ	PORTREITZ	Ky
11 Peter Mwangi	8579118	0725498173	Wayani	Portreitz	Mogogoo	
12 CHRISTOPHER D. OTIKO	9259659	0722-581633	CHANGAMWE	CHANGAMWE	CHANGAMWE	Shy
13 GEORGE ODUOR	0509135	0735525337	CITANGAMWE	CHANGAMWE	CHANGAMWE	Shy
14 Jacinta KARUKU	1164151	0725757379	Bomu	Portreitz	CHANGAMWE	Shy
15 ELIZABETH T. SAIDI		0700462809	BIRIKANI	Tomu		Shy
16 RHEMMA KARUKU	8789220	0720206231	BIRIKANI	Tomu		Shy
17 Suma ANANI	26023088	0728046560	Bokole	PORTREITZ	PORTREITZ	Shy
18 RAJAR SALMAN	23792161	0721523670	BOKOLE	PORTREITZ	PORTREITZ	Shy
19 JOSEPH T. OSOBOZO	8077885	0722697540	Bomu	PORTREITZ	PORTREITZ	Shy
20 SAMSON MUSHOKA	12585487	0724494330	WAYANI	CHANGAMWE	Changwe	

(4)

WEST MAINLAND - ST. MARTY'S CATHOLIC HALL, CHANGAMWE

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	INITIALS
1 MARIANA MASI	0672409	0721438875	BOKOLA	Portritiz	Changamwe	
2 FLORENCE E. WANJIKU	0691774	0715615568	MWAGOSI	PORTRITIZ	PORTRITIZ	
3 PHILomena Mung'oki	11276693	0713009148	MVUPE	BIRIKANI	Changamwe	
4 Joshua Amakanda	21231040	092560983	BOMU	Bomu	Changamwe	
5 Mary Rantu	16052374	0726876094	Hamiji	Chama	11	
6 Tatu Mwanji	0508984	0720687414	Changamwe	Changamwe	Tatu	
7 BAKAR, MOHAMED	20623379	0722616069	MIGADINI	PORTRITIZ	11	
8 GRACE KABUKWE	12623857	071541280	PORTRIZ	"	Portritiz	
9 STEPHEN MBWILKA	10879000	0725-071409	MWANGI-Railway	CHANGAMWE	CHANGAMWE	
10 JOHN NGUTHU	14698476	0721600208	RAILWAY	CHANGAMWE	CHANGAMWE	
11 MURIN MUKITHIGA	8370496	0700857869	MWANGI	CHANGAMWE	CHANGAMWE	
12 ERASTUS MATARI	2510 KINI	0720027314	MWYUNI	CHANI	CHANI	
13 MARGARET MYANGSI	977577	0710936087	KIRANI	BIRIKANI	BOGOGO	
14 JDLPO MARIC	9988966	073374667	CHANGAMWE	CHANGAMWE	CHANGAMWE	
15 Evans Rajun	12577016	072832880	"	"	"	
16 CARLOS OCHIENG	21885912	0726651009	"	"	"	
17 HUDSON B. OLOO	21939905	0722318958	"	"	"	
18 JOHN ANDALUSIA	2244006	0720356957	"	N.H.C	CHANGAMWE	
19 Cedrick Azuma	11585865	072284388	"	N.H.C	Changamwe	
20						

(5)

**12.3.3 List of attendance of public participation meeting held on 6th march 2015 at Frere town CDF hall in Kisauni from 9.50am.**

**Table 12-3: Attendance List North Mainland Public Consultation Meeting**

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
JULIUS K SIRYA	13375083	0723178712	BOMBOLULU	KISAUNI	KISAUNI
PATRICK S RUWA	13376271	0710270307	NGUU TATU	KISAUNI	BAMBURI
CHIKWANGU KATANA	12843385	0723454252	DIGIRIKANI	MWAKIRUNGE	BAMBURI
JAMES HIRO NGALA	5474120	0727983322	BARISHEBA	FRERETOWN	KISAUNI
AMINA TUNU NGOBABU	5472466	0700345090	KACHORORONI	JUNDA	KISAUNI
BWANA NZORI	0659560	0733709395	MGONGENI	FRERETOWN	KISAUNI
MARY WANJIRU	22314591	0728954519	VIKWATANI	JUNDA	KISAUNI
HAMISI HINZANO	20327237	0706779367	VIKWATANI	JUNDA	KISAUNI
RIZIKI KANGA	28944107	0764580508	VIKWATANI	JUNDA	KISAUNI
JUDITH WAWUDA MWAYHUDA	13710082	0700450849	VIKWATANI	JUNDA	KISAUNI
PETERSON MUTOOTA	5563204	0727948348	VIKWATANI	JUNDA	KISAUNI
RAYMOND SAHA	8621277	0706217741	MAUUGUJA	MWAKIRUNGE	BAMBURI
EVERLYNE KASI	11494374	0718818970	MADZOMBANI	MAUNGUJA	BAMBURI
JENNIFER ADIPO	8387873	0723640381	UTANGE		
MICHAEL ONYANGO	8387873	0723640381	UTANGE		KISAUNI
HUSSEIN KENGA NGOW	11876626	0722308168	NGUNI	KISAUNI	MWEMBELEGEZA
JUMA A RINANU	2202911	0725998024	Z/MBE	MAWENI	KONGOWEA
SULEIMAN MDIGO	9627546	0735964279	VIKWATANI	KISAUNI	KISAUNI
BOCHO KHAMISI		0714374390	FRERE TOWN	NYALI	KISAUNI
KABOGO KABILO	13852518	0710472422	MIKATANI	NYALI	KISAUNI
FREDRICK KIBUBA	1013930	0739477551.	KIGEMBENI	BAMBURI	BAMBURI
CORNELIUS KARISA	11641736	0713654712	NGUU-TATU	MWAKIRUNGE	BAMBURI
ANTHONY MWASHIGHADI	9318020	0729590077	NGUU-TATU	KISAUNI	BAMBURI
TAWA MTANJE	20973748	0722850894	BAMBURI	KISAUNI	BAMBURI
MARIAM JUMA ABDULRAHIM	12770548	0717732825	BOMBOLULU	KISAUNI	KISAUNI
VIGILANCE M MGANGA	2250407	0712664361	KISMANI	MAWENI	KONGOWEA
LIVINGSTONE NGABI MUCHIRI	21356452	0721227608	NGUU-TATU	KISAUNI	KISAUNI
JAMES M. MERETHI	22280771	0728731336	NGUU-TATU	KISAUNI	KISAUNI
MUTETI NDUNDA	13711608	0710725652	MWEMBELEGEZA	BAMBURI	MWEMBELEGEZA
JOYCE NDUNE	4630105	0714132435	MAUNGUJA	MWAKIRUNGE	
HABIDA ABDHALA	9476721	0719829984	MAUNGUJA	MWAKIRUNGE	
KASIWA KITHI	2126922	0708091785	BOMTOWN	KISAUNI	KISAUNI
MWANAMWEMA ALI	2265258	0725929737	BADRIA	KONGOWEA	KONGOWEA
SAMMY KARIUKI W.	22520308	0726903361	HARAMBEE ESTATE	KONGOWEA	KISAUNI

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
KANZU K. KAHELA	4992743	0726124522	SHANZU	SHANZU	BAMBURI
NYEVU CHARO BAYA	3933141	0701717987	NGUU-TATU	BAMBURI	KISAUNI
ZUBEDA SAMIRI SUDI	24307919		NGUU-TATU	BAMBURI	KISAUNI
MACRINA MGHOI MWANYIKA	2468581	0718680371	KAJIWENI	JUNDA	KISAUNI
JOYCE POLE	29952413	0735998908	KAJIWENI	JUNDA	KISAUNI
MIRIAM KIMEMIA	8338735	0729201601	ZIWA LA NGOMBE	ZIWA LA NGOMBE	KONGOWEA
ABDALLA MCHANGAMWE	0500497	0723971935	BAMBURI	LOMA	BAMBURI
CLAUDIA MWAKISHIA	6141288	0722629516	KEIMBENI	BAMBURI	BAMBURI
JOYCE AWUORI OBENGELE	10579775	0721240774	KEROPOT	SHANZU	BAMBURI
KHANIFA MGAZIJA	24816789	0720392375	MAJAONI	BAMBURI	BAMBURI
BABITE SAID JILLO	13455328	0723151976	BAMBURI	BAMBURI	BAMBURI
BAJILA SWALEHE JILLO	12786733	0719129477	BAMBURI	BAMBURI	BAMBURI
KOPARINI MWINYIKAI	28425073	0710690253	MKOMANI	MKOMANI	KONGOWEA
GABRIEL CHOWE	11496575	0711117611	VIKWATANI	JUNDA	KISAUNI
ELVIS L.JUSTINE	11762141	0725837463	VIKWATANI	JUNDA	KISAUNI
PASTOR TITUS SITATI	20071001	0720956122	KONGOWEA	KONGOWEA	KONGOWEA
MARY KACHE	0689195	0726394803	BOMBOLULU	KADZAWDAWI	KISAUNI
RACHAEL KAVATA	20974943	0711598453	ASS CHIEF JUNDA	JUNDA	KISAUNI
ENG M.M SABOKE	5812113	0733706141			
DR. EDWARD ONTITA	8772970	0715766266			
DR. ZABLON OONGE	6412436	0733750231			
ATHMAN K. FONDO	22950964	0728803798	AS.CHIEF SHANZU	SHANZU	BAMBURI
SAID K. SIJUME	8620993	0726681135	FRERE TOWN	KISAUNI	KISAUNI
JOYCE K. MUTINDA	2986073	0722221683	COAST WATER SERVICE BOARD		
JOSHUA O. WESA	32741948	0712733562	V.O.K	MAWENI	KONGOWEA
ALI SUDI BOJI	29468503	0713217182	V.O.K	MAWENI	KONGOWEA
ADAM CHENGO MRAMBA	11459221	0726719814	NGUUNI	NGUU-TATU	KISAUNI
JOHN THOYA	8621120	0721162729	FRERE TOWN	KISAUNI	KISAUNI
ESMAEL KENGA	11375724	0729215198	NGUUNI	KISAUNI	RUAKIVUNGA
KAHINDI KAZUNGU	28316174	0701717987	NGUUNI	KISAUNI	BAMBURI
CHARO KENGA	20170092	0725812150	NGUUNI	KISAUNI	BAMBURI
KITSAO CHENGO	28206300	0720572115	NGUUNI	KISAUNI	BAMBURI
JOSEPH KARANI	13141195	0724239498	NGUUNI	KISAUNI	BAMBURI
GEORGE ODHIAMBO	27202204	0723313691	VIKWATANI	JUNDA	KISAUNI



NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
ESTHER N. MUKULE	28152877	0712590692	KACHORORONI	JUNDA	KISAUNI
MUHAMMED O. MUNGUMBA	0503010	0734638633	FRERE TOWN	KISAUNI	KISAUNI
FESTUS MWACHIAGAMBO	5520426	0700545099	KACHORORONI	JUNDA	KISAUNI
EDWARD NDEJE	3961535	0723556343	MAUNGUJA	MAUNGUJA	BAMBURI
BENJAMIN OYUGA	0658764	0705287767	GOROFANI	M/LEGEZI	BAMBURI
VICTORIA SHEM KALAMA	2176028	0722732566	MAUNGUJA	ZIWA LA NGOMBE	KONGOWEA
IMMACULATE ATIENO	22744860	0721928538	ZIWA LA NGOMBE	ZIWA LA NGOMBE	KONGOWEA
ADDIKI ISSA MUKIIZI	27128874	0701590087	VIKWATANI	JUNDA	KISAUNI
BATHULI M CHOME	25560021	0701708515	FRERE TOWN	FRERETOWN	KISAUNI
DORRINE WAKEO	22418337	0712576401	FRERE	FRERE	KISAUNI
KENNETH MWALENGUI	4642734	0728273465	MRAMBEE	KONGOWEA	KONGOWEA
NJEVU CHARO BAYA	3933141		VIPATANI	KONGOWEA	KISAUNI
CATHERINE M. MUEMBU	23581386	0728935418	MISHOMORONI	MANYANI	KISAUNI
SARMA A. JUMA	8621129	0727859456	VIKWATANI	JUNDA	KISAUNI
MARY K. WAMBO	0653124	0714222467	KISMANI	MAWENI	KONGOWEA
ROSINA KITTI	16109136	0727519344	VIKWATANI	JUNDA	KISAUNI
STEPHEN NJUGUNA	13744826	0726113476	VIKWATANI	NGUU-TATU	KISAUNI
ATHMAN CHAI	5333148	0722580144	BAMBURI	BAMBURI	BAMBURI
ZABLON O. MARANIA	2265049	0734708437	MIKONGENI	KISAUNI	KISAUNI
CHARLES MWANGOMBE	0761258	0721629149	MKUNGUNI	KISAUNI	MAWENI
PASCAL THUVA JACOB	13376737	0721319959	NGUU-TATU	BAMBURI	KISAUNI
ESTHER KASUSE	3956734	0721977687	ZIWA LA NGOMBE		
JAKSON CHARO	11262652	0720429358	VIKWATANI	JUNDA	KISAUNI
FRANCIS M. NGALA	14501812	0711583513	VIKWATANI	JUNDA	KISAUNI

Scanned Images of Public Participation Attendance List in Frere Town CDF Hall Kisauni

NORTH MAINLAND — FRERE HALL CAMP

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1	ABDALLA MCHANGAMWE	0500497	0723971935	BAMBURI	LOMA	BAMBURI	
2	CLAUDIE MWAKISHA	6141288	0722889514	KIEMBEZI BAMBURI	BAMBURI KIEMBEZI	BAMBURI	
3	JOYCE AMUORI OBEANGELE	10579715	0721240714	SHANZU	SHANZU	BAMBURI	
4	KHANFA MGAZIJA	24816789	0720392375	MAJANI	BAMBURI	BAMBURI	
5	BABITE SAID JILLO	13455328	0723151976	BAMBURI	BAMBURI	BAMBURI	
6	BAJILA SWALEHE JILLO	12726733	0719129477	BAMBURI	BAMBURI	BAMBURI	
7	KOPARINI MWINDIKAI	28425073	070690253	MKOMANI	MKOMANI	KONGOWEA	
8	GABRIEL CHOWE	11496375	0711117617	LA. VIKWAFANI	JUNDA	KISAUNI	
9	ELVIS T JUSTINE	11762141	0725837463	VIKWAFANI	JUNDA	KISAUNI	
10	PST TITUS SITAI	20071001	0720956122	KONGOWEA	KONGOWEA	KONGOWEA	
11	MART KACHE	0689195	0726394803	Bombolulu	KANZUNGU	KISAUNI	
12	RACHEAL KAYATA	20974443	0711598453	ASSI CHIEF JUNDA	JUNDA	KISAUNI	
13	ENG M.M. SARKKE	55812113	0733706144	—	—	—	
14	Dr Edward Onita	8772970	0715766266	—	—	—	
15	Dr Zaben Donge	6412436	0733780231	—	—	—	
16	AGIMAN K. Fumbo	22950964	0728803798	ASSI-CHIEF SHANZU	SHANZU.	BAMBURI	
17	SAID-K. SHUME	8620993	0726-681135	FRERE TOWN	KISAUNI	KISAUNI	
18	JOYCE K. MUTINDA	2986073	0722-221685	WJTB			
19	JOSHUA O. WESA	32741948	0712733562	V.O.K	MAWENI	KONGOWEA	
20	ALI SUDU BISI	24468503	0713217182	V.O.K	NWENI	KONGOWEA	

NORTH MAINLAND - FRERE HALL CAMP

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	Sign
1	ADAM CHENGO MRAMBA	11459221	0726719814	NGUUNI	KISAUNI	Jumba Ngusata	
2	John Thoma	8621120	0721162729	Freereton	KISAUNI	KISAUNI	
3	Esmael Kengo	11375724	0729215198	NGUUNI	KISAUNI	Rimukukungu	
4	KAHADI KAZUNGUWA	28316174	070177987	NGUUNI	KISAUNI	BAMBURI	
5	Charo Kengo	20170093	0725812150	NGUUNI	KISAUNI	BAMBURI	
6	KITSAO CHENGO	28206300	0720572115	NGUUNI	KISAUNI	BAMBURI	
7	JOSEPH KARANFI	13141195	0924239998	NGUUNI	KISAUNI	BAMBURI	
8	GEORGE OTHIAMBO	27202204	0723373691	VIKWATANI	JUNDA	KISAUNI	
9	ESTHER N. MUKULE	28152877	0712590692	KACHOKORONI	JUNDA	KISAUNI	
10	MOHAMED O. MUNGUMBA	0503010	0734638633	FREREOWN	KISAUNI	KISAUNI	
11	FESTUS MWACHAGAMBO	55204226	0700345009	KACHOKORONI	KISAUNI	KISAUNI	
12	EDWARD NDEJE	3961535	0723556343	MAUNGUJA	KISAUNI	BAMBURI	
13	BENJAMIN OYUGA	0658764	0705287767	GIROFANI	MILEGEZA	BAMBURI	
14	VICTORIA SHAM KALAMU	2176028	0722732566	ZIWALANGUWA	ZWALA-NGUSATA	KONGOWA	
15	Immaculate Atieno	2204066	0721928535	ZIWALANGUWA	ZIWALANGUWA	KONGOWA	
16	Adika BBT MURIKI	24728874	0701570087	VIKWATANI	JUNDA	KISAUNI	
17	BATHULI M. CHOME	25560021	0701708315	FRERETOWN	FRERETOWN	KISAUNI	
18	DELAHE WAKU	22412333	0712576401	FRERE	FRERE	KISAUNI	
19	KENNETH MWAKENGA	4642734	0725273465	KONGOWA	KONGOWA	KONGOWA	
20	Njovu Charo Baya	3933141	07234	Vipatan		KISAUNI	

NORTH MAINLAND - FREERE TOWN HALL CAMP

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1 FREDRICK KIBUBA	1013930	073947735	Kambur	Bamburi	BAMBURI	[Signature]
2 CORACELINE CHARISA	11641234	0713654212	NGUU-TATU	MWAKIRUNGE	BAMBURI	[Signature]
3 Anthony Mwashughodi	9318020	0129 59 00 77	"	"	"	[Signature]
4 TANA MTANJO	70973768	0722950856	Bamburi	KISAONI	BAMBURI	[Signature]
5 MARIAM JUMA ABDULRAHMAN	12770348	0717752825	Bombolulu	KISAONI	KISAONI	[Signature]
6 VIGILANCE M. MGANGA	2250407	071266436	KISIMANI	MWANI	KOINGOWEA	[Signature]
7 LIVINGSTONE Ngaba Mnduri	21356452	0721227608	NGUU-TATU	KISAONI	KISAONI	[Signature]
8 JAMES M. MUKOTI	22280771	0728-731388	NGUU-TATU	KISAONI	KISAONI	[Signature]
9 MUKETI MUNDIA	13711608	071072552	Mwenda	BAMBURI	Mwembaogeze	[Signature]
10 JOYCE DUMIE	4630103	071413243	Maungu	Mwakiunge		[Signature]
11 HANISA ABDALLA	9476721	0719829984	Maungu	Mwakiunge		[Signature]
12 LAISWA KITHI	2126922	0708051781	Bombolulu	KISAONI	KISAONI	[Signature]
13 MWANAMWERIA AH	2265258	0725929737	BADRIA	KOINGOWEA	KOINGOWEA	[Signature]
14 GAMMY KARIMI KI	2252030	0726903661	Karambe	KOINGOWEA	KISAONI	[Signature]
15 KAZUNSU K. KUMBU	4992742	072612452	SITANZU	SITANZU	BAMBURI	[Signature]
16 NYEVU CHARO BAYA	3933141	0701717987	NGUU-TATU	BAMBURI	KISAONI	[Signature]
17 ZUBEIDA SAMIRI SUD	24307919		NGUU-TATU	BAMBURI	KISAONI	[Signature]
18 MACRINA MGHBI MWAVYIKA	24266581	0718660371	KAJIWENI	JUNDA	KISAONI	[Signature]
19 JOYKEY POLE	29952413	0735998808	KAJIWENI	JUNDA	KISAONI	[Signature]
20 MIRIAM KIMEMIA	8338735	0729201604	Ziwa la Ng'ombe	Ziwa la Ng'ombe	KOINGOWEA	[Signature]

3

NORTH MAINLAND - FRERE HALL CAMP.

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1	JULIUS K. SIRYA	13375082	0723178712	BOMBOLULU	KISAUNI	KISAUNI	[Signature]
2	PATRICK S RUWA	13376271	071027030	BAMBURI	KISAUNI	BAMBURI	[Signature]
3	CHIKWANGU KATANA	12843385	0723454252	BIGIRIKANI	MINAKIRUNGE	BAMBURI	[Signature]
4	JAMES HIRO NGALA	5474120	0724983322	BARISHABA	FRERE TOWN	KISAUNI	[Signature]
5	AMINA TUNU NGOSHABA	5472466	070034509	KACHORORORAI	JUNDA	KISAUNI	[Signature]
6	MRAWANA NZORI	0657560	0733709395	MGONGENI	FRERE TOWN	KISAUNI	[Signature]
7	MARI WANJIRU	22314591	0728954519	VIKWATANI	JUNDA	KISAUNI	[Signature]
8	HAMISI BINZANO	20327237	0706720367	VIKWATANI	JUNDA	KISAUNI	[Signature]
9	RIZIKI TANGA	29944107	0764580508	VIKWATANI	JUNDA	KISAUNI	[Signature]
10	JUDITH WAWUDA	13710082	0700450699	VIKWATANI	JUNDA	KISAUNI	[Signature]
11	PETERSON MUMOTA	5563204	0727748318	VIKWATANI	JUNDA	KISAUNI	[Signature]
12	RAYMOND SAHA	8621277	0706217411	Mauunguja	Minakirunge	Bamburi	[Signature]
13	Evelyn Kasi	11494374	0768818970	Madzambani	Mauunguja	Bamburi	[Signature]
14	JENIFER ADIDO	8387573	0723640301	UTANGE		KISAUNI	[Signature]
15	MICHAEL ONYANGO	8382823	0723640351	UTANGE		KISAUNI	[Signature]
16	HUSSEIN KENGA NYORO	1187666	0722508168	KANUNI	KANUNI	Mauunguja	[Signature]
17	JUMA A. RINZINU	2202911	0725990024	ZIMBE	MAWENI	KONGOMBA	[Signature]
18	SULHMAN - MUISO	9627546	0735964279	VIKWATANI	KISAUNI	KISAUNI	[Signature]
19	BOCHO KHAMISI		0716374390	FRERE TOWN	KYALI	KISAUNI	[Signature]
20	KABOGO KABLO	13852518	0710472422	VIKWATANI	"	"	[Signature]

(4)

**12.3.4 List of attendance of public participation meeting held on 6th march 2015 at Licodep hall in likoni from 3.00pm.**

**Table 12-4: Attendance List South Mainland Public Consultation Meeting**

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
GIDEON KAI	8458376	0722600477	SHELLY BEACH	TIMBWANI	LIKONI
HUSSEIN SALIM SOUD	11377333	0724564312	SHELLY BEACH	TIMBWANI	LIKONI
ALI MUHAMMED WIGA	14492934	0723685281	SHELLY BEACH	TIMBWANI	LIKONI
YUSSUF BAHARIA	8526742	0720048567	SWABRINA	TIMBWANI	LIKONI
FRANCIS MTAWALA	5534200	0713646278	MAJI-SAFI	TIMBWANI	LIKONI
SWALEH HAMISI MAKALO	16031627	0721150132	MISURINI	TIMBWANI	LIKONI
SHAFI MWAVUMO	0307303	0713282496	MWATSALABU	BOFU	LIKONI
ALI A. JUMA	3156904	0712024830	LIKONI	LIKONI	LIKONI
RASHID MWALIZUMA	4590470	0735537853	LIKONI	MBOGOYANI	LIKONI
JUMA YUSUF SHAMBA	4540619	0725752541	KIBUYUNI	BOFU	BOFU
JUMA M. MWAKIBUMBA	4602573	0728489016	MIAMI	LIKONI	LIKONI
MUSA JUMA KAZURI	10579316	0718290993	MISURINI	TIMBWANI	LIKONI
AMIR N. BEJITO	12902707	0705987133	APPROVED	TIMBWANI	LIKONI
OMARI MWANGORI	8427244	0715458326	MRIMA	TIMBWANI	LIKONI
BAKARI KEA SABURI	5387940	0722935638	MWEZA	LIKONI	LIKONI
TOKALI MBWANA	0308887	0710129837	MTAAWA PWANI	BOFU	LIKONI
ABOUD ATAMAN	654364	0722369620	VANLOESI	TIMBWANI	LIKONI
ABDULRAHMAN SULEMAN	2238692	0721731095	BOFU	LIKONI	LIKONI
HAMISI HASSAN NGIANZI	13358938	0752130664	SHASHAMAN	TIMBWANI	LIKONI
PUKUKU JUMA		0712170648	MWANAZIA	MAJENKO	LIKONI
ABDALLAH SALIM MALALO	2260558	0787132422	MATHARE	TIMBWANI	LIKONI
HASSAN A SALIMA	11226405	0732671268	MRIMA	TIMBWANI	LIKONI
ALI RAMAHDAN MWAMANJI	25127226	0722159518	LIKONI	LIKONI	LIKONI
ENG. DR. ZABLON OONGE	6412436	0733750231	ZAMCONSULT		
SAID J. KANDY	5385563	0723995908	BOFU MIGOMBANI	BOFU	LIKONI
ENG. MESHAK SABOKE	5812113	0733706141			
DR. EDWARD ONTITA	8772970	0715766266			
LOCAS NJAGI NJERU	30715888	0700368741	MTAAWA MBUZI	TIMBWANI	TIMBWANI
RAMA MUHAMMED	13455905	0700717927	TIMBWANI	TIMBWANI	
HARUSI BAKARI	21645579	0723671633	MBWITA-MILLOW	TIMBWANI	LIKONI

NAME	ID NUMBER	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION
JALIM BARAZA	4596523	0722743469	M. MAPYA	TIMBWANI	LIKONI
ALI OMAR SIMBA	5326906	0710401275	DUDUS	TIMBWANI	LIKONI
MARTIN MWAMBANGA	0661757	0729646702	MAWENI	MSUFUS	LIKONI
FATUMIA NURI	4605973	0727682461	MRIMA	TIMBWANI	
DORIEN MWALIMU	08432674	0708542476	MINA		
REHEMA NGAU	30337054	0702956180	MINA		
BAHATI OMAR	26148752	0727170243	BIAFRA	TIMBWANI	
MWANTUMU OMAR	13837512	0729672455	MMBUTONI	TIMBWANI	
MIRIANATUMU SAID	12489181	0719646701	ZAMZAM	TIMBWANI	
MWATIME HAMISI	1017333	0713792951	MIAMI	TIMBWANI	
MWANAHAMISI MATANO PESA	5384765	0710641989	MATHARE	TIMBWANI	
MARIAM HAMADI	1113487	0721967008	MRIMA	TIMBWANI	
CECILIA MUMBUA KITOLI	24582949	0729962888	MWATSALAFU	LIKONI	
MWANAHAMISI HAMISI	13195474	0721536291	MWANAZIA	TIMBWANI	
SALIMA MASAI	9629933	0723783611	TWAHEED	TIMBWANI	
MWANAJUMA ALI DUARI		0720416460	MVEZAC	BOFU	
RABIA HEMED	16076590	0724241783	BAGAANA	BOFU	
MWANAJUMA HAMISI	3166950	0724241783	MADONGANI	BOFU	
MWANAHAWA BAKARI	13455910	0726608327	MAWENI	TIMBWANI	

Scanned Images of Public Participation Attendance List in Licodep Hall Likoni

SOUTH MAINLAND - LICODEP HALL, MARCH 6, 2015

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1	GIDEON KAI	8458376	0722600477	SHELLY BEACH	TIMBWANI	LIKONI	[Signature]
2	HUSSEIN SALIM SOUD	11377333	0724564312	SHELLY BEACH	TIMBWANI	LIKONI	[Signature]
3	ALI MOHAMMED WIGA	14492934	0723665251	SHELLY BEACH	TIMBWANI	LIKONI	[Signature]
4	MUSSUF BAHARIA	8526742	0720048567	SWARRINA	TIMBWANI	LIKONI	[Signature]
5	FRANCIS MIAWALI	5534200	0713646278	MWISI-SAFI	TIMBWANI	LIKONI	[Signature]
6	SWALEH HAMISI MAKALO	16031627	0721150152	MISUPINI	TIMBWANI	LIKONI	[Signature]
7	SHAFI MWAVUMO	0307303	0713282496	MWATSAWALI	BOFU	LIKONI	[Signature]
8	AL. A. JUMA	3156904	0712024830	LIKONI	LIKONI	LIKONI	[Signature]
9	RASHID S. MWALIZUMA	4590470	0735532853 0726752491	LIKONI	MBOGAYANI	LIKONI	[Signature]
10	JUMA YUSUF SHAMBA	4590619	072433251	KIBUYUNI	BOFU	BOFU	[Signature]
11	JUMA M. MWAKIBUMBO	4602573	0728546806	MWANI	LIKONI	LIKONI	[Signature]
12	MUSA JUMA KIZURI	10579316	0718290993	MISUPINI	TIMBWANI	LIKONI	[Signature]
13	AMIR V. BEITO	12907207	0705982133	APPROVED	TIMBWANI	LIKONI	[Signature]
14	OHAKI MAREKI	8427244	0715455326	MWANI	TIMBWANI	LIKONI	[Signature]
15	BAKARI KEA SARURI	5387940	0722935638	MWEZA	LIKONI	LIKONI	[Signature]
16	TOKALI MRAWANA	0308887	0710129837	MWANAWANA	BOFU	LIKONI	[Signature]
17	ABDUL ATIMAN	0684264	0722369620	YAKOBE	TIMBWANI	LIKONI	[Signature]
18	ABDULKARIM SULEMAN	2238692	0721731045	BOFU	LIKONI	LIKONI	[Signature]
19	HAMISI HASSAN NGANZI	13358935	0752130666	SHASHAMAN	TIMBWANI	LIKONI	[Signature]
20	PURUMBU JUMA		0712170618	MWANAZIA	MWANGAZI	LIKONI	[Signature]



SOUTH MAIN LAND - LICODEP HALL: MARCH 6, 2015

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1	ABDALLAH SALIM MUKALO	2260558	0787132422	MATHARE	TIMBWANI	LIKONI	[Signature]
2	HASSAN A-SALIM	11226405	073262008	MARIMTA	TIMBWANI	LIKONI	[Signature]
3	ALI RAMADHAN MWAMANI	25124226	072159518	LIKONI	LIKONI SUB	LIKONI	[Signature]
4	Eng. J. Zablon Ouge	6412436	0733750231	ZAMCONSULT	-	-	[Signature]
5	SAID J. KANDI	5385563	0723995908	BOFU MUGOMBANI	BOFU	LIKONI	[Signature]
6	Eng. Mednick Saiboko	5812413	073370614	-	-	-	[Signature]
7	Dr. Edward Ontia	8772970	0715716266	-	-	-	[Signature]
8	LOEAS NJIHI NJIRU	30715888	0700-368791	MIRAWAMBEZI	TIMBWANI	TIMBWANI	[Signature]
9	RAMBA MUHAMMED	13455905	0700717727	TIMBWANI	TIMBWANI	LIKONI	[Signature]
10	HANUS BAKAR	21645379	0723-671637	MWITA-MILU	TIMBWANI	HUMU-LIKONI	[Signature]
11	JALIM BARAZA	4596523	0222743469	M MARYA	TIMBWANI	LIKONI	[Signature]
12	ALI OMAR SIMBA	5326906	0710-201275	DUDUS	TIMBWANI	LIKONI	[Signature]
13	MARTIN MWAMBANGA	0661757	0729464702	MWANENI	MESUBUS	LIKONI	[Signature]
14	FATUMA WUR	4605473	072968744	MIRIMA	TIMBWANI	-	[Signature]
15							
16							
17							
18							
19							
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SOUTH MAINLAND - LICODEP HALL; MARCH 6, 2015

MOMBASA LOT 2 PUBLIC CONSULTATION ATTENDANCE LIST

	NAME	ID	PHONE NUMBER	VILLAGE	SUB-LOCATION	LOCATION	SIGN
1	DORIEN MWALIMU	08432674	0708542476	6 MINGA			DOR
2	Rehema ngau	30337054	0702956180	MINGA			Reh
3	Bakati Omar	26148752	0727170243	Biafra	Timbwani		Bakati
4	Mumwinyi A. Omar	13857512	072962255	MUBUTUNI	TIMBWANI		Mumwinyi
5	Mwamburimu Sam	12489181	07101646701	ZANZARI	TIMBWANI		Mwamburimu
6	MWATIME HAMISI	1017533	071379205	MIAMI	H		MWATIME
7	MWANAHAMISI MATANO PETA	5386765	0410641939	MATHARE	TIMBWANI		MWANAHAMISI
8	Mariam Hamadi	11138487	0721967003	MIRIMA	Timbwani		Mariam
9	CECILIA MUMBAKITI	24583949	0729962878	MWATABAFU	KIKONISUBOC		CECILIA
10	MWANAHAMISI HAMISI	13195474	0721536291	MWANAZIA	TIMBWANI		MWANAHAMISI
11	SALMA MASHI	9629933	072378361	TEWAHEED	TIMBWANI		SALMA
12	MWANAJUMA ALI DUGA		072041660	MUEZAC	BOFU		MWANAJUMA
13	RABIA HENED	16076590	072424783	BAGANI	BOFU		RABIA
14	MWANAJUMA HAMISI	3166950	072424783	MABONGAWI	BOFU		MWANAJUMA
15	MWANAHAWA BAKARI	13455910	0726608327	MAWENI	TIMBWANI		MWANAHAWA
16							
17							
18							
19							
20							

3/17/2015



**PROJECT:** REVIEW OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR MOMBASA WATER SUPPLY, EXPANSION OF DISTRIBUTION SYSTEMS, LOT 2

**MEETING:** SCHEDULED PUBLIC PARTICIPATION

**DATE:** 5<sup>TH</sup> AND 6<sup>TH</sup> FEBRUARY 2015

**PRESENTER:** Eng. Dr. Z. I. Oonge / Dr. E.G. Ontita

5th-6th Feb. 2015 Mombasa Lot 2 Water Supply Project 1

### **Purpose of public participation**

- Disseminate information to all interested parties, professionals and the general public
- Gather opinions and useful inputs from them.
- Present useful channels for collection of specific environmental and socio-economic information through the local people.
- Inform the Project-Affected Persons (PAPs) to enable them make necessary contribution/arrangement to minimize adverse impacts.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015 Mombasa Lot 2 Water Supply Project 2

3/17/2015

### Purpose of public participation cont'd....

- Make effective communication with Project-Affected People to gain support for the project. (social license to operate)
- Make effective consultation and dialogue with local residents for cost-effective environmental remedial measures by means of indigenous techniques.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

Mombasa Lot 2 Water Supply Project

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### Background

**Client:** The Government of Kenya- Ministry of Environment, Water and Natural Resources through the Water Services Board (CWSB) Coast

**Project Location:**

- The Project is located in Mombasa County and its coverage area includes:
  1. Mombasa Island.
  2. North Mainland which covers Kisauni area up to Mtwapa creek and the Malindi road strip from Nyali to Shanzu
  3. West Mainland which covers Mazeras up to Changamwe and Port Reitz
  4. South Mainland which also covers likoni and Mtongwe Areas.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

Mombasa Lot 2 Water Supply Project

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3/17/2015

## Existing Water Supply Situation

### Mombasa Island

- Mombasa Island is mainly supplied by Mzima System, Marere System (Changamwe Reservoir-West Mainland) and Sabaki Pipeline (Nguu Tatu Reservoir-North Mainland). The Trunk Mains consist of steel pipes of diameters between 600mm to 900mm. The Distribution Network is more than 50 years old and has a total length of 73 km with pipes ranging between 75mm to 900mm in diameter. The field assessment of the Mombasa Island revealed that:
  - i. There is insufficient bulk water supply and uneven distribution of the water;
  - ii. There are unsupplied areas in the south-east of the Island;
  - iii. Poor informal settlements are not supplied.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

Mombasa Lot 2 Water Supply Project

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## Existing Water Supply Situation Cont'

### Mombasa North Mainland

- Mombasa North Mainland covers Kisauni area up to Mtwapa creek and the Malindi road strip from Nyali to Shanzu is supplied by the Baricho Wells (Sabaki River) through Nguu Tatu reservoir. (Storage capacity 27,100m<sup>3</sup> at 65 masl). The Trunk Mains consist of steel pipes of diameters between 500mm to 800mm. The Distribution Network has a total length of 200 km with pipes ranging between 75mm to 800mm in diameter. The field assessment of the Mombasa North Mainland revealed that:
  - i. The pipes are generally in good condition, except in the Nyali area;
  - ii. There are frequent leaks on large diameter mains. There is need for rehabilitation significant number of appurtenances and structures;
  - iii. There are some areas which are not supplied (high areas, network extremity, undersized secondary and tertiary network, neem tree roots blockages);
  - iv. A Lot of tertiary pipes are located within private properties (Nyali and Shanzu areas);
  - v. Poor areas are not supplied.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

Mombasa Lot 2 Water Supply Project

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3/17/2015

## Existing Water Supply Situation Cont'

### **Mombasa South Mainland**

- Mombasa South Mainland which covers the whole Likoni Division is mainly supplied by Tiwi Boreholes A, C, 4, 7, 8 and 9 by direct pumping and Marere Springs through Kayabombo Reservoir. (Storage capacity 1,140m<sup>3</sup> at 72 masl). The trunk mains consist of steel pipes of diameters between 200mm to 300mm. The distribution network is about 90 km long and consists mainly of AC pipes (including Ukunda and Diani area). The Field Assessment of the Mombasa South Mainland revealed that:
  - i. The AC and PVC-U lines are made of poor class pipes;
  - ii. There are possible water hammers due to direct pumping from Tiwi boreholes (bursts and leaks on the pipes);
  - iii. Northern part of Likoni and Mtongwe town are not supplied (network extremity, undersized network and blockages due to neem tree roots);
  - iv. ON 200 AC line (from Kayabombo to Diani to Mombasa road along Matuga road) is subject to vandalism (some sections are not buried);
  - v. Poor areas are not supplied.
  - vi. Marere Pipeline has been exposed at numerous locations and prone to frequent damages and vandalism.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

Mombasa Lot 2 Water Supply Project

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## Existing Water Supply Situation Cont'

### **Mombasa South Mainland**

- Mombasa West Mainland which covers the whole Chagamwe region is mainly supplied by Mzima springs (Mazeras Reservoir-West Mainland which has a storage capacity 81,000m<sup>3</sup> at 160 masl) and Marere springs directly from Marere pipeline. The lowest part of West Mainland is supplied by Chagamwe reservoir (Kipevu area). The trunk mains consist of steel pipes of diameters between 300mm to 525mm. The distribution network is about 104 km long and consists mainly of PVC-U and steel pipes. The field assessment of the Mombasa West Mainland revealed that:
  - i. There are very high static pressures in the network;
  - ii. There are frequent bursts and leaks (AC and poor class PVC-U). There is therefore need for rehabilitation of a significant number of appurtenances and structures;
  - iii. Areas along Airport and Port Reitz road and Mikindani high area are not well supplied (primary network undersized, difficulty of releasing the air from the pipes);
  - iv. Some pipes have been subject to landslides along Mombasa road;
  - v. Poor areas are not supplied.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

Mombasa Lot 2 Water Supply Project

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## SCOPE OF WORKS

### Mombasa Island

- The proposed works in the Mombasa island include the following:

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
ISW-02	Reinforcement of distribution networks along Tom Mboya Avenue	400	Ferrous	1130
ISW-03	Reinforcement of distribution network along Kisauni Road and biashara street	200	Ferrous	1430
ISW-04	Reinforcement of the supply of Tudor Area Network along Tom Mboya Road	200	Ferrous	250
ISW-05	Along Tom Mboya Avenue connecting to ISW 04 (Augmentation)	150	Ferrous	2400
ISW-06	CONNECTING ISW 08 to ISW 05 (Tudor Area) (Augmentation)	300	Ferrous	600
ISW-08	Along Haile Selassie Road (Augmentation)	200	Ferrous	1100
ISW-09	Along Mnazi Mmoja Road to Moi Avenue connecting with ISW01	300	Ferrous	500

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015      Mombasa Lot 2 Water Supply Project      9

## SCOPE OF WORKS CONT'

### Mombasa North Mainland

- The proposed works in the Mombasa North Mainland include the following:

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
NMW-04	Renewal of Asbestos Cement main from Kiembeni Junction to Bamburi Junction	300	Ferrous	2940
NMW-05	Replacement & Rerouting of Asbestos Cement main pipe between Sheikh Sayed Children Welfare Centre & Kidogobasi Estate	400	Ferrous	2000
NMW-06	Replacement of Asbestos Cement pipe from Kidogobasi Estate to Nyali Road	500	Ferrous	1960
NMW-07	Renewal of Asbestos Cement main along old Malindi road from Kiembeni Junction to Kongowea Area	400 200	Ferrous Ferrous	4485 55
NMW-10	Replacement of Asbestos Cement along Links road	160	uPVC	2750
NMW-11	Replacement of Asbestos Cement along Mt. Kenya road.	110	uPVC	1650

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015      Mombasa Lot 2 Water Supply Project      10

3/17/2015

## SCOPE OF WORKS CONT'

### Mombasa North Mainland Cont'

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
NMW-16	Secondary Network Reinforcement of new 150mm dia. uPVC pipe from new Malindi road to Navy radar station	160	uPVC	750
		110	uPVC	1950
NMW-17	Secondary Network Reinforcement of new 100mm dia. uPVC pipe from new Malindi road to Navy radar station	110	uPVC	1500
NMW-20	Network Extension of 150mm dia. uPVC pipe in Nyali Estate from new Malindi road	110	uPVC	2300
NMW-24	Line along Baobab Holiday Resort (Augmentation)	160	uPVC	1200
NMW-25	Line Connecting NMW08 to NMW17 (Augmentation)	160	uPVC	2000
NMW-27	(1200/ 1000 dia. augmentation) Nguu Tatu connecting to Junda line	1200	Ferrous	700
		1000	Ferrous	2600

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015 Mombasa Lot 2 Water Supply Project 11

## SCOPE OF WORKS CONT'

### Mombasa South Mainland

- The proposed works in the Mombasa South Mainland include the following:

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
SMW-01	Renewal of Asbestos cement line from Diani to Mombasa Road to Mtongwe Town	200	Ferrous	3400
SMW-03	Renewal of 200mm dia. uPVC pipe along Diani to Mombasa Road	200	Steel	3550
SMW-04	Renewal of 200mm dia. uPVC section along Diani to Mombasa road between the two asbestos cement mains from Kayabombo Reservoir	200	Ferrous	3000
SMW-05	New 200mm dia. uPVC distribution line along main street tapped down to Starehe Boys' camp	200	Ferrous	650
SMW	New 1000mm dia. uPVC distribution line along main street tapped down to Starehe Boys' camp	100	Ferrous	600
SMW	New 200mm dia. uPVC distribution line along main street tapped down to Starehe Boys' camp	100	Ferrous	700

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015 Mombasa Lot 2 Water Supply Project 12



3/17/2015

## SCOPE OF WORKS CONT'

### Mombasa South Mainland Cont'

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
SMW-06	New 200mm dia. uPVC pipe connected to Asbestos cement east of Maweni Estate	200	Ferrous	810
SMW	New 150mm dia. uPVC pipe connected to Asbestos cement east of Maweni Estate	150	Ferrous	400
SMW-07	New 150mm dia. uPVC distribution line along Ferry road & Shelly Beach Road along the main street before Wema Cent	150	Ferrous	1810
SMW-08	New Distribution Line 200mm dia. uPVC pipe supplying Maweni Estate to and along coast road	200	Ferrous	4080
SMW-09	New 200mm dia. Distribution Line on Diani to Mombasa road	200	Ferrous	1590

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015      Mombasa Lot 2 Water Supply Project      13

## SCOPE OF WORKS CONT'

### Mombasa West Mainland

■ The main works under lot 2 include:

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
WMW-02	Reinforcement of 150mm dia. uPVC pipe between existing 150mm dia. 150 UPVC pipe on refinery road & 250mm dia. uPVC on Mombasa road	150	Ferrous	1050
WMW-03	Reinforcement of 150mm dia. uPVC pipe between existing 150mm dia. 150 uPVC pipe on refinery road & 250mm dia. uPVC on Mombasa road	150	Ferrous	900
WMW-04	Reinforcement 250 mm dia. pipe connection between Changamwe Road 350 and Port Reitz Road that passes through Soweto Estate	350	Ferrous	850
	Reinforcement 300mm steel pipe connection between Changamwe Road 300 and Port Reitz Road that passes through Soweto Estate	300	Ferrous	200
WMW-05	Reinforcement 200 mm dia. pipe connecting the DN 150 Asbestos Cement 250 Main to Port Reitz Road and the existing DN 150 Asbestos Cement near Health Centre	250	Ferrous	200

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## SCOPE OF WORKS CONT'

### Mombasa West Mainland Cont'

Line ref	Description	Based on 2050 water network analysis		
		Dia.	Type	Length (m)
WMW-06	Reinforcement of 250mm dia. pipe connecting between the existing DN 525 PRC on Mombasa Road and the existing DN 200 Asbestos Cement near Bomu Estate	350	Ferrous	300
	Reinforcement of 250mm dia. Pipe connecting between the existing DN 525 PRC on Mombasa Road and the existing DN200 Asbestos Cement near Bomu Estate	200	Ferrous	1240
WMW-07	Reinforcement of the supply of Wayani and Bukole Estates: New DN 200 PVC-U loop connection between the new DN 250 PVC-U at Wayani Estate and the existing DN 250 PVC-U on Port Reitz Road (Airport Road) and new DN 100 PVC-U between the new PVC-U near Car Park and the existing DN 75 Galvanised Iron (Bukole Estate)	350	Ferrous	2540
		200	Ferrous	350
WMW-08	Reinforcement of 150mm dia. uPVC pipe between asbestos cement on refinery road & pressed reinforced concrete to Changamwe Reservoir	150	Ferrous	250
WMW-09	Reinforcement of 150mm dia. uPVC pipe on Miritini Estate	350	Ferrous	1300
WMW-10	150mm dia. uPVC pipe extension towards Bangladesh poor areas	250	Ferrous	450
		200	Ferrous	600

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015      Mombasa Lot 2 Water Supply Project      15

## SCOPE OF WORKS CONT'

### Mombasa West Mainland Cont'

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
WMW-11	150mm dia. extension towards Jomvu Miritini poor areas	150	Ferrous	1150
WMW-12	300mm dia. steel pipe extension towards Mpirani Village	300	Ferrous	200
	200mm dia. uPVC pipe extension towards Mpirani Village	200	Ferrous	870
WMW-13	Renewal of 250mm dia. pipe along Mombasa Road	250	Ferrous	4300
WMW-14	Replacement of 250mm dia. pipe at Port Reitz Road & Air Port Junction	250	Ferrous	50
WMW-15	Renewal of 150mm dia. asbestos cement pipe along Air Port & Port Reitz road	150	Ferrous	3400

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015      Mombasa Lot 2 Water Supply Project      16

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## SCOPE OF WORKS CONT'


### Mombasa West Mainland Cont'

Line ref	Description	Based on 2030 water network analysis		
		Dia.	Type	Length (m)
WMW-16	Renewal of 150mm dia. asbestos cement pipe along Changamwe Road	150	Ferrous	1020
WMW-17	Renewal of 150 asbestos cement pipe along Changamwe Road	150	Ferrous	6320
WMW-18	Renewal of Existing 150mm dia. Asbestos Cement pipe along Refinery road	150	Ferrous	820
WMW-19	Renewal of Existing 150mm dia. A.C pipe along Refinery road	150	Ferrous	1100
		150	Ferrous	1100
WMW-20	Renewal of Existing 150mm dia. uPVC pipe on Mombasa Road to Jomvu Kuu Village	150	Ferrous	1100
		100	Ferrous	1100
WMW-20	DN 200 mm Connection between Mzima DN 525 Prestressed Reinforced Concrete and Marere DN 400 Steel Trunk Mains at the junction near Zakhem Construction Company warehouse			

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## LAWS AND REGULATIONS GUIDING THE ESIA

The Environmental Impact Assessment is guided by the Environmental Management and Co-ordination Act, 1999 through the National Environment Management Authority (NEMA).



- **EMCA, 1999** : Section 58 of the Environmental Management and Coordination Act (EMCA) Number 8 of 1999, Second Schedule 9 (i), and Environmental (Impact Assessment and Audit) Regulation 2003, stipulate that both new and old projects must undergo Environmental Impact Assessment and Audits.
- EMCA is an act of parliament that establish an appropriate legal and institutional framework for the management of the environment

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015      Mombasa Lot 2 Water Supply Project      18

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## LAWS AND REGULATIONS GUIDING THE ESIA CONT.'



- **The Water Act (Cap 372)** The Water Act makes provision for the conservation, control, apportionment and use of water resources in Kenya, and for incidental and connected purposes. Protection of water supply is clearly a critical issue under the Act. Pollution of water is an offence. The Water Act (2002) aims at providing for harmonized and streamlined management of water resources, water supply and sewerage services. Responsibility for infrastructure development and the provision of services now lies with Water Services Boards (WSB)

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## Laws and Regulations Guiding the ESIA & RAP Process cont.'

- **Occupational Safety and Health Act, 2007**  
It provides for the safety, health and welfare of workers and all persons lawfully present at workplaces.
- **The Public Health Act (CAP. 242)** Part IX Section 8 & 9 of the Act addresses matters of sanitation, hygiene and general environmental health and safety.
- **The Lakes and Rivers Act (Cap 409, rev 1983)** makes provisions for the protection of birds and other wildlife in or on lakes and rivers
- **The Territorial Waters Act** is an Act of parliament to make provision for the delimitation of the territorial waters of Kenya and for purposes incidental thereto
- **The Maritime Zones Act** is An act of parliament to consolidate the law relating to the territorial waters and continental shelf of Kenya; to provide for the establishment and delimitation of the exclusive economic zone of Kenya; to provide for the exploration, exploitation, conservation and management of the resources of the maritime zones and for connected purposes. The regulation would be relevant to disposal of sewage into the ocean through fall out points.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

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## LAWS AND REGULATIONS GUIDING THE ESIA CONT.'



- **Way Leaves under Land Act 2012.** Section 143 (4) states that a way leave shall authorize persons in the employment to or who are acting as agents of or contractors for any of the organizations, authorities and bodies to enter on the servient land for the purpose of executing works, building and maintain installations and structures and insetting all such works, installations and structures on the servient land and to pass and re-pass along that way leave in connection with purposes of those organizations, authorities or bodies.
- Under Section 156.(1) If the Commission is satisfied that there has been any wrongful obstruction of or encroachment on any public right of way, it may make an order requiring the person responsible for that obstruction or encroachment to remove that obstruction or encroachment within the time specified in the order, which shall be not less than fourteen days, and if that order is not complied with within the time specified, the Commission may take any steps which may be necessary for the purpose.

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## LAWS AND REGULATIONS GUIDING THE ESIA CONT.'



- **The Land Act No. 6 of 2012** Section 19. (1) of the Act states that the Commission shall make rules and regulations for the sustainable conservation of land based natural resources. These rules and regulations include;
  - i. Measures to protect critical ecosystems and habitats;
  - ii. Incentives for communities and individuals to invest in income generating natural resource conservation programs;
  - iii. Measures to facilitate the access, use and co- management of forests, water and other resources by communities who have customary rights to these recourses;
  - iv. Procedures for the registration of natural resources in an appropriate register;
  - v. Procedures on the involvement of stakeholders in the management and utilization of land- based natural resources; and
  - vi. Measures to ensure benefit sharing to the affected communities.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

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## LAWS AND REGULATIONS GUIDING THE ESIA CONT.'

- **The Land Act No. 6 of 2012** makes provision for the compulsory acquisition when the land in question for public purposes or in the public interest as related to and necessary for fulfillment of the stated public purpose.



Full compensation shall be paid promptly to all persons affected in accordance to section 113 (1). (2) Subject to Article 40 (2) of the Constitution and section 122 and 128 of this Act, an award-

- a) Shall be final and conclusive evidence of-
  - The size of the land to be acquired;
  - The value, in the opinion of the Commission, of the land;
  - The amount of the compensation payable, whether the persons interested in the land have or have not appeared at the inquiry; and
- b) Shall not be invalidated by reason only of a discrepancy which may thereafter be found to exist between the area specified in the award and the actual area of the land.

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## LAWS AND REGULATIONS GUIDING THE ESIA CONT.'

### Other relevant Sectoral laws are :



- Local Authority Act (Cap. 265)
- Physical Planning Act, 1996
- Penal Code Act (Cap.63)
- The Wildlife Conservation and Management Act, Cap 376
- The Continental Shelf Act
- The Maritime Zones Act
- The HIV and AIDS Prevention and Control Act
- The Constitution of Kenya

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

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## **LAWS AND REGULATIONS GUIDING THE ESIA CONT.'**

### **Relevant World Bank Operational Policies include:**

- Operational Policy (OP) 4.01: Environmental Assessment, 2001
- Operational Policy 4.04: Natural Habitats, 2001
- Operational Policy 4.12: Involuntary Resettlement, 2001
- Operational Policy (OP) 4.10 - Indigenous Peoples, 2005
- Operational Policy (OP/BP) 4.11: Physical Cultural Resources, 2006
- Operation policy (Op/Bp) 4.36: Forestry
- World Bank Policy on Access to Information, 2010

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

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## **POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS EMANATING FROM PROPOSED WORKS**

- Planning phase Impacts
- Construction phase Impacts
- Operation phase Impacts
- Decommissioning phase Impacts

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## Planning Phase Impacts

### NEGATIVE IMPACTS

- Direct land-take for construction leading to loss of land and assets such as, homes and business opportunities
- Displacement of structures and people especially in the urban areas



### Proposed Mitigation in ESMP

- Implementation of the Resettlement Action Plan
- The method of compensation and rates will be agreed between PAPs and CWSB/MOWASCO.
- The preparation prior to construction work will involve public awareness on the roles and responsibilities of environmental stewardship.

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## Construction Phase Impacts

### POSITIVE IMPACTS

- Skills Transfer
- Employment opportunities generated
- Improved overall socio-economic benefits for the people engaged in the project.
- Increased revenues for traders who will have opportunities to supply food to construction workers and provide other services



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## Construction Phase Impacts Cont'd....

### NEGATIVE IMPACTS (are short-term & Reversible)

- Increased Traffic in project areas.
- Loss of vegetation, trees and crops due to clearing and excavation activities
- Loss of topsoil
- Siltation of surface water courses due to sediment load
- Generation of solid and liquid wastes
- Noise pollution from construction plant
- Air pollution from dust
- Influx of migrant workers and possibility of social conflicts
- Spread of STIs and HIV/AIDS
- Possible Occupational Health And Safety hazards to both workers and the public on the site
- Disruption of services e.g. water supply, power, traffic , fibre



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## Construction Phase Cont'd.....

### Proposed Mitigation in ESMMP

- Minimum clearance activities
- Good site management and provision of appropriate human and solid waste disposal facilities
- Proper maintenance of vehicles and other construction machinery - compliance with relevant emission standards.
- Use of Personal Protective Equipment (PPE such as helmets, gloves, sturdy rubber boots, overalls and dust masks on construction crew.
- Sensitization of workers and the surrounding communities on awareness, prevention and management of HIV/AIDS through staff training, awareness campaigns, multimedia, bill boards and workshops or during community *Barazas*.
- Use of barriers and bands to deter non-authorized access to hazard-prone sites
- Provision of Signage throughout the site and all unsafe areas to provide public awareness of the risks
- Selection of routes that avoid traffic prone areas, where possible



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## Construction Phase Cont'd.....

### Proposed Mitigation in ESMMP

- Provision of information, education and communication about safe uses of drinking water.
- Appropriate measures to dispose cleared soil and vegetation to avoid obstruction of water ways
- Hazardous materials to be stored within dedicated areas at work camps in full compliance with regulatory requirements.
- Sound Contractor Practice monitored by the Supervising Engineer
- Reduced Noise near institutions such as schools and hospitals, as well as avoidance of nighttime construction in residential areas.
- Employment unskilled and skilled (if available) labour from the local community.



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## Operational Phase

### POSITIVE IMPACTS (are long-term & Significant)

- 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 associated with water;
- 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;
- Increase in tourism in the area. The project area has many tourist attractions and destinations such as the 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.
- Promotion of 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;

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## Operational Phase

### POSITIVE IMPACTS (are long-term & Significant)

- A comprehensive metering program (of production and consumers) is expected to keep the on 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.

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

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## Operational Phase

### NEGATIVE IMPACTS

- Generation of liquid and solid waste as a result of increased water provision. Especially in informal settlements
- Leakages and bursts during the project lifetime
- Pollution of water resources as a result of increased solid and liquid waste generation

### Proposed Mitigation in ESMMP

- Provision of solid waste collection services and transportation to collection points as well as put in measures for liquid waste collection and treatment to prevent contamination of the Ocean.
- Routine maintenance of pipeline by the CWSB/MOWASCO to prevent leakages and service interruptions

5<sup>th</sup> – 6<sup>th</sup> Feb. 2015

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## Questions and Resolutions



- How many are in support of the project

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## Thank you All!

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## 12.4 Appendix E: Public Participation Minutes

### 12.4.1 Minutes of the Public Consultation Meeting Held at Tudor Chief's Camp On Thursday 5th March at 9.00 Am.

#### i) List of Attendees

Halima K. Abdalla – Chief Tudor Location  
 Stephen Nyamu – Assistant Chief  
 Eng. Dr. Zablon Oonge – Consultant  
 Dr. Edward Ontita – Consultant  
 Eng. Meshack Saboke – Consultant  
 Marion Orina – Consultant  
 Dancan Onyango – Consultant  
 Alex Mogata – Consultant  
 Hafifa – Coast Water Services Board (CWSB)  
 Project Stakeholders

#### ii) General

The meeting started at 9.30 with a word of prayer from one of the stakeholders. The meeting was chaired by Chief Halima. The Chief introduced the Consultant team to the assembled stakeholders in the project and invited the various speakers to make presentations on the project.

#### iii) Presentation by Eng. Dr. Oonge

Eng. Dr. thanked the chief for the introduction and proceeded to give a background of the proposed lot 2 project. He explained that the project was being carried out by the Coast Water Services Board and was being funded by the World Bank. He went ahead to list the proposed project area in the Mombasa Island. This Included:

**Table 12-5: Project Description for Mombasa Island**

Line Ref.	Description	Based on 2030 Water Network Analysis		
		Dia. (mm)	Type	Length(m)
ISW-02	Reinforcement of Distribution Network along Tom Mboya Avenue	400	ferrous	1130
ISW-03	Reinforcement of Distribution Network along Kisauni Road & Biashara Street	200	ferrous	1430
ISW-04	Reinforcement of the supply of Tudor Area Network along Tom Mboya Road	200	ferrous	25
ISW-05	Along Tom Mboya Avenue connecting to ISW 04 (Augmentation)	150	ferrous	2400
ISW-06	Connecting ISW 08 to ISW 05 (Tudor Area) (Augmentation)	300	ferrous	60
ISW-08	Along Haile Selassie Road (Augmentation)	200	ferrous	11
ISW-09	Along Mnazi Mmoja Road to Moi Avenue connecting with ISW01	300	ferrous	500

He further explained that the main sources of water for Mombasa County are:

- Mzima Springs
- Sabaki
- Marere

He added that the water from the sources was not going to be increased, however the existing broken down systems would be improved so as to increase the water supply to areas within the County and reduce water losses. Thus benefiting the people in the area.

#### **iv) Presentation by Dr. Ontita**

Dr. Ontita thanked the participants for attending the meeting and proceeded to state that he would be making a presentation on the various laws governing the ESIA process as well as highlighting the various environmental impacts that would occur throughout the project cycle.

He started off by highlighting the various local laws and regulations governing the ESIA process in the Mombasa Lot 2 project. These included:

- i. The Environmental Management Co-ordination Act of 1999
- ii. The Water Act (Cap 372) 2002
- iii. Occupational Safety and Health Act, 2007
- iv. The Public Health Act (CAP. 242)
- v. The Lakes and Rivers Act (Cap 409, rev 1983)
- vi. The Territorial Waters
- vii. The Maritime Zones Act
- viii. Way Leaves under Land Act 2012
- ix. The Land Act No. 6 of 2012
- x. Local Authority Act (Cap. 265)
- xi. Physical Planning Act, 1996
- xii. Penal Code Act (Cap.63)
- xiii. The Wildlife Conservation and Management Act, Cap 376
- xiv. The Continental Shelf Act
- xv. The Maritime Zones Act
- xvi. The HIV and AIDS Prevention and Control Act
- xvii. The Constitution of Kenya

Dr. Ontita also highlighted the various international policies that were of use and relevance to the project. The policies are mainly the World Bank policies and included the following:

- i) Operational Policy (OP) 4.01: Environmental Assessment, 2001
- ii) Operational Policy 4.04: Natural Habitats, 2001
- iii) Operational Policy 4.12: Involuntary Resettlement, 2001
- iv) Operational Policy (OP) 4.10 - Indigenous Peoples, 2005
- v) Operational Policy (OP/BP) 4.11: Physical Cultural Resources, 2006
- vi) Operation policy (Op/Bp) 4.36: Forestry
- vii) World Bank Policy on Access to Information, 2010

After presenting the various laws that governed the ESIA, Dr. Ontita presented the various environmental and social impacts that would occur throughout the project cycle and provided the proposed mitigation measures. He explained that different impacts, both good and bad would occur during all phases of the project life cycle. These included, impacts during the planning phase, construction phase, operation phase and decommissioning phase. After presenting the various impacts of the project as well as the mitigation measures the Doctor concluded his presentation.

**v) Questions Observations and Answers**

The consultant then invited the participants to ask their questions as well as provide observations for inclusion in the report. The questions asked are as follows:

**a) Questions**

- 1) Samuel Opande from Spark B area – asked what would be done to reduce dust created by the construction in the area. He also stated that several schools were not being supplied, and asked if they had been included in the areas to be supplied. Finally he stated that there were areas where sewage and water pipelines were close to each other whereby people were making illegal connections to the water lines, however these people were accidentally putting the illegal connections on the sewerage line and not the water line and thus were distributing waste water instead of clean water, he went on to ask if something was being done about the situation.
- 2) Amina Kiema from Tudor – pointed out that when the project is being carried out the youth from the area be given priority for jobs. She stated that the youth in the area had skills and no jobs and would benefit from the jobs within the project.
- 3) Saadiya Mohamed from Jua Kali area – stated that she was a water kiosk owner in the area, and that they would lose business if there would be adequate water, she asked what would happen to them. She further asked if the new pipelines would be un-metered. Finally she asked when the project was starting.
- 4) Philemon Mwamburi from Spark B – asked if there were any new pipelines being constructed or it was just the existing network being replaced, he also stated that he came from one of the sources of water in the area (Mzima Springs) and that the people in the area did not have any water, even though water was being sourced from their area, he asked if they could be taken into consideration.
- 5) Charles Ounda from gorofani railway – asked why some areas of Changamwe had water throughout, while some areas in Mombasa Island did not get any. He also asked about the problems faced by the individual connections, could CWSB explain why water did not get to houses.
- 6) Maxwell Odada from Tudor- asked if there were feasibility studies that had been carried out for sources of water within Mombasa County so as to assure self-reliance, secondly he pointed out that the high cost of water was as a result of pumping water, was it possible to find another source of electricity for pumping purposes, for example solar.
- 7) Jackson Omwebu from makande posta- asked if multi-storey buildings would have water pumped to the top floors, he further asked if the water supply would be continuous.
- 8) Penninah Mwaka from Tudor- asked when the project would start as they had been waiting for a long time for the project to start and it never seemed to come.
- 9) Norman Mutiso from Tudor- stated that everyone in the meeting was a parent and stated that the constitution made allowances for local employment, thus their children had to get jobs. He stated that this was an ultimatum of the people which had to be met for the project to continue.
- 10) Mzee William Akatu from Tudor- asked how CWSB would ensure that the water would be evenly distributed

**b) Answers**

- 1) Eng. Dr. Oonge stated that dust had already been covered as one of the environmental impacts and spraying of water on the roads along the proposed works was proposed as a mitigation to the impact of dust. Concerning the schools without water, he advised the schools to make applications to the water service provider in this case Mombasa Water and Sewerage Company (MOWASCO) for connections, in the same regard, he advised Samuel to report the illegal sewerage connections to MOWASCO as it was a health risk.

- 2) Eng. Dr. stated that most of the unskilled labor would be sourced locally and skilled labor if available. He however pointed out that the County was small and that the people of Mombasa Island should not be opposed to the Contractor sourcing workers from the rest of the county. However her observation was noted and would be presented to the client as part of the minutes.
- 3) Eng. Dr. Oonge stated that all water provided by CWSB and MOWASCO had to be metered, thus there would be no unmetered water. Concerning the commencement of work, he explained that the contractor had already been selected through a tendering process and that all was needed for work to start was the ESIA review.
- 4) Eng. Dr. Oonge reiterated the proposed works for Mombasa Island under lot 2 and further stated that the source of water (Mzima) was not under the scope of this project, however his observation had been noted and would be presented to the client under the minutes of the meeting.
- 5) Eng. Dr. Oonge stated that the lack of water in some of the areas was the reason for the project for the augmentation of the Mombasa lot 2 pipelines. He assured the people that once the project is completed, water would be available in the aforementioned project areas. Concerning the problems with the individual connections, he explained that, that was beyond the mandate of CWSB and that they should contact MOWASCO instead.
- 6) Eng. Dr. Oonge explained that water was a national resource and not under the county government as such no county could control the water, as such could not prevent the water abstraction but gain some benefit from the water project. He further stated that the cost of electricity fluctuates as such, the cost of water would vary based on the cost of generation and was not always high.
- 7) Eng. Dr. Oonge stated that it was difficult to give the exact date when the project would start, however reiterated that a contractor had been identified.
- 8) Eng. Dr. Oonge informed the participants that their opinions and comments had been noted for action by CWSB.
- 9) Eng. Dr. Oonge explained that the main aim of the project was to re-distribute the water evenly to all the areas in Mombasa County.

#### **vi) Conclusion**

Eng. Dr. Oonge then asked the participants if they were in support of the project, the participants were unanimous in their support of the project.

#### **vii) Vote of Thanks and Close of the Meeting**

The Assistant Chief thanked all parties for attending and participating in the meeting, stating that he hoped the project would be implemented as soon as possible as the stakeholders were in great need of the water, and that water is life.

The meeting ended with a word of prayer at 11.30 am.

### ***12.4.2 Minutes of the Public Consultation Meeting Held at St. Mary's Catholic Hall in Changamwe On Thursday 5th March At 2.30pm.***

#### **i) List of Attendees**

Isaac Makau – Chief Changamwe

Ima Matano – Assistant Chief Birikani (Mikindani)

Lucrencia Mbashu – Chief Port Reitz

Eng. Dr. Zablon Oonge – Consultant



Dr. Edward Ontita – Consultant  
 Eng. Meshack Saboke – Consultant  
 Marion Orina – Consultant  
 Dancan Onyango – Consultant  
 Alex Mogata – Consultant  
 Hafifa – Coast Water Services Board (CWSB)  
 Project Stakeholders

**ii) General**

The meeting started at 2.30pm with a word of prayer from one of the stakeholders. The meeting was chaired by Chief Isaac makau. The Chief introduced the Consultant team to the assembled stakeholders in the project and invited the various speakers to make presentations on the project.

**iii) Presentation by Eng. Dr. Oonge**

Eng. Dr. thanked the chief for the introduction and proceeded to give a background of the proposed lot 2 project. He explained that the project was being carried out by the Coast Water Services Board and was being funded by the World Bank. He went ahead to list the proposed project area in the Mombasa Island. This Included:

**Table 12-6: Project Description for Mombasa West Mainland**

Line Ref.	Description	Based on 2030 Water Network Analysis		
		Dia.	Type	Length(m)
WMW-02	Reinforcement of 150mm dia. uPVC pipe between existing 150mmdia. uPVC pipe on refinery road & 250mm dia. uPVC on Mombasa road	150	ferrous	1050
WMW-03	Reinforcement of 150mm dia. uPVC pipe between existing 150mmdia. uPVC pipe on refinery road & 250mm dia. uPVC on Mombasa road	150	ferrous	900
WMW-04	Reinforcement 250 mm dia. pipe connection between Changamwe Road and Port Reitz Road that passes through Soweto Estate	350	ferrous	850
	Reinforcement 300mm steel pipe connection between Changamwe Road and Port Reitz Road that passes through Soweto Estate	300	ferrous	200
WMW-05	Reinforcement 200 mm dia. pipe connecting the DN 150 Asbestos Cement Main to Port Reitz Road and the existing DN 150 Asbestos Cement near Health Centre	250	ferrous	200
WMW-06	Reinforcement of 250mm dia. pipe connecting between the existing DN 525 PRC on Mombasa Road and the existing DN 100 Asbestos Cement near Bomu Estate	350	ferrous	300
	Reinforcement of 250mm dia. pipe connecting between the existing DN 525 PRC on Mombasa Road and the existing DN 100 Asbestos Cement near Bomu Estate	200	ferrous	1240

WMW-07	Reinforcement of the supply of Wayani and Bukole Estates: New DN 200 PVC-U loop connection between the new DN 250 PVC-U at Wayani Estate and the existing DN 250 PVC-U on Port Rietz Road (Airport Road) and new DN 100 PVC-U between the new PVC-U near Car Park and the existing DN 75 Galvanized Iron (Bukole Estate)	350	ferrous	2540
		200	ferrous	350
WMW-08	Reinforcement of 150mm dia. uPVC pipe between asbestos cement on refinery road & pressed reinforced concrete to Changamwe Reservoir	150	ferrous	250
WMW-09	Reinforcement of 150mm dia. uPVC pipe on Miritini Estate	350	ferrous	1300
		250	ferrous	450
WMW-10	150mm dia. uPVC pipe extension towards Bangladesh poor areas	200	ferrous	600
WMW-11	150mm dia. extension towards Jomvu Miritini poor areas	150	ferrous	1150

He further explained that the main sources of water for Mombasa County are:

- Mzima Springs
- Sabaki
- Marere

He added that the water from the sources was not going to be increased, however the existing broken down systems would be improved so as to increase the water supply to areas within the County and reduce water losses. Thus benefiting the people in the area.

#### **iv) Presentation by Dr. Ontita**

Dr. Ontita thanked the participants for attending the meeting and proceeded to state that he would be making a presentation on the various laws governing the ESIA process as well as highlighting the various environmental impacts that would occur throughout the project cycle.

He started off by highlighting the various local laws and regulations governing the ESIA process in the Mombasa Lot 2 project. These included:

- i. The Environmental Management Co-ordination Act of 1999
- ii. The Water Act (Cap 372) 2002
- iii. Occupational Safety and Health Act, 2007
- iv. The Public Health Act (CAP. 242)
- v. The Lakes and Rivers Act (Cap 409, rev 1983)
- vi. The Territorial Waters
- vii. The Maritime Zones Act
- viii. Way Leaves under Land Act 2012
- ix. The Land Act No. 6 of 2012
- x. Local Authority Act (Cap. 265)
- xi. Physical Planning Act, 1996
- xii. Penal Code Act (Cap.63)
- xiii. The Wildlife Conservation and Management Act, Cap 376
- xiv. The Continental Shelf Act
- xv. The Maritime Zones Act
- xvi. The HIV and AIDS Prevention and Control Act
- xvii. The Constitution of Kenya

Dr. Ontita also highlighted the various international policies that were of use and relevance to the project. The policies are mainly the World Bank policies and included the following:

- i. Operational Policy (OP) 4.01: Environmental Assessment, 2001
- ii. Operational Policy 4.04: Natural Habitats, 2001
- iii. Operational Policy 4.12: Involuntary Resettlement, 2001
- iv. Operational Policy (OP) 4.10 - Indigenous Peoples, 2005
- v. Operational Policy (OP/BP) 4.11: Physical Cultural Resources, 2006
- vi. Operation policy (Op/Bp) 4.36: Forestry
- vii. World Bank Policy on Access to Information, 2010

After presenting the various laws that governed the ESIA, Dr. Ontita presented the various environmental and social impacts that would occur throughout the project cycle and provided the proposed mitigation measures. He explained that different impacts, both good and bad would occur during all phases of the project life cycle. These included, impacts during the planning phase, construction phase, operation phase and decommissioning phase. After presenting the various impacts of the project as well as the mitigation measures the Doctor concluded his presentation.

#### **v) Questions Observations and Answers**

The consultant then invited the participants to ask their questions as well as provide observations for inclusion in the report. The questions asked are as follows:

##### **a) Questions**

- 1) David mbogho from national housing in Changamwe-asked who was in charge of fixing individual connections?
- 2) Jeremiah kinyanyui from port Rietz-asked if the old lines would be removed he also asked what measures would be taken to ensure that no disruption of water when the lines were being replaced. He also wanted to know if the new lines would lie parallel to the existing lines. He further asked what the criteria for employment would be.
- 3) Mary ramtu from Bomu-stated that they haven't had water in her estate (hamisi estate) since last year. She said that they had been informed to buy certain items and wanted to know if they did would it solve the water problem.
- 4) Benson mganga from Wayani- stated that there was corruption when it came to water provision resulting in water scarcity, he wanted to know what was being done about it.
- 5) Christopher odipo otiki from Changamwe-stated that the project being talked about was long term and may not happen immediately, he wanted to know what could be done for immediate assistance.
- 6) Jeremiah kinyonyei from bokole- asked if there would be committees in the particular project area.
- 7) Bwana joseph Tito from bokole- asked if people who did not have illegal structures would be compensated. He also wanted to know how CWSB would ensure that the right owner is compensated rather than the pretenders.
- 8) Margaret nyangasi from Kibarani- stated that their water company did not come to read the meters and at the end of the month would give an inaccurate estimation. She also said that people need to move from their places
- 9) Mary ramtu from Bomu- asked what was being done to regulate the prices of water because of the fluctuation
- 10) Nyamvule lenga from port Rietz - wanted to know why port Rietz towards the hospital had never had water.
- 11) Charles Oliviah from bokoli-wanted to know when the project would start.
- 12) Charles mwakio from chaani- stated that there were no big pipelines in chaani.

- 13) Tatu mwangi from hamisi- asked why there was a difference between the water from Marere and Mzima and why the water from Mzima springs was inconsistent. She also stated that MOWASCO needed to provide consistent water.
- 14) Joseph were from Changamwe- stated that MOWASCO needed to give consistent water especially to vendors.
- 15) Phoebe mbinji from Bangladesh- requested her fellow members to stop digressing from the topic at hand. She stated that the reason for the project was to redistribute the existing water

**b) Answers**

- 1) Eng. Dr. Oonge stated CWSB was in charge of laying large pipes, it was the mandate of Mombasa water and sewerage company (MOWASCO) to lay smaller pipes. He also said that individuals would fix their own lines.
- 2) Eng. Dr. Oonge stated that not all lines would be discarded. The reusable lines would be removed and reused again. He also said that the project would be subject to interruptions (no pain no gain). He also said that on the criteria of employment, they would provide recommendations on that for implementation by CWSB and the contractor.
- 3) Eng. Dr. Oonge stated that they would make recommendations for the problem Mary ramtu had brought up to CWSB for action.
- 4) Eng. Dr. Oonge clarified that corruption was a two way street and that it was difficult to point out corruption and as such provide a permanent solution to it.
- 5) Eng. Dr. Oonge stated that the project was the most immediate assistance being offered. He further said that the project was a long term project whose benefits would be felt for a very long time.
- 6) Eng. Dr. Oonge stated that forming individual committees was not a requirement in this case and that the committees were usually formed during resettlement action plan (RAP).
- 7) Dr. Ontita stated that compensation would be done for all structures and that the chiefs would be used to verify the truthfulness of ownership claims.
- 8) Eng. Dr. Oonge stated that CWSB was not responsible for taking meter readings, the relevant people to be addressed on that were MOWASCO, however they would point it out to them.
- 9) Eng. Dr. Oonge they could not regulate prices of water being sold by vendors because those were private entities who were out of their control.
- 10) Eng. Dr. Oonge listed all the project areas and stated that if the stakeholders' home was not listed, it may be under MOWASCO.
- 11) Eng. Dr. Oonge stated that a contractor had already been identified all that remained was the completion of the report being carried out. He further stated that the project duration was unknown but standard projects usually take one year.
- 12) Eng. Dr. Oonge told Charles that they would inquire on the subject that he brought up.
- 13) Eng. Dr. Oonge stated that all water was underground water and since type of rock varies from place to place the mineral content of the water from those was bound to also vary hence the different taste of water from the two places. He also stated the cause of inconsistency in supply was an issue best answered by MOWASCO but it was because of this lack of water that had brought about this project
- 14) Eng. Dr. Oonge also stated that the issue with supply of water to vendors was under MOWASCO jurisdiction.

**vi) Conclusion**

Eng. Dr. Oonge then asked the participants if they were in support of the project, the participants were unanimous in their support of the project.

**vii) Vote of Thanks and Close of the Meeting**

The Chief of port Rietz thanked all parties for attending and participating in the meeting, stating that she hoped the project would be implemented as soon as possible as the stakeholders were in great need of the water.

The meeting ended with a word of prayer at 5.00pm

**12.4.3 Minutes of the Public Consultation Meeting Held at Frere Town CDF Hall in Kisauni on Friday 6th March at 9.50am.**

**i) List of Attendees**

- Said Shume– Chief Kisauni
- Rachael Kavata– Assistant Chief junda
- Athman K. Fondo– Chief Port Reitz
- Eng. Dr. Zablon Oonge – Consultant
- Dr. Edward Ontita – Consultant
- Eng. Meshack Saboke – Consultant
- Marion Orina – Consultant
- Dancan Onyango – Consultant
- Alex Mogata – Consultant
- Joyce k. Mutinda – Coast Water Services Board (CWSB)
- Project Stakeholders

**ii) General**

The meeting started at 9.50am with a word of prayer from a village elder. The meeting was chaired by chief Said Shume the Chief introduced the Consultant team to the assembled stakeholders in the project and invited the various speakers to make presentations on the project.

**iii) Presentation by Eng. Dr. Oonge**

Eng. Dr. thanked the chief for the introduction and proceeded to give a background of the proposed lot 2 project. He explained that the project was being carried out by the Coast Water Services Board and was being funded by the World Bank. He went ahead to list the proposed project area in the Mombasa Island. This Included:

**Table 12-7: Project Description for Mombasa North Mainland**

Line Ref.	Description	Based on 2030 Water Network Analysis		
		Dia.	Type	Length(m)
NMW-04	Renewal of Asbestos Cement main form Kiembeni Junction to Bamburi Junction	300	ferrous	2940
NMW-05	Replacement & Rerouting of Asbestos Cement main pipe between Sheikh Sayed Children Welfare Center & Kidogobasi Estate	400	ferrous	2000
NMW-06	Replacement of Asbestos Cement pipe from Kidogobasi Estate to Nyali Road	500	ferrous	1960
NMW-07	Renewal of Asbestos Cement main along old Malindi road from Kiembeni Junction to Kongowea Area	400	ferrous	4485
		200	ferrous	55

NMW-10	Replacement of Asbestos Cement along Links road	160	uPVC	2750
NMW-11	Replacement of Asbestos Cement along Mt. Kenya road.	110	uPVC	1650
NMW-16	Secondary Network Reinforcement of new 150mm dia. uPVC pipe from new Malindi road to Navy radar station	160	uPVC	750
		110	uPVC	1950
NMW-17	Secondary Network Reinforcement of new 100mm dia. uPVC pipe from new Malindi road to Navy radar station	110	uPVC	1500
NMW-20	Network Extension of 150mm dia. uPVC pipe in Nyali Estate from new Malindi road	110	uPVC	2300
NMW-24	Line along Baobab Holiday Resort (Augmentation)	160	uPVC	1200
NMW-25	Line Connecting NMW08 to NMW17 (Augmentation)	160	uPVC	2000
NMW-27	Nguu Tatu connecting to Junda line (1200/ 1000 dia. augmentation)	120	ferrous	700
		100	ferrous	2600

He further explained that the main sources of water for Mombasa County are:

- Mzima Springs
- Sabaki
- Marere

He added that the water from the sources was not going to be increased, however the existing broken down systems would be improved so as to increase the water supply to areas within the County and reduce water losses. Thus benefiting the people in the area.

#### **iv) Presentation by Dr. Ontita**

Dr. Ontita thanked the participants for attending the meeting and proceeded to state that he would be making a presentation on the various laws governing the ESIA process as well as highlighting the various environmental impacts that would occur throughout the project cycle.

He started off by highlighting the various local laws and regulations governing the ESIA process in the Mombasa Lot 2 project. These included:

- i. The Environmental Management Co-ordination Act of 1999
- ii. The Water Act (Cap 372) 2002
- iii. Occupational Safety and Health Act, 2007
- iv. The Public Health Act (CAP. 242)
- v. The Lakes and Rivers Act (Cap 409, rev 1983)
- vi. The Territorial Waters
- vii. The Maritime Zones Act
- viii. Way Leaves under Land Act 2012
- ix. The Land Act No. 6 of 2012
- x. Local Authority Act (Cap. 265)
- xi. Physical Planning Act, 1996
- xii. Penal Code Act (Cap.63)
- xiii. The Wildlife Conservation and Management Act, Cap 376
- xiv. The Continental Shelf Act
- xv. The Maritime Zones Act
- xvi. The HIV and AIDS Prevention and Control Act

xvii. The Constitution of Kenya

Dr. Ontita also highlighted the various international policies that were of use and relevance to the project. The policies are mainly the World Bank policies and included the following:

- i. Operational Policy (OP) 4.01: Environmental Assessment, 2001
- ii. Operational Policy 4.04: Natural Habitats, 2001
- iii. Operational Policy 4.12: Involuntary Resettlement, 2001
- iv. Operational Policy (OP) 4.10 - Indigenous Peoples, 2005
- v. Operational Policy (OP/BP) 4.11: Physical Cultural Resources, 2006
- vi. Operation policy (Op/Bp) 4.36: Forestry
- vii. World Bank Policy on Access to Information, 2010

After presenting the various laws that governed the ESIA, Dr. Ontita presented the various environmental and social impacts that would occur throughout the project cycle and provided the proposed mitigation measures. He explained that different impacts, both good and bad would occur during all phases of the project life cycle. These included, impacts during the planning phase, construction phase, operation phase and decommissioning phase. After presenting the various impacts of the project as well as the mitigation measures the Doctor concluded his presentation.

**v) Questions Observations and Answers**

The consultant then invited the participants to ask their questions as well as provide observations for inclusion in the report. The questions asked are as follows:

**a) Questions**

- 1) Mary kache from Bombolulu area- asked when the project would start
- 2) Athman Chai from Bamburi- stated that there had been previous laying of pipes in his area and sought clarification if that was the project that was being undertaken by coast water service board. He also asked if the project affected persons (PAPS) had been identified and if so if grassroot meetings with the PAPS had been carried out. He went ahead to ask what criteria would be used for local employment
- 3) A participant stated that there had been a project with Netherlands and asked if this was it.
- 4) Miriam Kimemia from ziwa la ngombe-stated that were pipelines but hadn't reached her area
- 5) A participant from Bombolulu asked if and ESIA had been carried out earlier
- 6) Juma alfeni rinanu from Maweni- wanted to know the project area
- 7) Sarma Ali juma from vikwatani- stated that she lives near the tanks but doesn't get water she wanted to know if the project would ensure that the people around the mains would also get water.
- 8) Habida abdalla from maunguja-asked if women would also get jobs from the project implementation
- 9) George odhiambo from vikwatani asked if he was a pap and if the county could get more storage tanks
- 10) Athman chai from Bamburi-stated that their pipes were dilapidated and wanted to know what was being done to fix that.
- 11) Bwana nzori from mgongeni- applauded the fact that public consultation meetings were being carried out since there had been many previous projects carried out with no public consultation held.
- 12) Kenneth mwalengui from Kongowea-asked why many smaller areas had not been catered for. He also asked if the project being carried out was the same as the one being done in four villages within his area.
- 13) Victoria Shem khalama from maunguja- asked if the proposed pipeline that was to serve the hospital was part of the project.

- 14) Khanifa mgazija from majaoni- asked what methods had been used to select the contractor for the project. She also asked what was being done to ensure public safety and finally stated that the contractor should use local administrators when hiring not politicians.
- 15) Patrick ruwa from Nguu Tatu- asked if there would be compensation if the pipe passed through an undeveloped plot

**b) Answers**

- 1) Eng. Dr. Oonge stated that a contractor had been identified and was waiting for the EIA report so as to start. He also stated that the project duration is unknown
- 2) Eng. Dr. Oonge stated that project affected people had been identified and let the representative from CWSB elaborate more. He also stated that he would make recommendations and the contractor would liaise with the local administration
- 3) Eng. Dr. Oonge clarified that the projects were not the same, one was vitens
- 4) Eng. Dr. Oonge also said that they would make recommendations
- 5) Eng. Dr. Oonge also stated that an EIA done with a report done and a license given. He clarified that this was a review of a previously carried out
- 6) Joyce Kimemia from coast water service board, in response to question three and four stated that the green pipes were under AFD and their conditions did not require rap. She also said that the project was undergoing but was slow
- 7) Joyce Kimemia from coast water service board also said, in relation to question 2 that RAP issues would be dealt with the following week.
- 8) Eng. Dr. Oonge went ahead and reread the project area stating what type of pipe would be placed there.
- 9) Eng. dr. Oonge stated that reservoir tanks were placed at the highest point to serve the most people by gravity
- 10) Eng. Dr. Oonge also stated that jobs would be given based on merit, regardless of sex.
- 11) Eng. Dr. Oonge stated that the purpose of the project was to replace worn out pipes and add new lines for better water distribution
- 12) Eng. Dr. Oonge stated that projects require public consultation
- 13) Joyce Kimemia from coast water service board stated that CWSB had many projects funded by different donors with different requirements.
- 14) Joyce Kimemia from coast water service board stated that concerning the informal settlements, that was a different project.
- 15) Joyce Kimemia from coast water service board also stated that it was good for the people to find out if there was compensation from the relevant authorities and to know if they qualified for compensation. She further stated that if one had encroached there would be negotiations
- 16) Dr. Ontita stated that our report included safety procedures which CWSB would use to monitor the contractor with.
- 17) Dr. Ontita also stated that if the pipeline passed in the middle of an undeveloped plot then development on that plot would be impossible hence negotiations would be done on compensation.

**vi) Conclusion**

Eng. Dr. Oonge then asked the participants if they were in support of the project, the participants were unanimous in their support of the project.

**vii) Vote of Thanks and Close of the Meeting**

Bwana Nzori thanked all parties for attending and participating in the meeting and advised coast water service board to continue involving the public.



The meeting ended with a word of prayer from Bwana Nzori at 11.30 am.

#### **12.4.4 Minutes of the Public Consultation Meeting Held at Licodep Hall in Likoni on Friday 6th March at 3.00pm.**

##### **i) List of Attendees**

Ali ramadhan mwamanji– Ass Chief Likoni  
 Hassan abdalla– Assistant Chief Timbuani sub-location  
 Said juma kandi– Ass Chief Bofu (rep. the likoni chief)  
 Eng. Dr. Zablon Oonge – Consultant  
 Dr. Edward Ontita – Consultant  
 Eng. Meshack Saboke – Consultant  
 Marion Orina – Consultant  
 Dancan Onyango – Consultant  
 Alex Mogata – Consultant  
 Joyce k. Mutinda – Coast Water Services Board (CWSB)  
 Project Stakeholders

##### **ii) General**

The meeting started at 3.00 with a word of prayer from a village elder. The meeting was chaired by ass. Chief Said Juma Kandi The Ass. Chief introduced the Consultant team to the assembled stakeholders in the project and invited the various speakers to make presentations on the project.

##### **iii) Presentation by Eng. Dr. Oonge**

Eng. Dr. thanked the chief for the introduction and proceeded to give a background of the proposed lot 2 project. He explained that the project was being carried out by the Coast Water Services Board and was being funded by the World Bank. He went ahead to list the proposed project area in the Mombasa Island. This Included:

**Table 12-8: project Description for Mombasa South Mainland**

Line Ref.	Description	Based on 2030 Water Network Analysis		
		Dia.	Type	Length(m)
SMW-01	Renewal of Asbestos cement line from Diani to Mombasa Road to Mtongwe Town	200	Ferrous	3400
SMW-03	Renewal of 200mm dia. uPVC pipe along Diani to Mombasa Road	200	Steel	3550
SMW-04	Renewal of 200mm dia. uPVC section along Diani to Mombasa road between the two asbestos cement mains from Kayabombo Reservoir	200	Ferrous	3000
SMW-05	New 200mm dia. uPVC distribution line along main street tapped down to Starehe Boys' camp	200	Ferrous	650

	New 1000mm dia. uPVC distribution line along main street tapped down to Starehe Boys' camp	1 0	Ferrous	600
	New 100mm dia. uPVC distribution line along main street tapped down to Starehe Boys' camp	1 0	Ferrous	700
SMW-06	New 200mm dia. uPVC pipe connected to Asbestos cement east of Maweni Estate	2 0	Ferrous	810
	New 150mm dia. uPVC pipe connected to Asbestos cement east of Maweni Estate	1 5	Ferrous	400
SMW-07	New 150mm dia. uPVC distribution line along Ferry road & Shelly Beach Road along the main street before Wema Center	1 5	Ferrous	1810
SMW-08	New Distribution Line 200mm dia. uPVC pipe supplying Maweni Estate to and along coast road	2 0	Ferrous	4080
SMW-09	New 200mm dia. Distribution Line on Diani to	2 0	Ferrous	1590

He further explained that the main sources of water for Mombasa County are:

- Mzima Springs
- Sabaki
- Marere

He added that the water from the sources was not going to be increased, however the existing broken down systems would be improved so as to increase the water supply to areas within the County and reduce water losses. Thus benefiting the people in the area.

#### **iv) Presentation by Dr. Ontita**

Dr. Ontita thanked the participants for attending the meeting and proceeded to state that he would be making a presentation on the various laws governing the ESIA process as well as highlighting the various environmental impacts that would occur throughout the project cycle.

He started off by highlighting the various local laws and regulations governing the ESIA process in the Mombasa Lot 2 project. These included:

- i. The Environmental Management Co-ordination Act of 1999
- ii. The Water Act (Cap 372) 2002
- iii. Occupational Safety and Health Act, 2007
- iv. The Public Health Act (CAP. 242)
- v. The Lakes and Rivers Act (Cap 409, rev 1983)
- vi. The Territorial Waters
- vii. The Maritime Zones Act
- viii. Way Leaves under Land Act 2012
- ix. The Land Act No. 6 of 2012
- x. Local Authority Act (Cap. 265)
- xi. Physical Planning Act, 1996
- xii. Penal Code Act (Cap.63)
- xiii. The Wildlife Conservation and Management Act, Cap 376
- xiv. The Continental Shelf Act

- xv. The Maritime Zones Act
- xvi. The HIV and AIDS Prevention and Control Act
- xvii. The Constitution of Kenya

Dr. Ontita also highlighted the various international policies that were of use and relevance to the project. The policies are mainly the World Bank policies and included the following:

- viii. Operational Policy (OP) 4.01: Environmental Assessment, 2001
- ix. Operational Policy 4.04: Natural Habitats, 2001
- x. Operational Policy 4.12: Involuntary Resettlement, 2001
- xi. Operational Policy (OP) 4.10 - Indigenous Peoples, 2005
- xii. Operational Policy (OP/BP) 4.11: Physical Cultural Resources, 2006
- xiii. Operation policy (Op/Bp) 4.36: Forestry
- xiv. World Bank Policy on Access to Information, 2010

After presenting the various laws that governed the ESIA, Dr. Ontita presented the various environmental and social impacts that would occur throughout the project cycle and provided the proposed mitigation measures. He explained that different impacts, both good and bad would occur during all phases of the project life cycle. These included, impacts during the planning phase, construction phase, operation phase and decommissioning phase. After presenting the various impacts of the project as well as the mitigation measures the Doctor concluded his presentation.

#### **v) Questions Observations and Answers**

The consultant then invited the participants to ask their questions as well as provide observations for inclusion in the report. The questions asked are as follows:

##### **a) Questions**

- 1) Kea saburi from likoni-stated that we were giving good words but there still was no water. He wanted to know where the problem was. Was the scarcity of water as a result of faulty pipes or poor designs or there just wasn't enough water available.
- 2) Shafi mwavumo from Bofu- asked how compensation would be carried out and if would the growing population (shelly beach and Maweni) also be served?
- 3) Rashid mwalizuma from likoni- thanked the team for carrying out the public consultations meetings. He asked if another line could be done to give Timbuani water large pipes
- 4) Locas njagi njeru from mtaawa mbuzi-asked what was the criteria for employment?
- 5) Abdulrahman Suleiman from Bofu-asked if the pipelines would be laid on both sides of the road.
- 6) Miriam hamadi from mrima-stated that they had been waiting for the project but it had never come, she wanted to know what was happening. She also proposed that the stakeholders be informed on the project
- 7) Mirianatumu said from zamzam- asked if the meters placed in the homestead were functional because MOWASCO kept taking estimates every month rather than the meter readings.
- 8) Mwanahawa bakari from Maweni- asked what would be done to ensure there was no cultural conflict between the indigenous population and the new workers that would come as a result of the project. He also asked if they would be confined to camps.
- 9) Ali muhamed wiga from shelly beach- asked if he would be compensated if his business was demolished because of the project and what about the land owner.
- 10) Gideon kai from shelly beach- wanted to know where the shelly beach line starts and ends. He also stated that some of the lines would affect many structures and wanted to know if the line could be rerouted to avoid big buildings. He also wanted to know if people would be allowed to build after, and if so what was the criteria and what committees would be formed.
- 11) Ali Omar samba from dudus- stated that the project had been accepted but said that they wanted to have a similar forum with the contractor so as to enlighten them on their culture so

as to avoid friction in the future. He also said that the project needed to reach the common mwananchi through smaller pipes. He also stated that there was need for committees which would work with the contractor to facilitate the contractor's ease of work.

**b) Answers**

- 1) Eng. Dr. Oonge stated that it was difficult to explain the lack of water in the area. He said that he would however relay the concerns back to coast water service board.
- 2) Eng. Dr. Oonge stated that there would be compensation for houses. He state that World Bank compensates even for illegal constructions. He also stated that there would be a line provided in this project and the supply being provided would be able to sustain the target population in 2030 which is way more than the current population.
- 3) Eng. Dr. Oonge stated told Mr. Rashid that they had noted his opinion down.
- 4) Eng. Dr. Oonge advised the people to use the administration to dictate employment terms and not politicians.
- 5) Eng. Dr. Oonge stated that the pipe would be on one side of the road and if there was need for crossing, an application would be made to the roads board.
- 6) Eng. Dr. Oonge stated that some meters were faulty and driven by air resulting to incorrect readings. He advised them to report those matters to MOWASCO.
- 7) Eng. Dr. Oonge told the stakeholders that it was difficult to control interactions between the newcomers and indigenous population however they would be HIV training carried out. He also stated that they could not confine the newcomers to their camps.
- 8) Eng. Dr. Oonge stated that land owners would also be compensated however coast region was unique, because of absentee landlords. He also stated that there would be compensation for structures.
- 9) Eng. Dr. Oonge stated that wayleave for the pipeline was 9m and many of the pipes would be placed on the road reserve he advised them to avoid encroaching on the road reserve. He also stated that coast water service board would pay for the structure, however the structure could not be put back once taken down. Only temporary structures could be put back. He also the only committees formed would the ones under NEMA.
- 10) Eng. Dr. Oonge stated that coast water service board was mandated to lay the big pipes which are to serve the whole area and MOWASCO WERE THE ONES RESPONSIBLE FOR tapping water from the big pipes into the small pipes which would serve the common mwananchi. He also stated that he had noted the suggestions made and would relay them to CWSB. He then went ahead to thank the people for all the suggestions and inform them that their views and observations had been noted

**vi) Conclusion**

Eng. Dr. Oonge then asked the participants if they were in support of the project, the participants were unanimous in their support of the project.

**vii) Vote of Thanks and Close of the Meeting**

The ass chief thanked the people for attending the meeting and closed with a word of prayer at 4.40pm

## 12.5 Appendix F: Photo Gallery

### 12.5.1 Photos of Project Area



Solid Waste in Kongowea Area



Water Vendor in the Project area



Garbage Collection Truck in Project Area



Solid Waste in Shanzu (north Mainland)

**12.5.2 Public Consultation Meetings Photos**

**i) Tudors chief camp–Mombasa Island**

The chief introducing the team to the stakeholders



The EIA Lead Expert making the presentation



A member of the public asking questions



Members of the public following the presentation



Members of the public showing their support for the project



Lead sociologist making presentations



**ii) St Mary's Catholic Hall-West Mainland**

The chief introducing the team to the stakeholders



The EIA Lead Expert making presentations



A member of the public asking questions



Members of the public following the presentation



Members of the public showing their support for the project



The EIA Lead sociologist making presentations





**iii) Frere Town CDF Hall-North Mainland**

Chief introducing the team to the stakeholders



The EIA lead expert making presentations



The lead sociologist making presentations



Members of the public following the presentations



Members of the public asking questions



Members of the public showing support for the project



**iv) Licodep Hall- South Mainland**

The EIA lead expert making presentations



Members of the public following the presentations



Lead sociologist giving presentations



Members of the public asking questions



Members of the public showing support of the project



