

REPUBLIC OF KENYA



MINISTRY OF WATER & IRRIGATION

COAST WATER SERVICES BOARD (CWSB)



**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT
FOR
NYALANI-MWAKIJEMBE-VIGURUNGANI-BANG'A WATER PROJECT
PHASE I**

Works carried out under

Contract No.: CWSB/WaSSIP-AF/C/25/2013

Report Prepared by:



Zamconsult Consulting Engineers

JULY 2016

ESIA EXECUTIVE SUMMARY

Background

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.

CWSB as part of its mandate intends to improve bulk water supply to Vigurungani, Puma and Ndavaya locations in Kinango Sub-County, Kwale County. This will be done through the following works:

- ❖ Construction of Nyalani Treatment Works
- ❖ Construction of 1.70 km - 8" diameter G.I pipeline.
- ❖ Construction of 38.35 km - 4" diameter uPVC pipeline.
- ❖ Construction of 20 VIP Latrines.
- ❖ Construction of 20 Standard Water Kiosks.
- ❖ Supply and installation of 20, 10m³ Plastic Tanks and appurtenances.
- ❖ Construction of 3 100m³ Ground Masonry Tanks.
- ❖ Construction of 2 225m³ Ground Masonry Tanks.
- ❖ Construction of 2 Pump houses.
- ❖ Supply, installation and testing of 2 Pumping sets.
- ❖ Fencing of the 2. Pumping stations.

The above activities will cost K.Shs. 198,758,788.80, however due to insufficient funds the project has been divided into phases. Phase I will be done in 4 (four) months and will cost K.Shs. 87,000,000 and includes the following works:

- ❖ Construction of Nyalani Treatment Works
- ❖ Construction of 1.70 km - 8" diameter G.I pipeline.
- ❖ Construction of 4" uPVC -10.1km Pipeline
- ❖ Construction of 5 V.I.P. Latrines
- ❖ Construction of 5 Standard Water Kiosks
- ❖ Supply and Installation of 5 No. 10 m³ each Plastic Tanks
- ❖ Construction of 3No. 225 M³ Sump Masonry
- ❖ Construction of 1No. 150 M³ Sump Masonry
- ❖ Construction of 1No. Pump house.
- ❖ Supply, Install & test pump 2 No. (for duty and standby) Pumping Units
- ❖ Fencing 1no. Pump house and 2 Storage tank compounds.

Zamconsult Consulting Engineers has been contracted to undertake the ESIA and RAP for the proposed augmentation works as part of the WaSSIP projects with funding from the World Bank.

Study Methods

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

Legislative Framework for this Study

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

Sectoral 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.

In addition to the local legislation, the Consultant identified the various World Bank operational policies relevant to the project. Some of these policies include Operational Policy (OP) 4.01, OP 4.04, OP 4.12, OP 4.10, OP 4.11 as well as the World Bank Policy on Access to Information, 2010.

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 such as valve chambers, washouts and water storage tanks and 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 utilized as much as possible. A detailed Resettlement Action Plan has been prepared for implementation by the client. The Resettlement Action Plan identified 199 PAPs would be affected by the proposed project. In order to mitigate the impact of the project on the PAPs a budget of K.Shs. 1,452,487.00 (one million four hundred and fifty two thousand, four hundred and eighty seven only) should be set aside to implement the RAP. If implemented in accordance with the laid down laws, guidelines and procedures and any arising grievances addressed as stipulated, the RAP would be adequate to clear the way leave for the proposed project.

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.

Environmental / Social Impact	Mitigation Action Plan	Responsibility
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	CWSB/KWAWAS CO/County government

Environmental / Social Impact	Mitigation Action Plan	Responsibility
	compensation to be done according to the prevailing market rates in the area.	
Loss of structures	As a first step, the owners, type of structures and businesses are identified. The compensation will be done at replacement cost.	CWSB/KWAWAS CO /County government
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	CWSB/KWAWAS CO/County government
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</p> <p>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>Contractor</p> <p>Supervising Engineer</p>

Environmental / Social Impact	Mitigation Action Plan	Responsibility
	<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>	
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 KWAWASCO
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>	Contractor Supervising Engineer KWAWASCO

Environmental / Social Impact	Mitigation Action Plan	Responsibility
	<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>	
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>	KWAWASCO 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>	The Contractor Supervising Engineer

Environmental / Social Impact	Mitigation Action Plan	Responsibility
	<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>	
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>	<p>The contractor</p> <p>The Supervising Engineer</p>
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.

Figure 1: Project location

The proposed project area is located in Nyalani, in Ndavaya and Vigurungani Locations within Kinango Sub-County as shown on the map below:

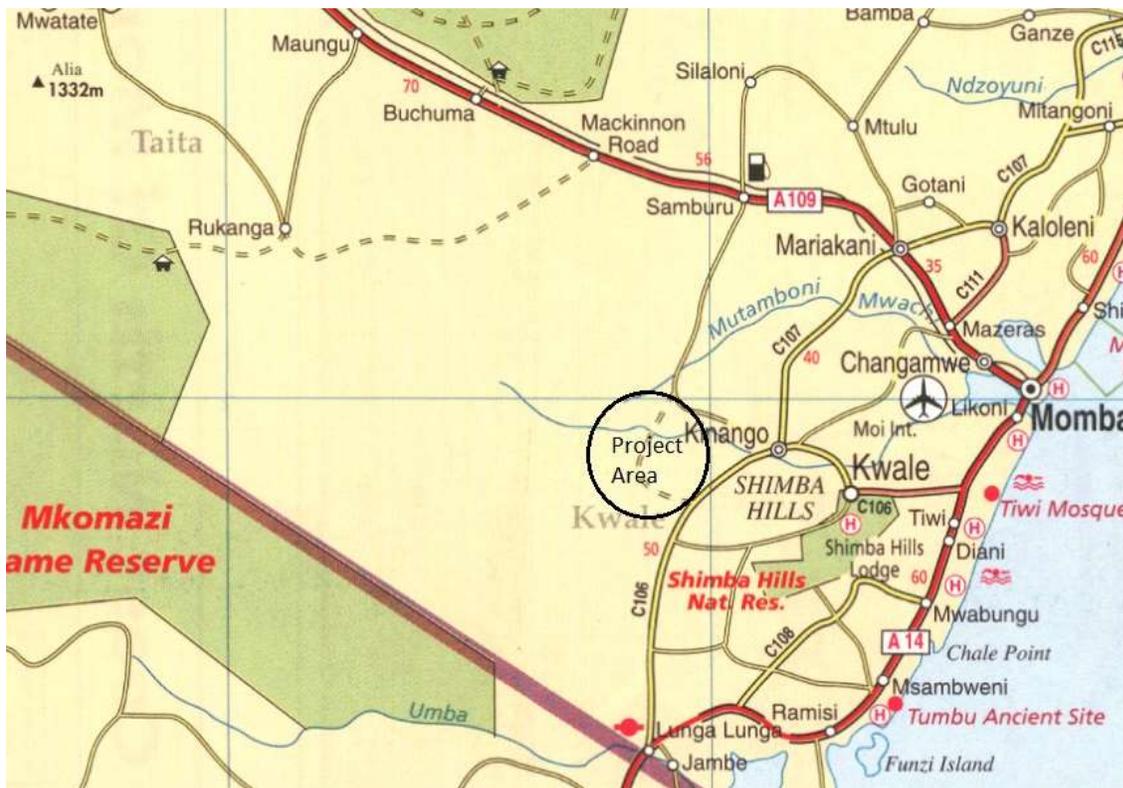


Table of Contents

1	INTRODUCTION	1-1
1.1	METHODOLOGY OF WORK	1-2
2	PROPOSED PROJECT DESCRIPTION AND ALTERNATIVES	2-1
2.1	LOCATION	2-1
2.2	THE BACKGROUND OF PROPOSED PROJECT.....	2-1
2.3	OBJECTIVES OF THE PROJECT	2-2
2.4	DESIGN COMPONENTS.....	2-3
2.5	ALTERNATIVES TO THE PROJECT.....	2-3
2.5.1	No Action Alternative.....	2-4
3	PHYSICAL, BIOLOGICAL AND SOCIAL BASELINE CONDITIONS OF AFFECTED ENVIRONMENT	3-1
3.1	ENVIRONMENTAL AND SOCIO-ECONOMIC SURVEY.....	3-1
3.1.1	Population dynamics and household characteristics.....	3-1
3.1.2	Water Supply	3-5
3.1.3	Environmental Situation	3-10
3.1.4	Health Status	3-12
3.1.5	Waste Management.....	3-17
3.1.6	The Project.....	3-18
3.2	PHYSIOGRAPHIC AND ENVIRONMENTAL CONDITIONS.....	3-21
3.2.1	Location	3-21
3.2.2	Topography.....	3-21
3.2.3	Climate.....	3-21
3.2.4	Drainage.....	3-22
3.2.5	Geology.....	3-22
3.3	SOCIO ECONOMIC INFRASTRUCTURE.....	3-22
3.3.1	Administration	3-22
3.3.2	Health Facilities	3-22
3.3.3	Transport and Communication	3-22
3.3.4	Commerce and Industry.....	3-22
3.3.5	Local Communities.....	3-24
4	RELEVANT LEGISLATIVE/ REGULATORY FRAMEWORK	4-1
4.1	THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT (EMCA)	4-1

4.2	THE ENVIRONMENT MANAGEMENT AND COORDINATION ACT (EMCA) 1999 AND ITS TOOLS.....	4-2
4.2.1	Environmental Impact Assessment and Audit Regulation 2003 (Legal Notice 101 of 2003)	4-3
4.2.2	The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2013 (Gazette Notice No. 13211 of 2013).....	4-3
4.2.3	Water Quality Regulations (2006).....	4-3
4.2.4	The Environmental Management and Coordination (waste management) Regulation, 2006	4-4
4.2.5	EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009....	4-4
4.2.6	Draft Environmental Management and Coordination (Air Quality) Regulations, 2008	4-5
4.3	WATER ACT 2002	4-5
4.4	THE PUBLIC HEALTH ACT (CAP. 242).....	4-6
4.5	THE LAND ACT, NO. 6 OF 2012	4-6
4.5.1	Land registration under land act, 2012	4-7
4.5.2	Way leaves under land act, 2012	4-8
4.5.3	Land acquisition under land acts 2012.....	4-8
4.6	THE CONSTITUTION OF KENYA 2010	4-10
4.6.1	Environmental obligations and rights	4-10
4.6.2	Classification of land	4-11
4.7	LEGAL FRAMEWORK OF THE GOK IN REGARD TO LAND OWNERSHIP AND TRANSACTIONS	4-12
4.7.1	Land Ownership in Kenya	4-12
4.7.2	Legal Provision Governing Voluntary Land Transactions in Kenya.....	4-13
4.7.3	Legal Provision for Involuntary Land Acquisition in Kenya	4-14
4.8	THE HIV AND AIDS PREVENTION AND CONTROL ACT	4-14
4.9	NATIONAL LEGAL PROVISIONS ON GENDER.....	4-18
4.9.1	National Gender and Development Policy (2000).....	4-19
4.9.2	The New Constitution of August 2010 on Gender	4-20
4.9.3	The Sexual Offences Act (NO 3 of 2006)	4-22
4.10	THE OCCUPATIONAL HEALTH AND SAFETY ACT, 2007	4-22
4.11	THE COUNTY GOVERNMENTS ACT, 2012	4-22
4.11.1	The Physical Planning Act (CAP 286) 2010	4-24
4.11.2	The Public Health Act (CAP. 242)	4-24
4.12	NATIONAL POLICY WITH DISTRICT DEVELOPMENT LINKAGES	4-25

4.12.1	National Poverty Eradication Plan (NPEP) 1999-2015	4-25
4.12.2	Vision 2030.....	4-25
4.12.3	Private sector development strategy 2006-2010.....	4-25
4.12.4	Kenya National HIV/AIDS Strategic Plan, KNASP 2005/06-2009/10.....	4-25
4.13	WORLD BANK SAFEGUARD POLICIES	4-26
4.13.1	Operational Policy (OP) 4.01: Environmental Assessment, 2001	4-26
4.13.2	Operational Policy 4.04: Natural Habitats, 2001	4-26
4.13.3	The Bank's Operational Policy 4.12: Involuntary Resettlement.....	4-26
4.13.4	Operational Policy (OP) 4.10 - Indigenous Peoples	4-27
4.13.5	Operational Policy (OP/BP) 4.11: Physical Cultural Resources	4-27
4.13.6	World Bank Policy on Access to Information, 2010	4-27
5	PUBLIC CONSULTATIONS	5-1
5.1	LEGAL REQUIREMENTS	5-1
5.1.1	Government Policy on Public Consultation.....	5-1
5.1.2	EIA and Audit Regulations.....	5-1
5.2	PERSONS OR AGENCIES CONSULTED	5-1
5.2.1	Overview from the Public Health Officer.....	5-2
5.2.2	Overview from the Coast Water Services Board Coordinator of Kinango Sub-County. 5-2	
5.2.3	Overview from the Sub-County Hospital Administrator.....	5-3
5.3	PUBLIC CONSULTATION.....	5-3
5.3.1	Findings of the meetings.....	5-3
6	ENVIRONMENTAL AND SOCIAL EFFECTS OF THE PROPOSED PROJECT.....	6-1
6.1	IMPACT CATEGORIES.....	6-5
6.2	IMPACTS EMANATING FROM THE PROPOSED PROJECT	6-5
6.2.1	Planning Phase Impacts	6-6
6.2.2	Construction Phase Impacts	6-6
6.2.3	Impacts during Operation & Maintenance.....	6-13
6.2.4	Impacts during De-commissioning.....	6-16
7	ENVIRONMENTAL MITIGATION COST ESTIMATES.....	7-1
8	ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT PLAN (ESMMP).....	8-1
8.1	POSSIBLE ENHANCEMENT MEASURES	8-1
8.2	MITIGATION MEASURES.....	8-1

9	ENVIRONMENTAL AND SOCIAL MONITORING PLAN.....	9-1
10	CONCLUSIONS AND RECOMMENDATIONS	10-1
11	REFERENCES	11-1
12	APPENDICES	12-1
12.1	APPENDIX A SURVEY QUESTIONNAIRE	12-1
12.2	MINUTES OF THE PUBLIC CONSULTATION MEETING HELD AT CHIEF’S OFFICE- MWAKIJEMBE ON 9 TH JUNE 2016 AT 12.30PM.....	12-5
12.2.1	List of Attendance.....	12-7
12.2.2	Public Consultation Meeting Photos.....	12-9

List of Tables

Table 5-1: Persons met during the ESIA study in planning the Proposed Water Supply Project	5-2
Table 6-1: Characterization of Impacts	6-2
Table 7-1: Cost Estimates for Environmental Mitigation	7-1
Table 8-1: The Proposed Environmental and Social Mitigation and Management Plan (ESMMP)	8-2
Table 9-1: Proposed Environmental Monitoring Plan	9-2

List of Figures

Figure 2-1: Map Showing the Location of the Project Area	2-1
Figure 2-2: Newly Rehabilitated Nyalani Dam	2-2
Figure 2-3: Schematic of proposed Project	2-3
Figure 3-1: Age Distribution of the Population	3-1
Figure 3-2: Household Literacy Level	3-2
Figure 3-3: Religion of the Population	3-2
Figure 3-4: Sources of Energy	3-3
Figure 3-5: Household Socio-Economic Activities	3-3
Figure 3-6: Business types in the project area	3-4
Figure 3-7: Household Income per Month	3-4
Figure 3-8: Type of Livestock	3-5
Figure 3-9: Main Sources of Water for the Community	3-5
Figure 3-10: Ownership Status of Water Sources	3-6
Figure 3-11: Percentage Population Paying for Water	3-6
Figure 3-12: General Status of the Water Quality	3-7
Figure 3-13: Adequacy of Water Supply	3-8
Figure 3-14: Fetching Water Frequency	3-8
Figure 3-15: Distance to Water Source	3-9
Figure 3-16: Common Modes of Transporting Water	3-9
Figure 3-17: Common Modes of Transporting Water	3-10
Figure 3-18: Environmental Issues of Concern	3-11
Figure 3-19: Environmental Conservation Initiatives	3-11
Figure 3-20: Implementers of Environmental Conservation Initiative	3-12
Figure 3-21: Will the Water Supply Project help in conserving the Environment	3-12
Figure 3-22: Prevalence of Diseases in the Area	3-13
Figure 3-23: Type of Treatment	3-13
Figure 3-24: Ownership Status of the Health Facilities	3-14
Figure 3-25: Distance to the Health Facilities	3-14
Figure 3-26: Level of Awareness on HIV/AIDS	3-15
Figure 3-27: Source of information on HIV/AIDS	3-15
Figure 3-28: Household Members affected by HIV/AIDS	3-16
Figure 3-29: Knowledge on whether HIV/AIDS can be prevented	3-16
Figure 3-30: Respondents who know where to go to for Voluntary HIV/AIDS Testing	3-17
Figure 3-31: Common Waste Disposal Methods	3-17
Figure 3-32: Respondents Who Have Toilets in Their Compound	3-18

Figure 3-33: Types of Toilets Respondents Have in Their Compound	3-18
Figure 3-34: Public Awareness of the Intended Construction of the Pipeline.....	3-19
Figure 3-35: Perceived Impact of the Water Supply Project	3-19
Figure 3-36: Positive Impact of the Proposed Project	3-20
Figure 3-37: Negative Impact of the Proposed Project.....	3-20
Figure 3-38: How to Mitigate Adverse Impact of the Project	3-21
Figure 3-39: Agriculture being practiced in the project area	3-23
Figure 5-12-1: Public Consultation Meeting List of Attendance.....	12-8
Figure 12-2: The consultant's presentation during the meeting.....	12-9
Figure 12-3: CWSB representative addressing Participants	12-9
Figure 12-4: Stakeholder Feedback during Meeting	12-10
Figure 12-5: Stakeholder Feedback during Meeting	12-10
Figure 12-6: Stakeholder Feedback during Meeting	12-11
Figure 12-7: Stakeholders showing their support of the Project.....	12-11

ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
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
GoK	Government of Kenya
GHG	Greenhouse Gases
HIV	Human Immunodeficiency Virus
ID No.	Identity Card Number
KAPP	Kenya Agricultural Productivity
K.Shs.	Kenya Shillings
KFS	Kenya Forestry Service
KWS	Kenya Wildlife Service
MDG	Millennium Development Goals
CWSB	Coast Water Services Board
KWAWASCOK	Kwale Water and Sewerage Company
MWI	Ministry of Environment Water and Irrigation
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NMK	National Museums of Kenya
NPEP	National Poverty Eradication Plan
O&M	Operation and Maintenance
PAP	Project Affected Person
PEC	Poverty Eradication Commission
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
WSSD	World Summit for the Social Development
m ³	cubic metres
VOCs	Volatile Organic Compounds
CH ₄	Methane
CO ₂	Carbon Dioxide
IC	Individual Service Connection
NC	Communal Service Connection
WTP	Water Treatment Plant
Mbgl	metres below ground level

1 INTRODUCTION

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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 (KWAWASCO), 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.

CWSB as part of its mandate intends to improve bulk water supply to Vigurungani, Puma and Ndavaya locations in Kinango Sub-County, Kwale County. This will be done through the following works:

- ❖ Construction of Nyalani Treatment Works
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- ❖ Construction of 1.70 km - 8" diameter G.I pipeline.
- ❖ Construction of 4" uPVC -10.1km Pipeline
- ❖ Construction of 5 V.I.P. Latrines
- ❖ Construction of 5 Standard Water Kiosks
- ❖ Supply and Installation of 5 No. 10 m³ each Plastic Tanks

- ❖ Construction of 3No. 225 M³ Sump Masonry
- ❖ Construction of 1No. 150 M³ Sump Masonry
- ❖ Construction of 1No. Pump house.
- ❖ Supply, Install & test pump 2 No. (for duty and standby) Pumping Units
- ❖ Fencing 1no. Pump house and 2 Storage tank compounds.

Phase 2 will include the rest of the works under the entire contract.

This report covers the activities of Phase I of the project which will be funded by the World Bank under Contract CWSB/WaSSIP-AF/C/25/2013, for which Zamconsult Consulting Engineers has been contracted to undertake the ESIA and RAP.

1.1 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. 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. An in-depth desk study, field observation, and wide consultation with stakeholders, key informant interviews and structured socio-economic interviews were carried out so as to obtain the requisite data and information on the following themes:

- Human Environment including; Socio-economic, Socio-cultural and Socio-legal
- Natural Environment including; Flora, Fauna, Soil, Water, Air, Climate and Landscape
- Built environment including; Material Assets, Historical /Archaeological Sites and Monuments
- Aesthetic Environment, and
- Archaeological Environment

The consultant used the available information to derive or predict or assess impacts and classify them under human, natural and built environment at pre-construction stage, Construction Stage and Operation stage of each project sub-component.

Any negative impact was widely assessed and the most suitable mitigation measure apportioned as a solution to the problem. Positive impacts were noted as such and further reinforced by statements of actions that enhance their productivity and sustainability in the development process during and after the implementation of the project.

ESIA was done for all the stages of the project including mobilization, site clearing and other pre-construction activities, construction, operation and maintenance and monitoring phases of the project components.

2 PROPOSED PROJECT DESCRIPTION AND ALTERNATIVES

2.1 LOCATION

The proposed project area is located in Nyalani, in Ndavaya and Vigurungani Locations within Kinango Sub-County as shown on the map below:

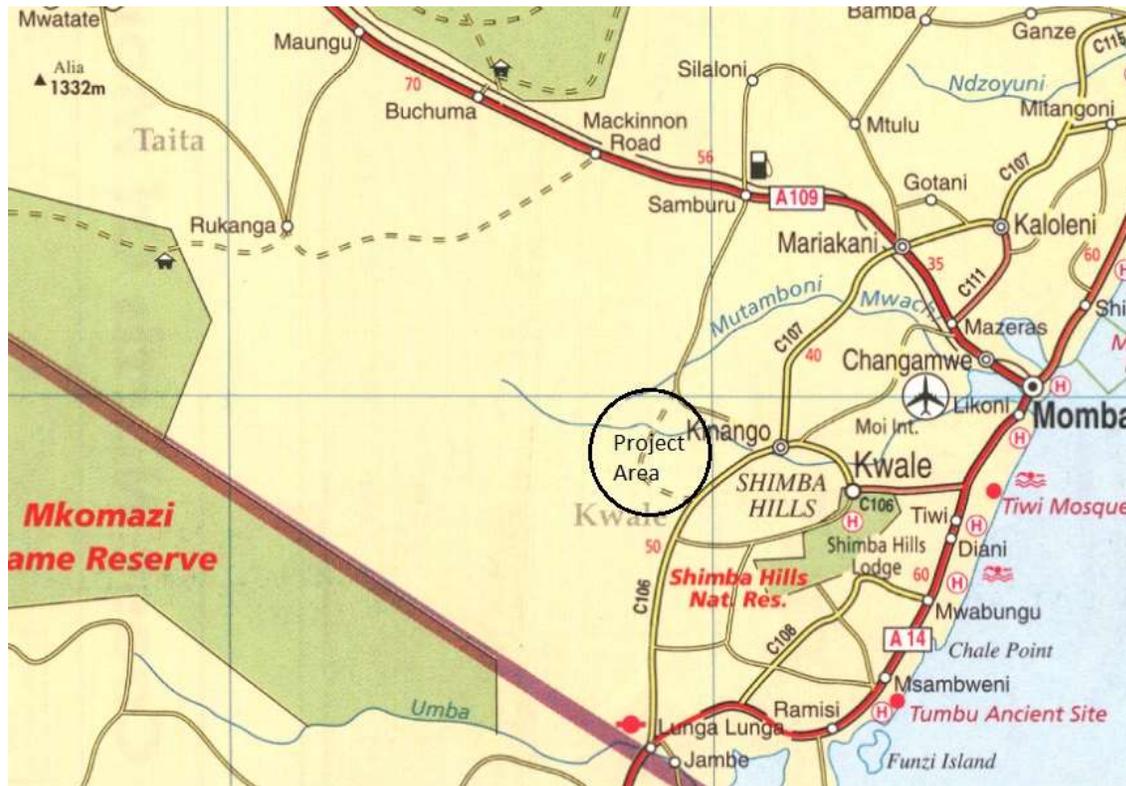


Figure 2-1: Map Showing the Location of the Project Area

2.2 THE BACKGROUND OF PROPOSED PROJECT

The Nyalani and Mwakijembe areas are arid and communities are forced to travel long distances in search of water. The project intends to draw water from the newly rehabilitated Nyalani Dam which was rehabilitated through the combined effort of the Red Cross and M-pesa Foundation. The dam intends to improve the food security in the area by providing water for irrigation. CWSB intends to also use the water from the dam for human and domestic animal consumption. The Nyalani Dam and reservoir is shown in the figure below:



Figure 2-2: Newly Rehabilitated Nyalani Dam

The residents of Nyalani currently rely on surface water for their source of water, and considering that the area is arid, makes water scarcity common in the area forcing residents, particularly women and children, to travel up to 15Km in search of water.

The residents of Vigurungani are currently served by the 44Km long Samburu – Vigurungani Pipeline, however this water is not adequate to serve the people of Nyalani, Mwakijembe and Mafundani.

2.3 OBJECTIVES OF THE PROJECT

The proposed project will have the following objectives:

- a) To provide adequate, reliable and safe water supply to the community and institutions in the area.
- b) Reduce time and distance taken in search for water from 15 km to 2 km.
- c) To improve the socio-economic of the community thereby reducing the high poverty index in the area.
- d) Improved education index to schools in the area as children will be able to concentrate to studies.

- e) To minimize human-wildlife conflict competing for water in the few earth pans in the project area.
- f) To improve the sanitation and the general hygiene standards of the community through construction of V.I.P. latrines and Participatory Hygiene and Sanitation Transformation.
- g) To transfer operation, maintenance and management skills to the water managing committees.

2.4 DESIGN COMPONENTS

The project will be made up of the following components:

- ❖ A fully functional Water Treatment Works
- ❖ A 1.70 km - 8" diameter G.I pipeline.
- ❖ A 4" uPVC -10.1km Pipeline
- ❖ 5 V.I.P. Latrines
- ❖ 5 Standard Water Kiosks
- ❖ 5 No. 10 m³ each Plastic Tanks
- ❖ 3No. 225 m³ Sump Masonry
- ❖ 1No. 150 m³ Sump Masonry
- ❖ 1 Pump house and pumping units
- ❖ Fencing around the pump house and storage tanks

The Schematic of the proposed works is shown in the figure below:

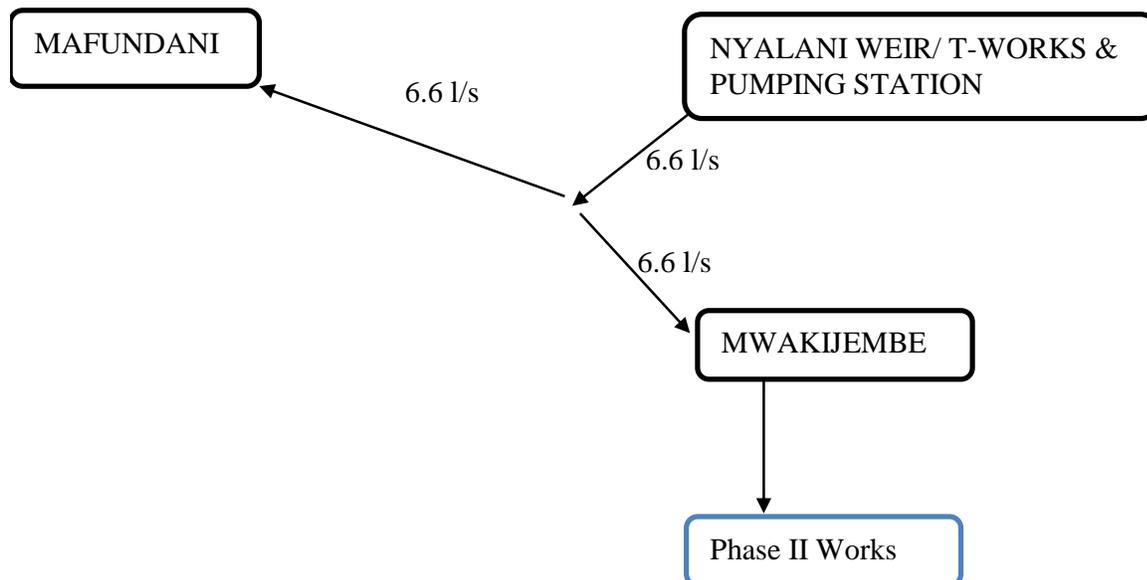


Figure 2-3: Schematic of proposed Project

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 Project. This alternative includes CWSB not carrying out the works leaving the locals depending on travelling long distances to access clean water as well as depend on unhygienic water sources.

The provision of clean and safe water will greatly improve the lives of the residents within the project area since the available water sources cannot cater for the needs of the population. In addition, the safe water will vastly reduce the prevalent waterborne diseases within the area hence improving the overall health and wellbeing of residents. Finally, the distance travelled in order to access water will be greatly reduced hence reducing the fatigue experienced by the residents in accessing water. It will also better their livelihoods as the time used to fetch water can be applied in other meaningful activities.

3 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.

3.1 ENVIRONMENTAL AND SOCIO-ECONOMIC SURVEY

The socio-economic situation of the area was captured based on findings of a household survey carried out using a structured questionnaire. A sample group of 200 households was interviewed for purposes of the analysis.

3.1.1 Population dynamics and household characteristics

The average household size is 7 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.

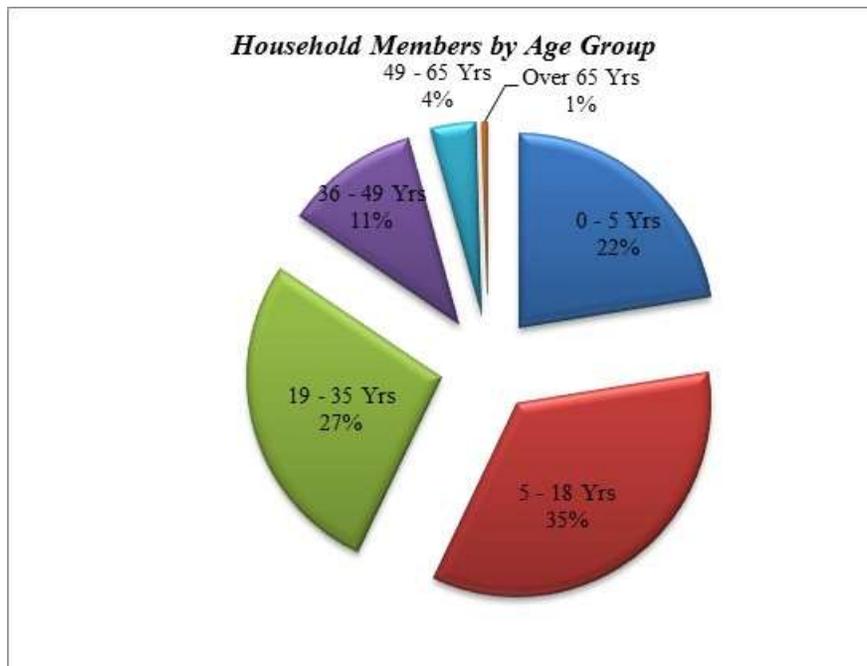


Figure 3-1: Age Distribution of the Population

Source: Survey data.

Literacy levels were as follows:- Primary level 54%, Secondary level 8%, college /university 2% and no education at all 36%. Therefore 64% of the population are able to read and write.

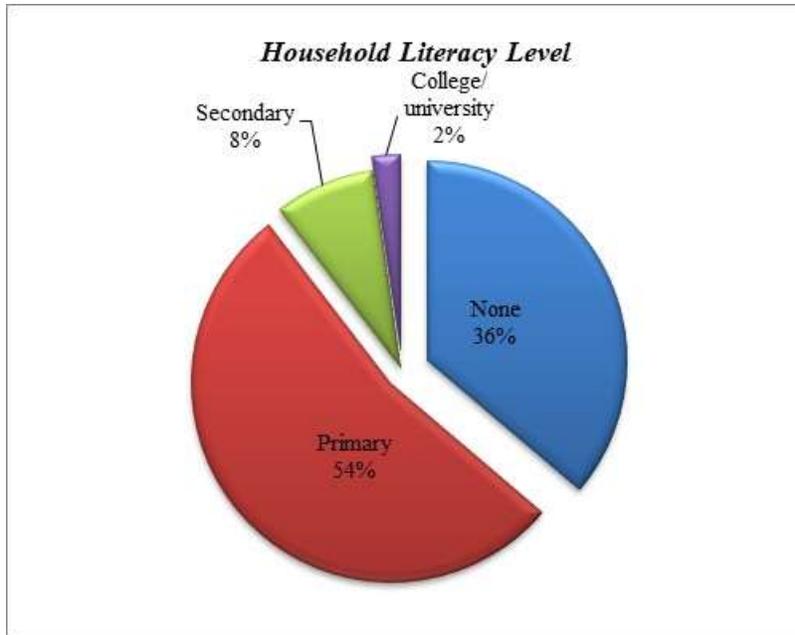


Figure 3-2: Household Literacy Level

Source: Survey data.

Both Christianity and Islam have a similar mass of followers with 37% and 44% of the population professing the faiths respectively.

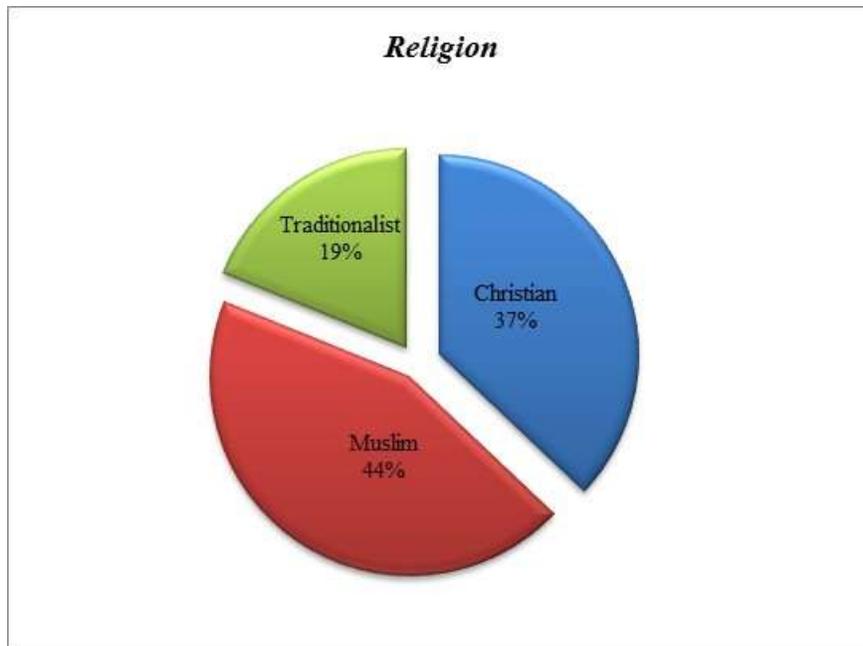


Figure 3-3: Religion of the Population

Source: Survey data.

Firewood is the main source of energy used by the community with 87% of the population depending on it. Charcoal is the main source of energy for the community. 12% of the population use charcoal while the rest either use kerosene stoves.

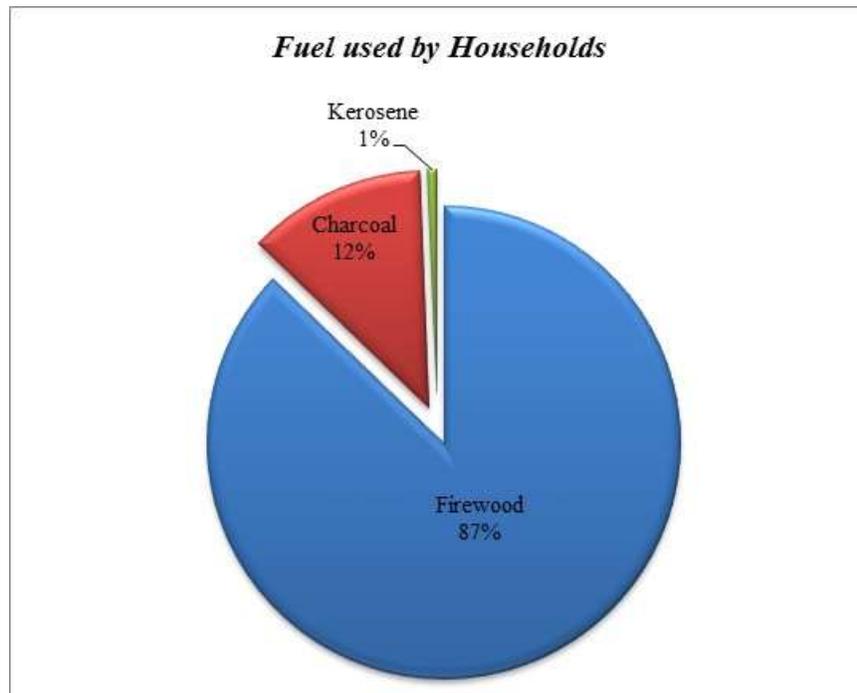


Figure 3-4: Sources of Energy

Source: Survey data.

The main socio-economic activities are crop and livestock farming, comprising of 84% of the population. Businesses comprise of 10% of the population while informal employment comprises of 5%. The least common economic activity is formal employment comprising of less than 1% of the population.

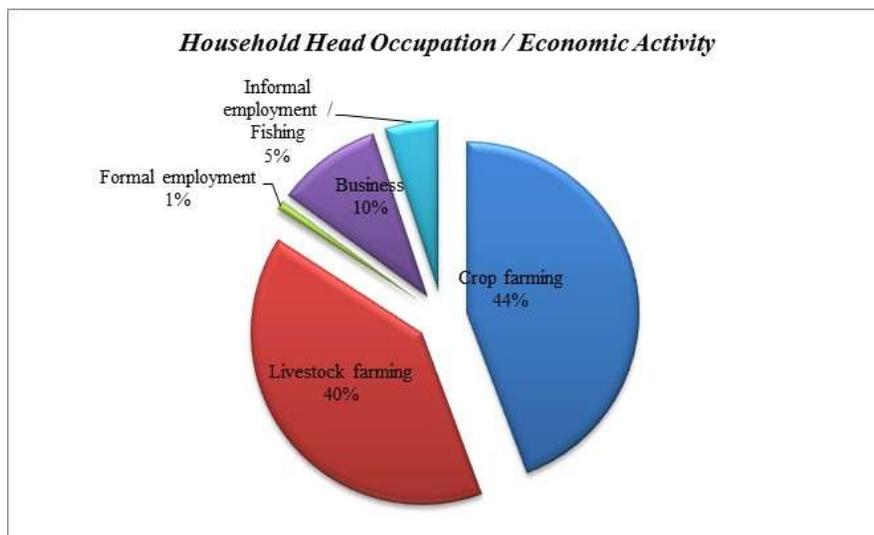


Figure 3-5: Household Socio-Economic Activities

Source: Survey data.

The household conducting business constitutes 10% of the total population. The most popular business in the area is the Jua Kali industry comprising of 52 % of the entreprising population. 27% of the entreprising population have shops while 9% sell groceries. The Bodaboda business is quite popular with 12% of the entreprising population depending on it.

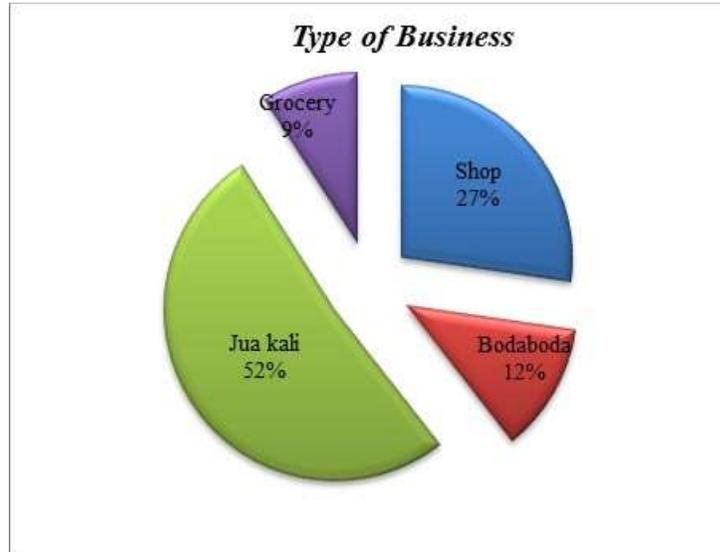


Figure 3-6: Business types in the project area

Most of the populations’ income for those who are formally employed lies under 15000. Only 8% of the population receive an income of over 30,000 shillings per month.

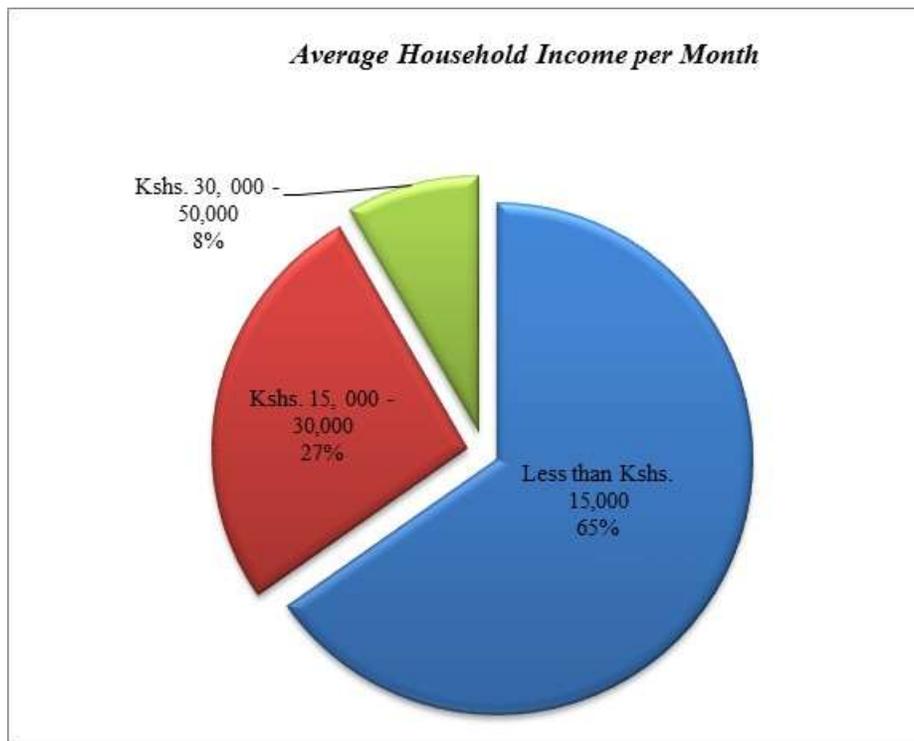


Figure 3-7: Household Income per Month

Source: Survey data.

40% of the households own livestock. The main livestock reared are goats as 51% of the population own them. 26% and 21% of the population own cattle and sheep respectively.

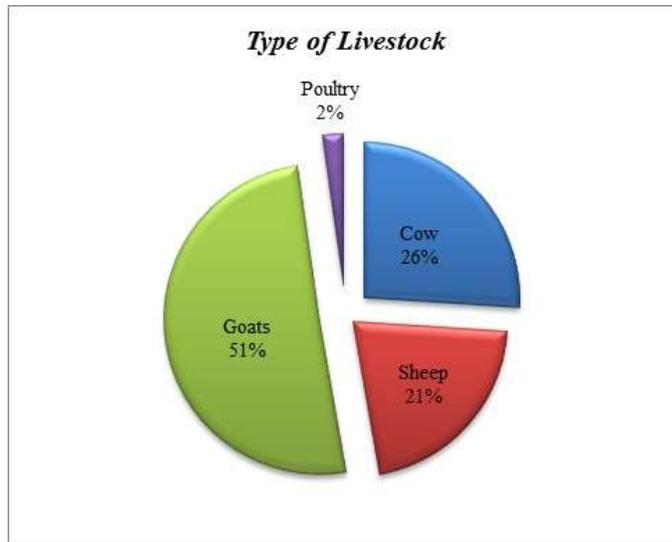


Figure 3-8: Type of Livestock

Source: Survey data.

3.1.2 Water Supply

The area is extremely dry and water pans offer the commonest source of water. The only other source of water that serves a paltry 19% of the population is the Nyalani dam.

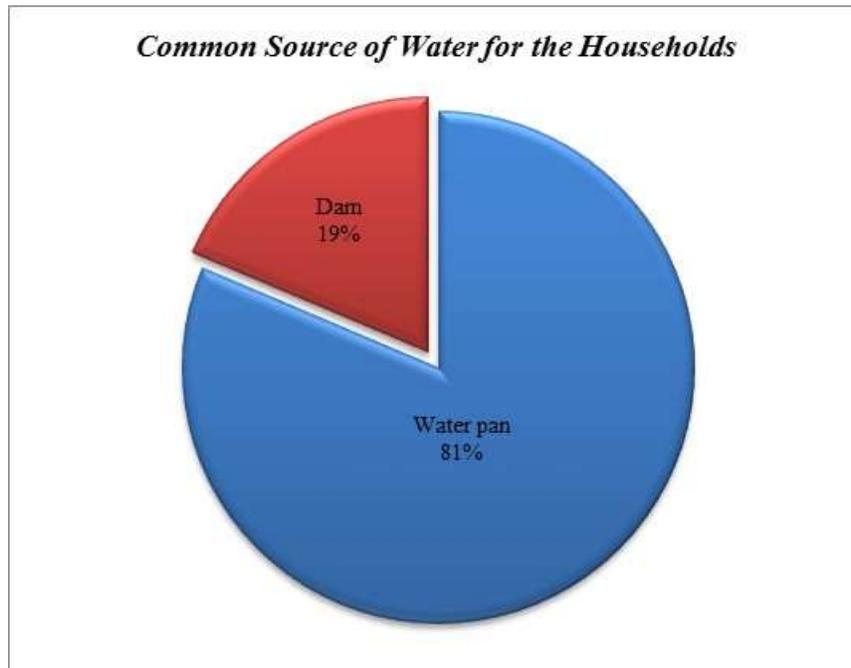


Figure 3-9: Main Sources of Water for the Community

Source: Survey data.

Most of the water providing companies are publicly owned, at 39%. Community based organizations, NGOs, faith based institutions and the private sector have minor shares with 18%, 16%, 14% and 13% respectively.

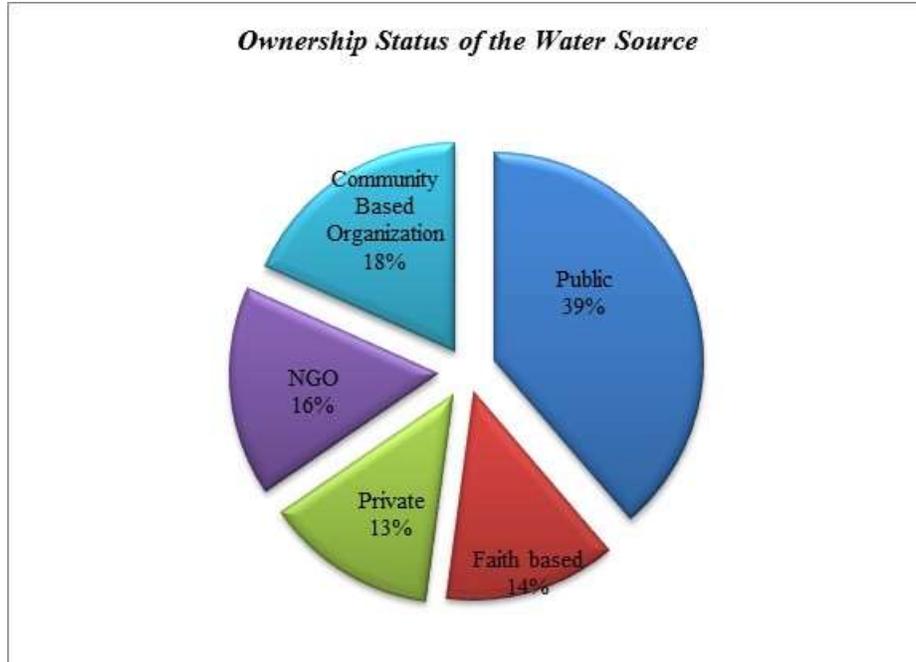


Figure 3-10: Ownership Status of Water Sources

Source: Survey data.

Where the population pays for water, it is generally costly at over Kshs. 10. Only in a few instances does water cost around Kshs. 10. Only 5% of the population pays for water.

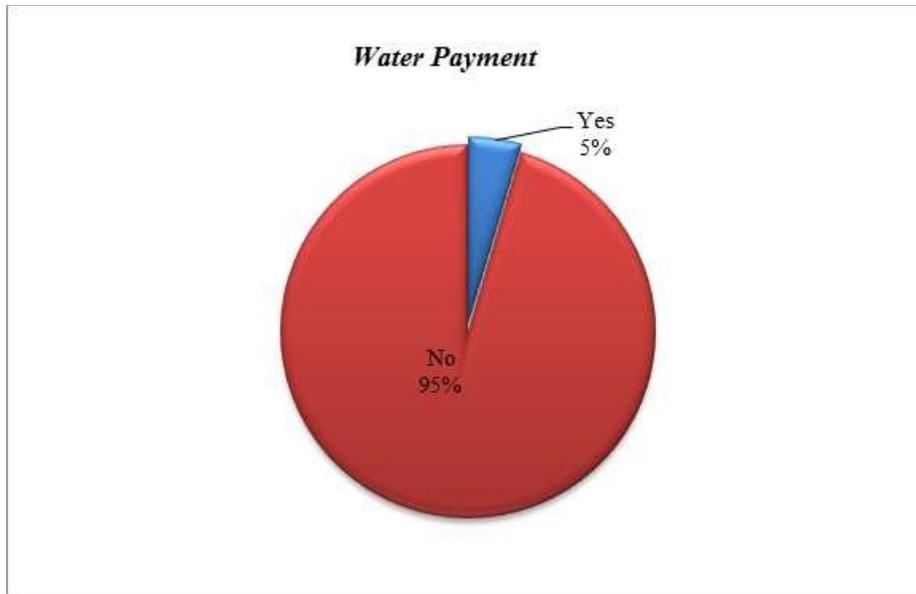


Figure 3-11: Percentage Population Paying for Water

Source: Survey data.

The water quality is generally fair with 97% of the respondents backing it up. Only 1% of the respondents find the water to be good while 2% find it to be bad.

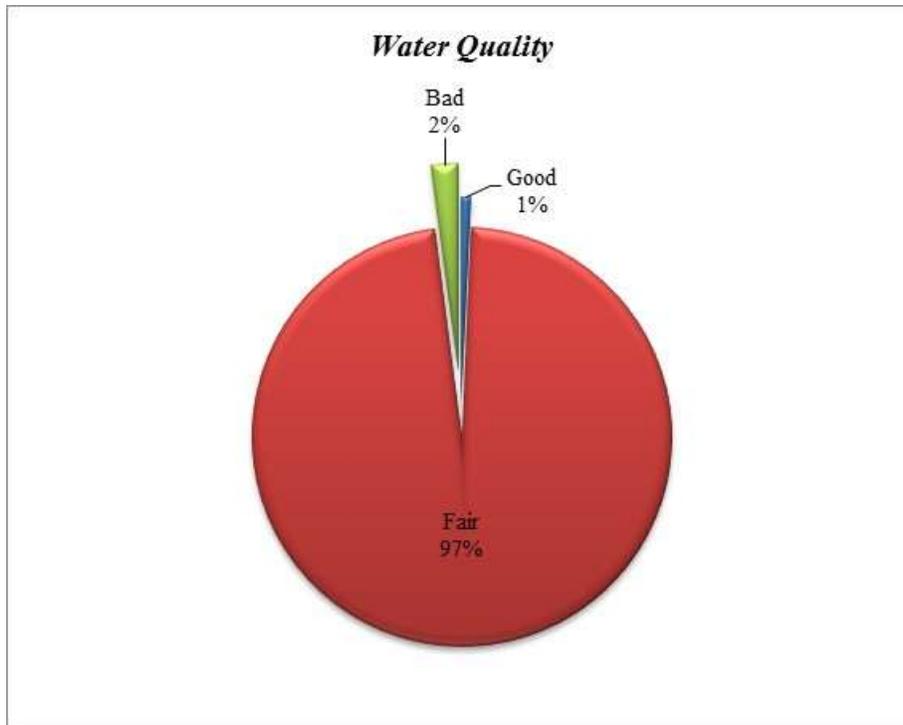


Figure 3-12: General Status of the Water Quality

Source: Survey data.

In most cases the existing water supply is not enough to meet the needs of all the people. 86% of the population felt that the water being currently provided wasn't adequate whereas the remaining 14% were being adequately supplied.

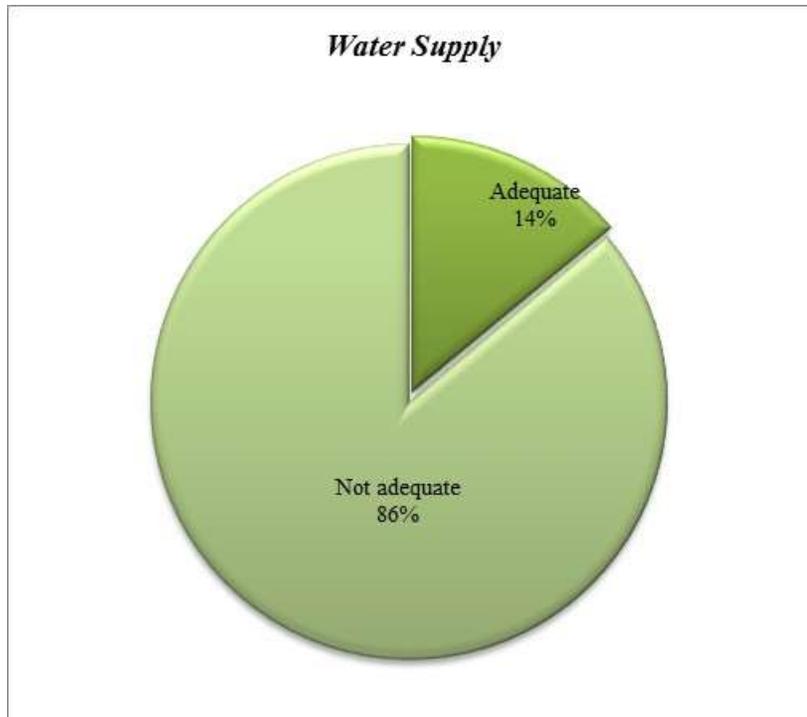


Figure 3-13: Adequacy of Water Supply

Source: Survey Data

95% of the population fetch water every day of the week, while 5% fetch it every alternate day of the week.

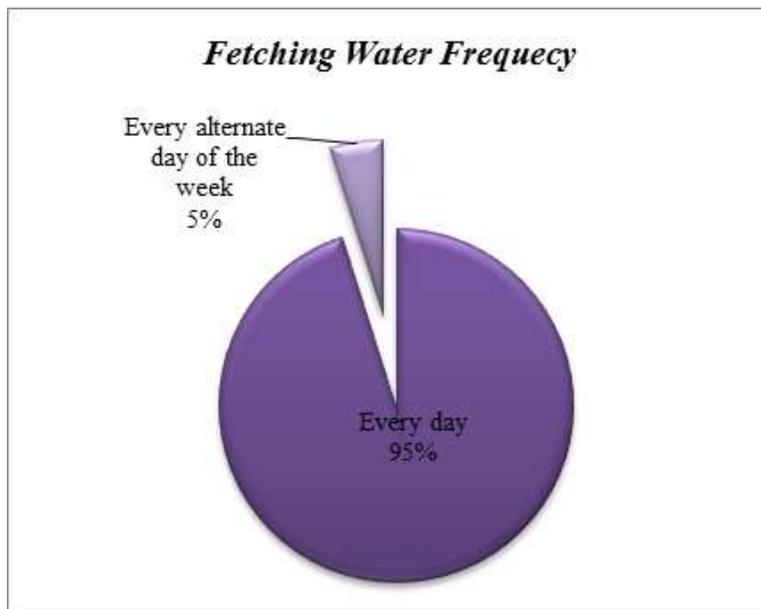


Figure 3-14: Fetching Water Frequency

Source: Survey data.

10% of the population walks for less than 0.2 km to the water fetching points; 25% walks for 0.2-1 km, 32% walks for 1-2km while 33% walk for more than 2 km to the water source.

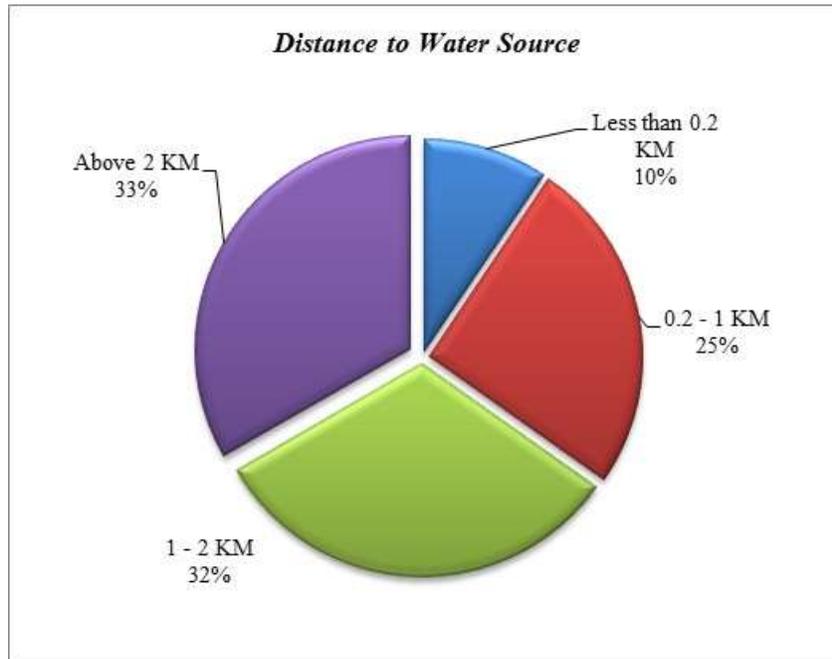


Figure 3-15: Distance to Water Source

Source: Survey data.

74% of the respondents transport water by carrying on the head. The rest of the population transport water via the use of Bodaboda bicycles and motor cycles.

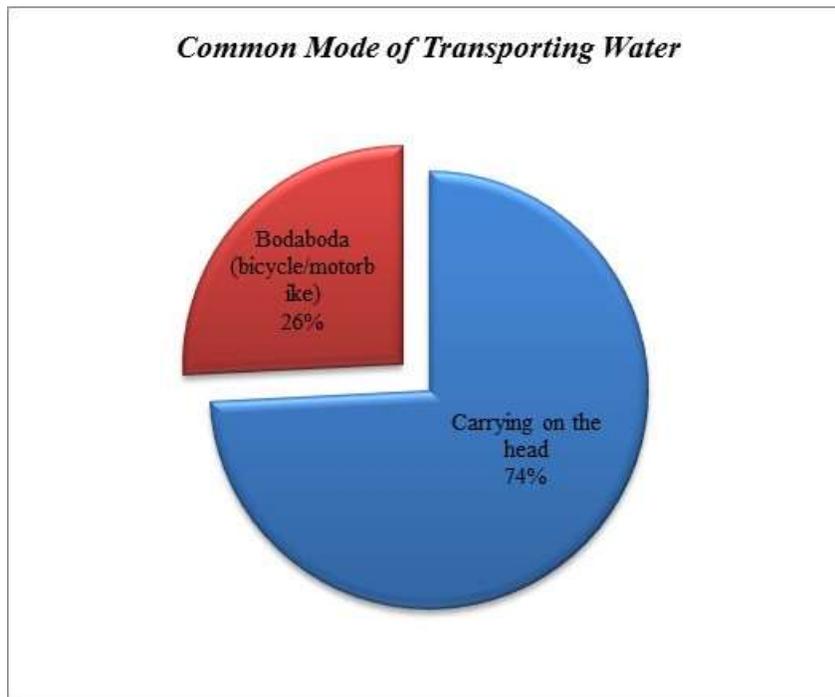


Figure 3-16: Common Modes of Transporting Water

Source: Survey data.

The most common challenge faced in transporting water is physical fatigue due to travelling long distances represented by 54% of the respondents. Loss of time accounts for 46% of the total challenges experienced in transporting water.

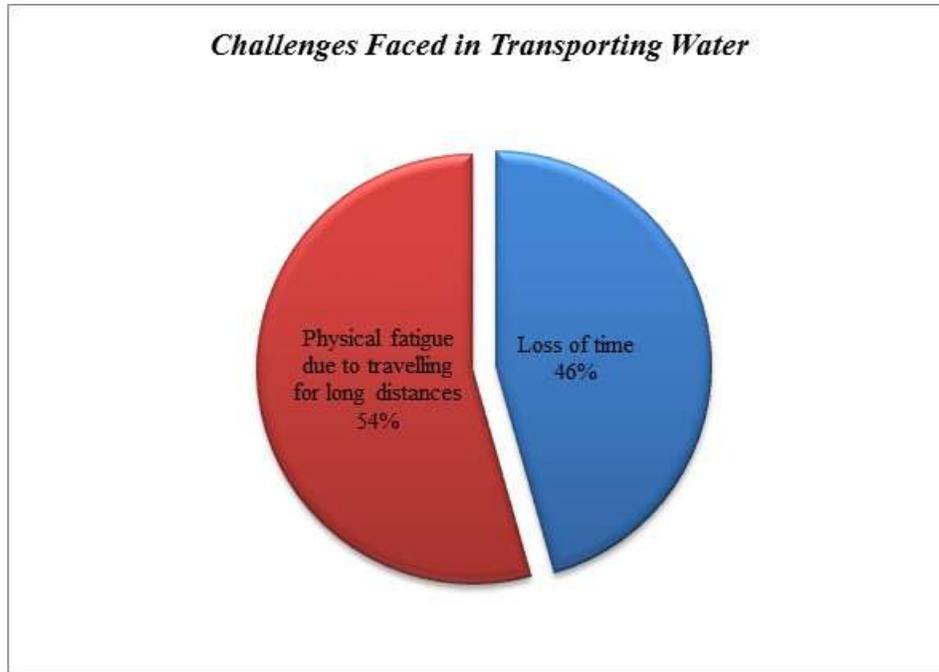


Figure 3-17: Common Modes of Transporting Water

Source: Survey data.

3.1.3 Environmental Situation

The environmental concerns in the area include water shortage, invasive species, extinction of endangered species such as the endangered *Mnondo* forest tree within Kwale district including the project region, mosquitos and malaria spread, overgrazing, deforestation, drought, as well as solid wastes due to project construction activities.

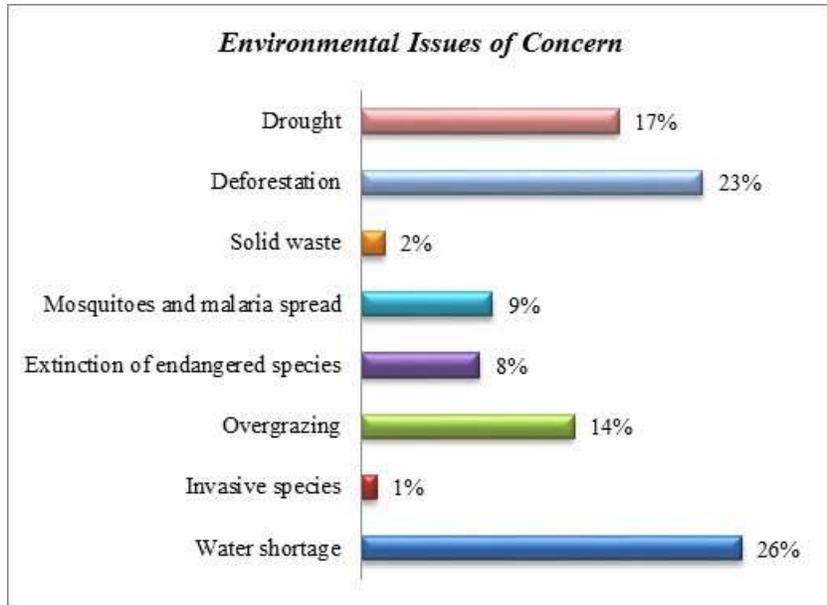


Figure 3-18: Environmental Issues of Concern

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 and others such as collection of solid wastes.

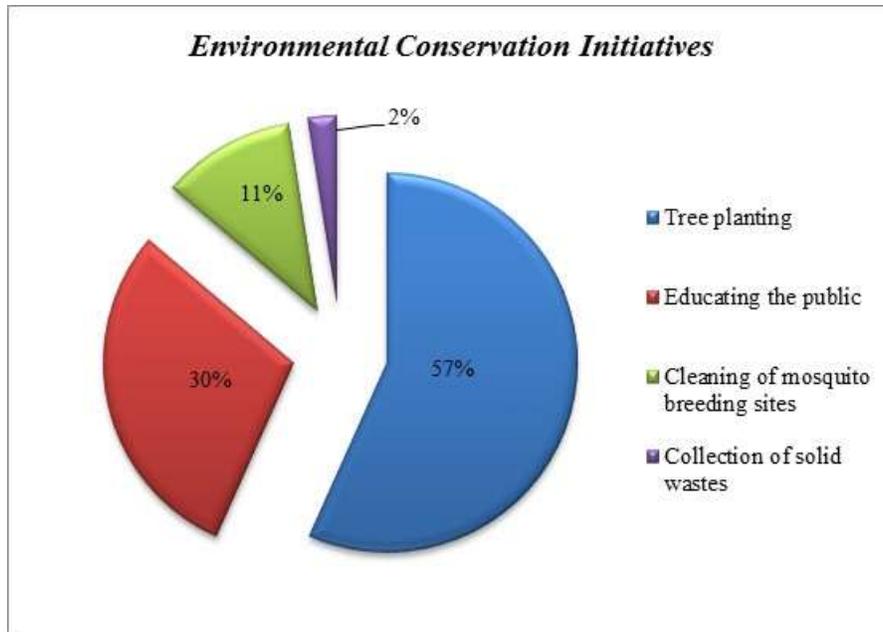


Figure 3-19: Environmental Conservation Initiatives

Source: Survey data.

These activities are carried out by youth groups, women groups, NGOs, CBOs, and the County Council.

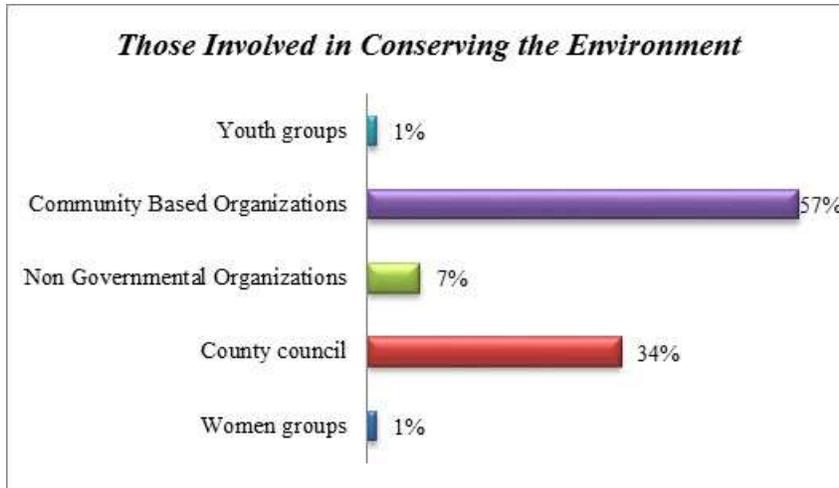


Figure 3-20: Implementers of Environmental Conservation Initiative

Source: Survey data.

97% of the population feel that the project will help conserve the environment while only 3% feel that it will not.

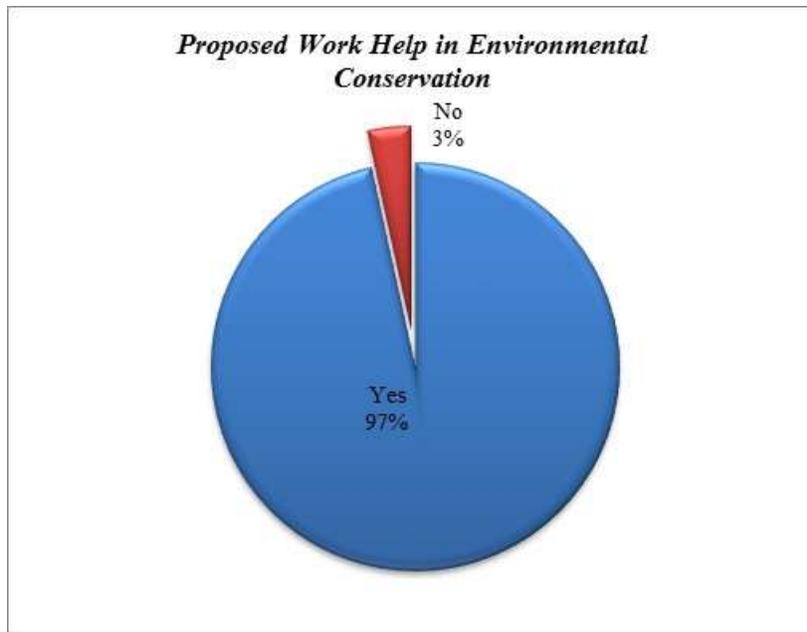


Figure 3-21: Will the Water Supply Project help in conserving the Environment

Source: Survey data.

3.1.4 Health Status

The prevalent diseases in the area are malaria, diarrhea, eye problems, skin rashes cholera, respiratory infections, intestinal worms, measles and malnutrition.

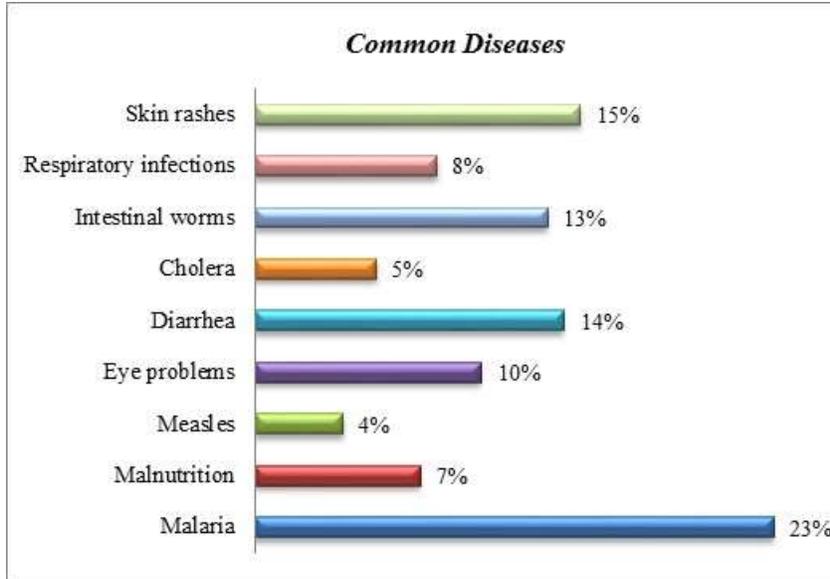


Figure 3-22: Prevalence of Diseases in the Area

Source: Survey data.

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

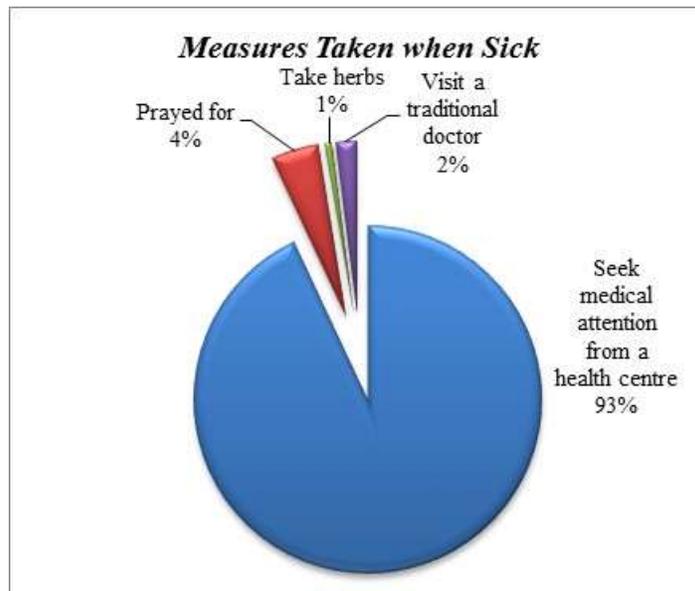


Figure 3-23: Type of Treatment

Source: Survey data.

The health facilities sought by the local population are mainly government health centres.

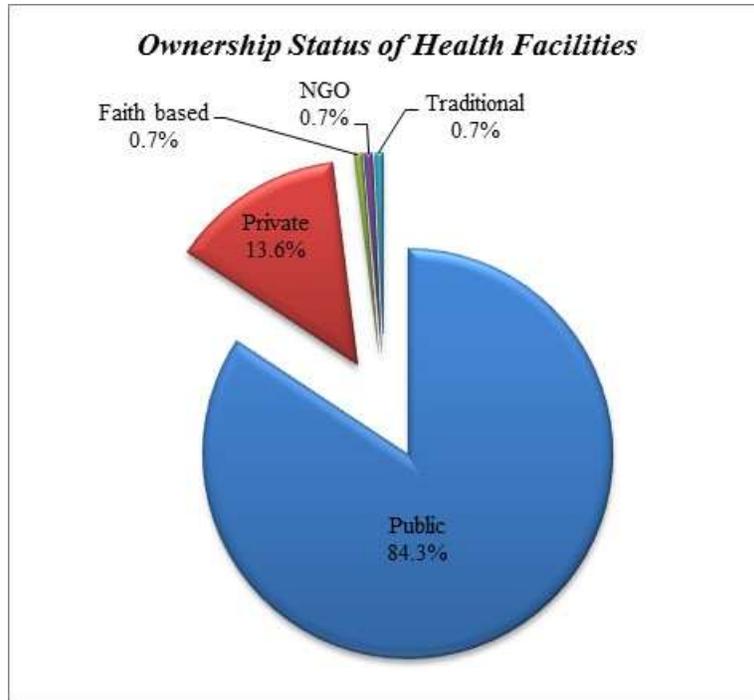


Figure 3-24: Ownership Status of the Health Facilities.

Source: Survey data.

58% of the respondents walk for above 5km to the health facilities, 27% walk for 3-5 km, 7% for 1-3km, while 8% walk for less than 1km.

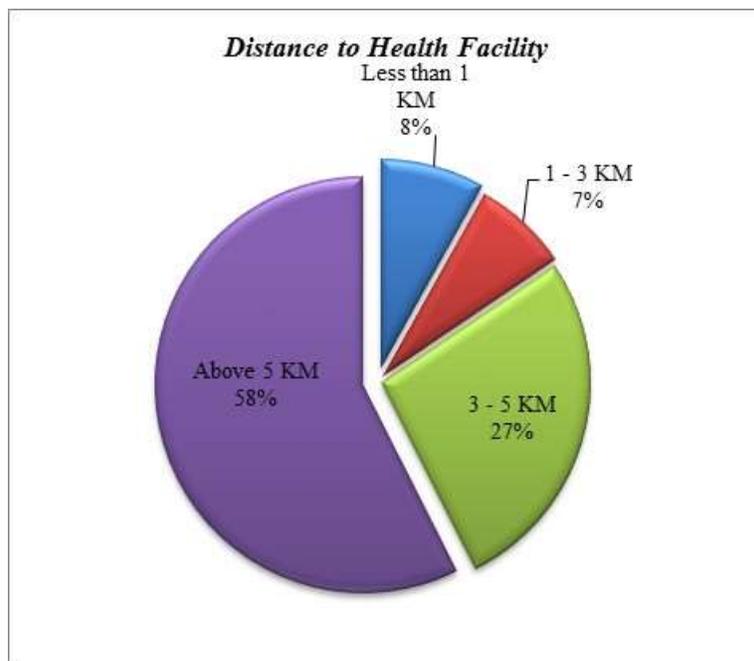


Figure 3-25: Distance to the Health Facilities.

Source: Survey data.

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

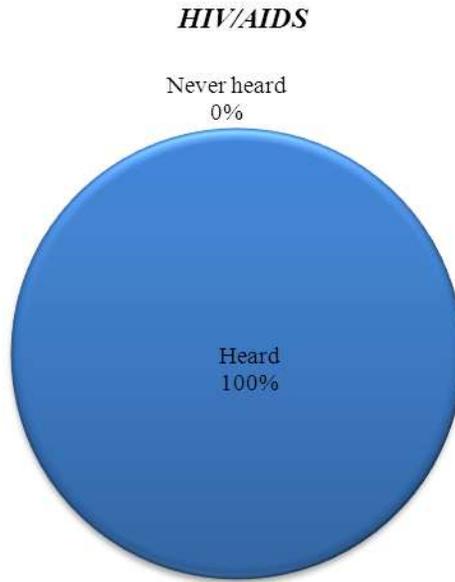


Figure 3-26: Level of Awareness on HIV/AIDS

Source: Survey data.

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

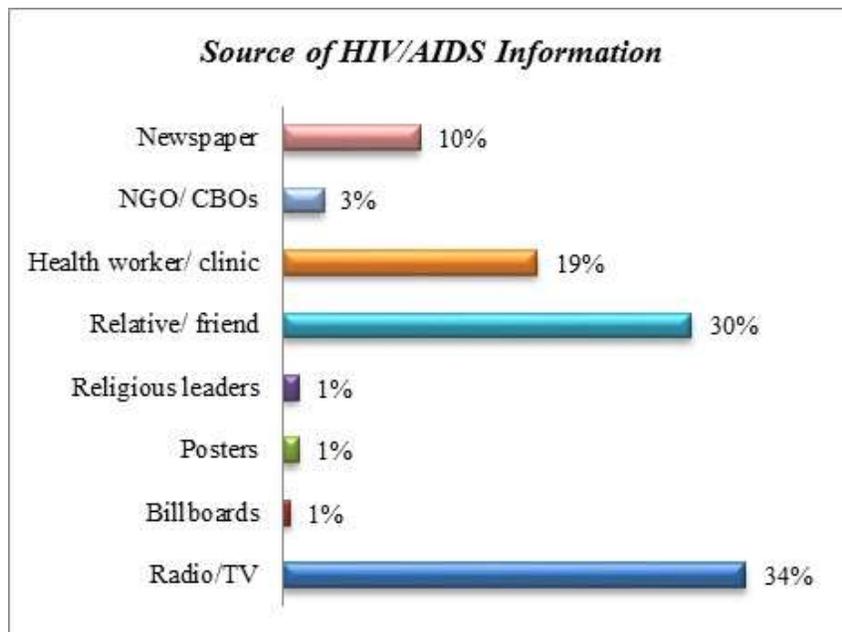


Figure 3-27: Source of information on HIV/AIDS

Source: Survey data.

3% of the respondents have been affected by the disease whereas 97% hadn't been affected by Aids.

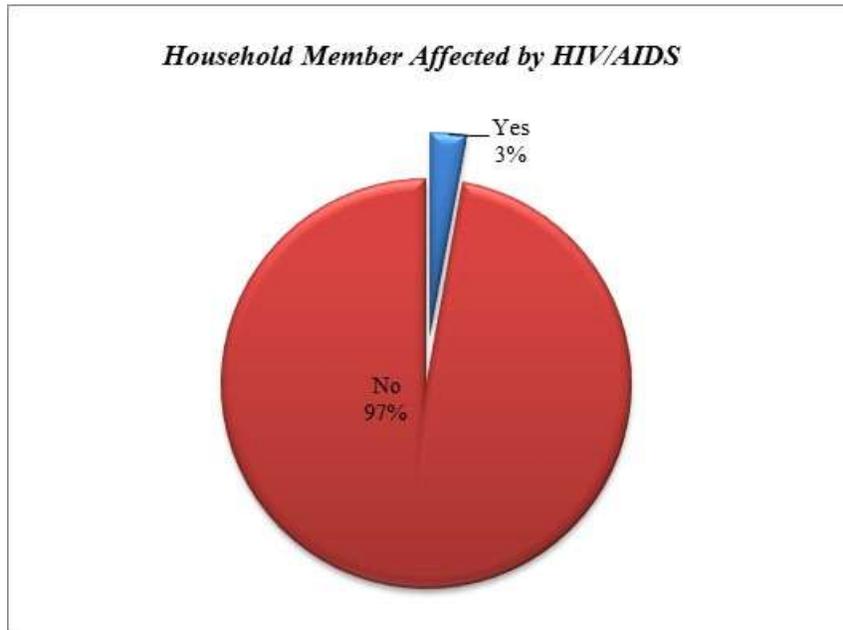


Figure 3-28: Household Members affected by HIV/AIDS

Source: Survey data.

88% of the respondents feel that HIV/AIDS can be prevented while an equal share of 6% says it cannot be prevented and don't know respectively.

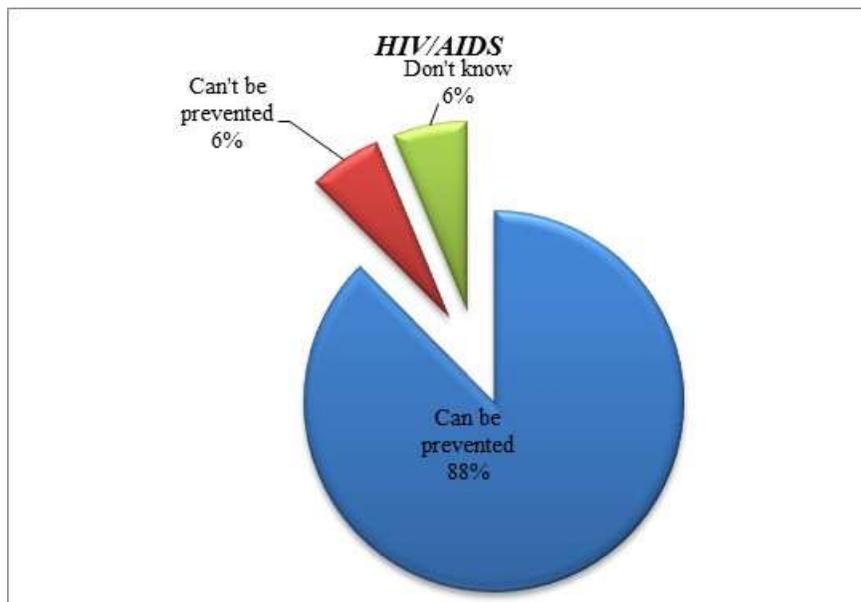


Figure 3-29: Knowledge on whether HIV/AIDS can be prevented

Source: Survey data.

94% of the respondents know where to go for voluntary counselling and testing for HIV/AIDS.

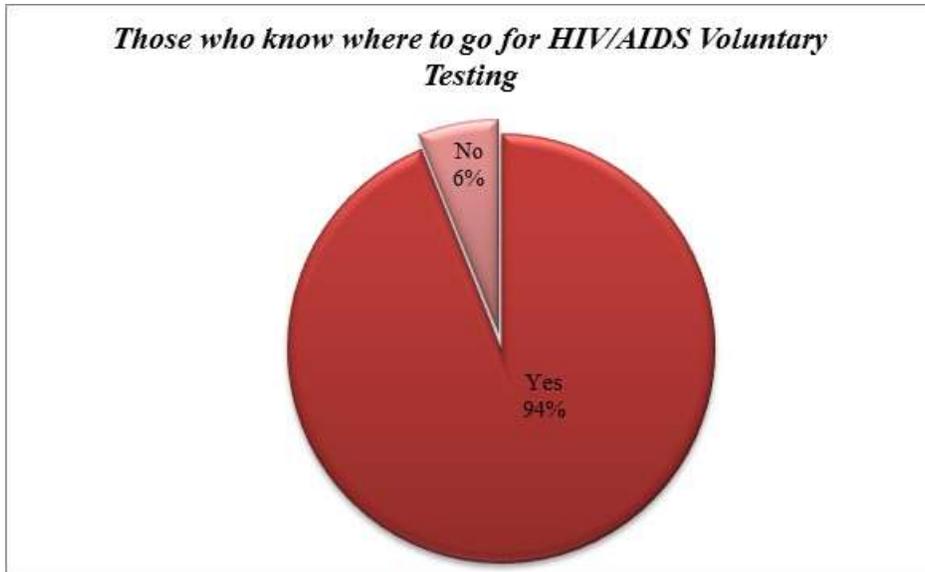


Figure 3-30: Respondents who know where to go for Voluntary HIV/AIDS Testing

Source: Survey data.

3.1.5 Waste Management

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



Figure 3-31: Common Waste Disposal Methods

Source: Survey data.

Only 33% of the households in the project area are have toilets.

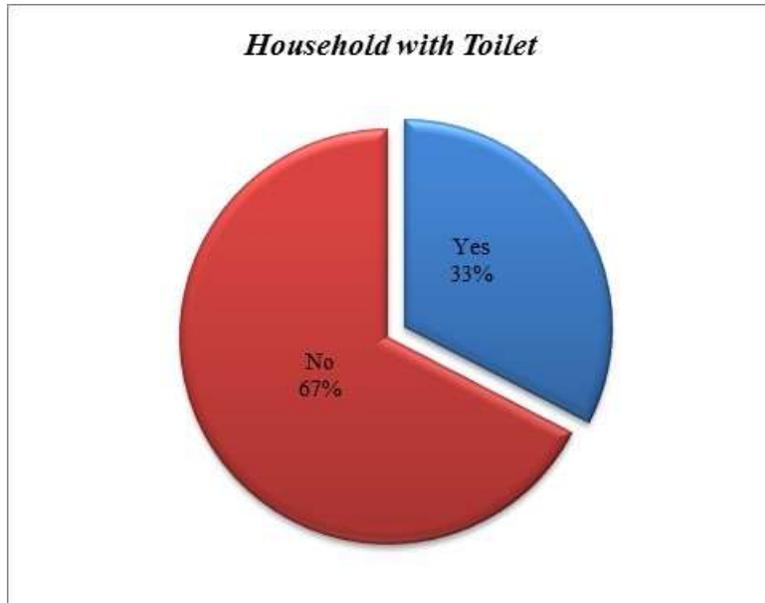


Figure 3-32: Respondents Who Have Toilets in Their Compound

Source: Survey data.

Of these households, the type of toilet is the pit latrine.

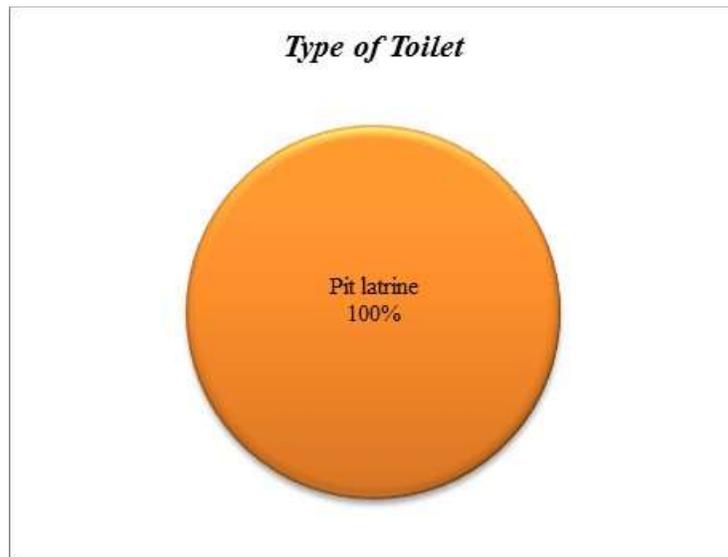


Figure 3-33: Types of Toilets Respondents Have in Their Compound

Source: Survey data.

3.1.6 The Project

Most of the residents are aware of the intended construction of the pipeline and treatment works

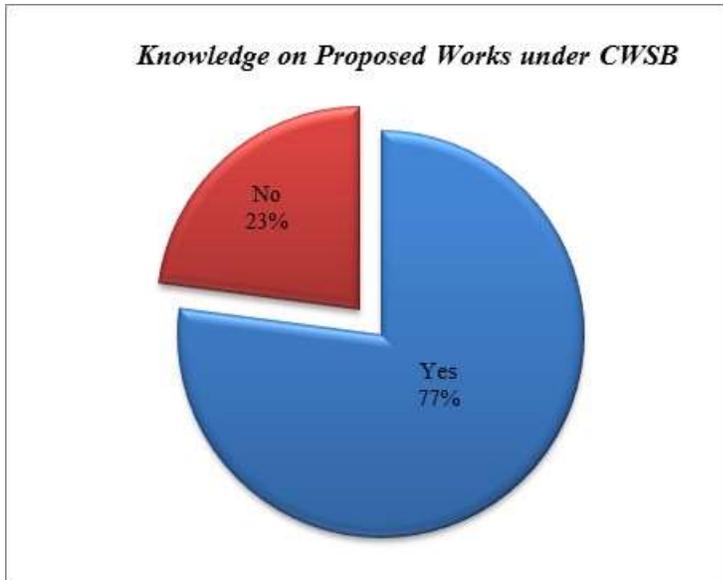


Figure 3-34: Public Awareness of the Intended Construction of the Pipeline

Source: Survey data.

82% of the respondents perceived that the construction of the pipeline will bring positive impacts while 18% percent perceived that it will bring about adverse impacts.

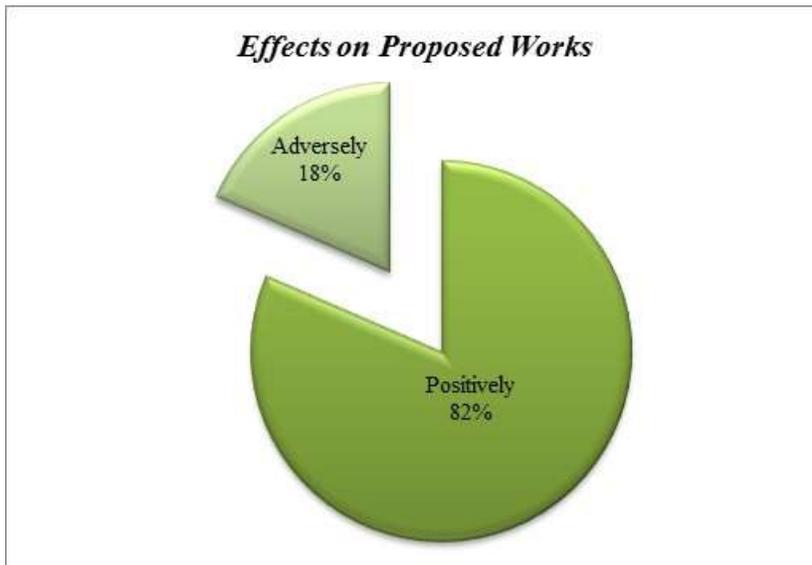


Figure 3-35: Perceived Impact of the Water Supply Project

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.

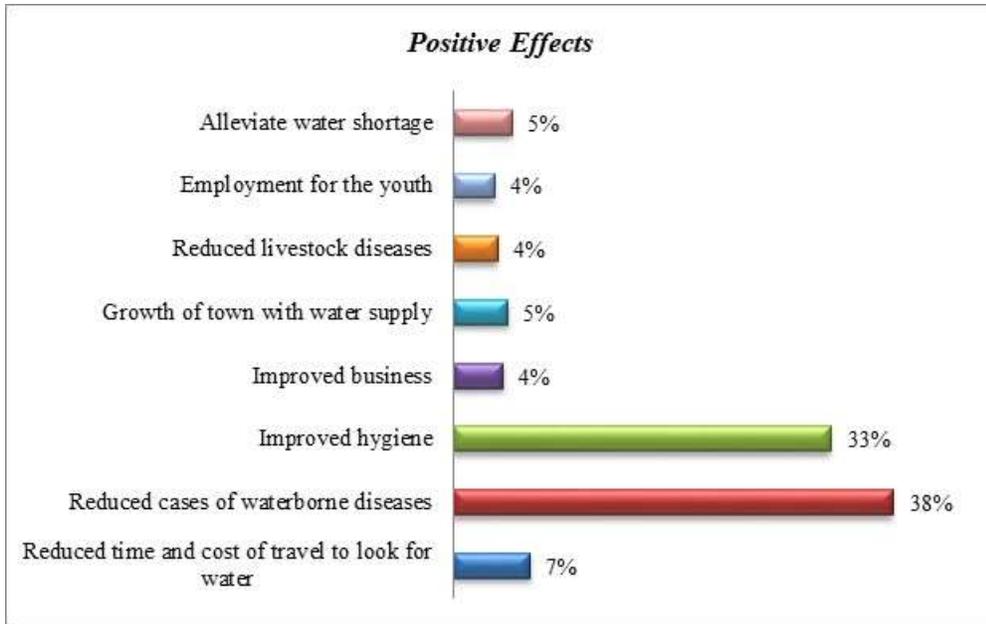


Figure 3-36: Positive Impact of the Proposed Project

Source: Survey data.

The negative impacts expected include loss of land/trees/crops, as well as demolition of structures.

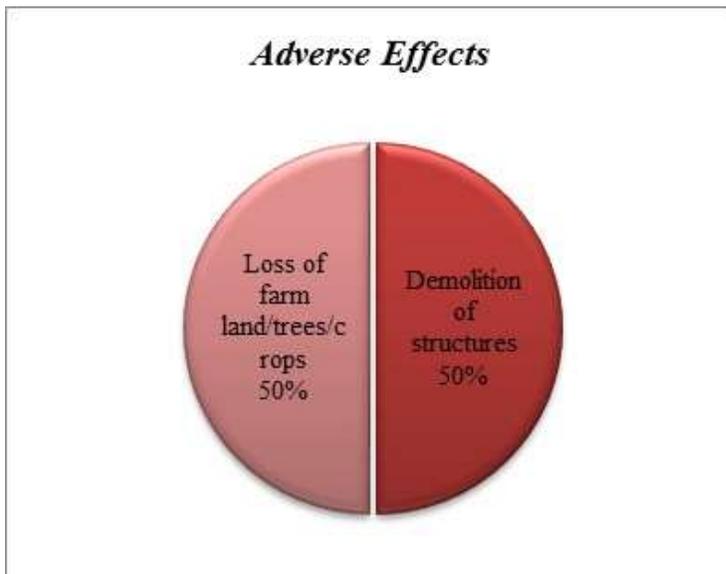


Figure 3-37: Negative Impact of the Proposed Project

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.

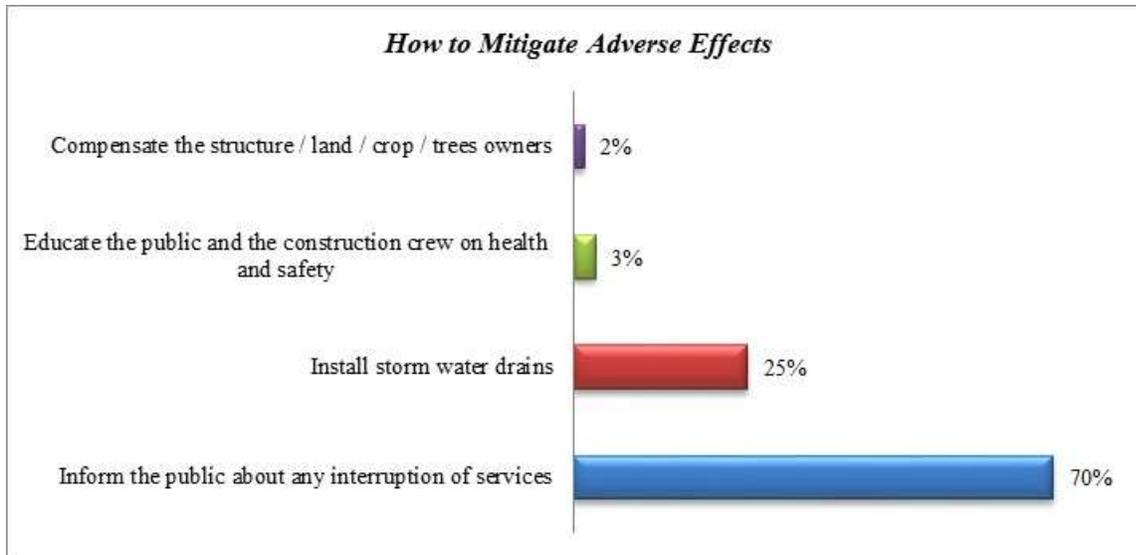


Figure 3-38: How to Mitigate Adverse Impact of the Project

Source: Survey data.

3.2 PHYSIOGRAPHIC AND ENVIRONMENTAL CONDITIONS

3.2.1 Location

Kwale County is located in South Coast of Kenya. It borders the Republic of Tanzania to the South West and the following Counties; Taita Taveta to the West, Kilifi to the North, Mombasa to the North East and the Indian Ocean to the East. It is approximately bounded by longitudes 39°22'E and 39°36'E and latitudes 4°9'S and 4°30'S.

Kwale County covers a total surface area of 8,270.2 square kilometres and accounts for 1.42 per cent of Kenya's total surface area. The project region is defined as Mafundani Shopping Centre to Nyalani Centre to Kasageni Primary School.

Close to the Indian Ocean the area is underlain by coral limestones of Pleistocene age (Caswell, 1953). Further inland are the Magarini sands and Mazeras sandstones of the Tertiary and Triassic ages respectively. Study sites were selected to be within the dominant lithologies of coral limestone and sandstone. The Diani, Ukunda, Tiwi, Waa and Msambweni areas are densely populated, while Shimba Hills is less densely populated.

3.2.2 Topography

Kwale County has four major topographical features namely the coastal plain, the foot plateau, the coastal uplands and the Nyika plateau. The altitude ranges from 0 masl in most of the region bordering the Indian Ocean, to above 480 masl in the hinterland.

3.2.3 Climate

Kwale County has a monsoon type of climate; it's hot and dry from January to April while June to August is the coolest period of the year. Rainfall comes in two seasons i.e. short rains are experienced from October to December while the long rains run from March- June/July. The

average temperature of the county is 24.2oC and rainfall amounts range between 400mm and 1,680 mm per annum.

3.2.4 Drainage

Seasonal Rivers and the Ramisi River form the drainage pattern in the County. The main rivers and streams are Marere, Mwaluganje and river Ramisi. Rivers Marere and Mwaluganje have been harnessed to provide piped water.

3.2.5 Geology

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

3.3 SOCIO ECONOMIC INFRASTRUCTURE

3.3.1 Administration

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

- Vigurungani
- Ndavaya

3.3.2 Health Facilities

There are medical facilities under the management of the government, religious organizations and private owners well distributed in Lango Baya. Extreme health cases are referred to the Kinango Sub-County hospital.

3.3.3 Transport and Communication

Being a Coastal region, the project area is generally flat with occasional changes in the topography. The County's infrastructure consists of telecommunication and road networks with increased investments in the latter to improve the status of the roads. Additionally, there are two airstrips; Diani and Lungalunga, with proximity to the Mombasa harbor and Mombasa's Moi International Airport. Small watercrafts can also use Shimoni, Vanga and Gazi seafronts as ports of entry and exit and mostly facilitate trade in fish products, spices and other consumables between Kenya and Tanzania. Furthermore, Shimoni provides an ideal site for investment in port development and high end holiday retreats like a marina.

The mobile network coverage is limited in the project area.

3.3.4 Commerce and Industry

The county has rich titanium deposits with extraction activities already on going. The Monsoon type of climate in the region that is characterized by hot and dry weather between January and April and cool weather between June and August is favourable for livestock rearing which is a main activity in certain parts of the county. The livestock reared in the county includes camels,

beef and dairy cattle, poultry, goats, sheep as well as bees. The project area is semi-arid. Agriculture is new in the project area as a result of Nyalani dam as shown in the diagram below:



Figure 3-39: Agriculture being practiced in the project area

Being crisscrossed by rivers and streams some of which are seasonal, the county has water resources giving the county huge agricultural potential. Potential to be a key destination for eco-tourism (rainforests and national parks). Kwale is the largest producer of Mangoes in the country with the county contributing 54% of the total mango production in the country. However, due to the lack or poor industrialisation in the county, around thirty per cent of this is either consumed locally, or is left to rot. Other crops grown in the county include coconut, vanilla and Aloe Vera.

With around 250 km of shoreline and 350 nautical miles of EEZ and fisheries, the county also relies on fish as a major economic activity. The inshore fisheries potential includes lobster, crabs, octopus, and pelagic fishery.

Accessible via Moi International Airport, Mombasa Harbour, Shimoni and Vanga ports and airstrips at Diani and Lungalunga, the County is a favorite destination for international tourists who patronize scenic sites and experiences such as Shimba Hills game reserve and the Mwaluganje Elephant Sanctuary; historic sites of Shimoni, Fahamuni and Funzi amongst others; Kisite/Mpunguti game park and Marine reserve; the cultural shrines popularly known as ‘kayas’; Marere cold water springs; ‘Maji moto’ hot water springs and the friendly coastal culture.

3.3.5 Local Communities

The project area is home to the Digo and Duruma people. These people belong to the Mijikenda ethnic group of the former Coast Province of Kenya. Other tribes found in the county include the Kambas, Arabs and Indians though to a very small proportion compared to the Digos and Durumas.

4 RELEVANT LEGISLATIVE/ REGULATORY FRAMEWORK

There are many laws and regulations governing issues of environmental concern in Kenya. The principal National legislation is the Environmental Management & Coordination Act of 1999 typically referred to as EMCA. EMCA empowers stakeholders to participate in sustainable management of the natural resources. It calls for Environmental and Social Impact assessment (ESIA) (under Section 58) to guide the implementation of environmentally sound decisions. 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 is being undertaken.

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

4.1 THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT (EMCA)

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

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

The Act consists of Sectoral Plans for the medium and long term intended to lead to sustainable development in the country. EMCA puts special emphasis on environmental management, pollutions and nuisances, and the necessity to safeguard the well-being of the populations.

The second schedule of EMCA stipulates that an EIA is required for:

- Water transport, presumably water distribution systems,
- Drilling for the purposes of using groundwater for water supplies,
- Use of water for agricultural purposes for irrigation,
- Sewerage disposal works.

It should therefore be clear that the granting of a license by the Water Resources Management Authority for exploitation of a water resource for certain categories of projects should be predicated on the execution of an EIA as contained in this schedule of the Act.

4.2 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). 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:

1) 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

2) 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.

4.2.1 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.

4.2.2 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.

4.2.3 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”.

4.2.4 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).

4.2.5 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.

4.2.6 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).

4.3 WATER ACT 2002

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. Section 75 allows a licensee for water supply to construct and maintain drains, sewers and other works for intercepting, treating or disposing of any foul water arising or flowing upon land for preventing water from being polluted. Section 76 prohibits discharge of trade effluent into sewers without consent, and section 77 indicates some payment for such discharge.

This Act, apart from its introductory part 1 on interpretations contains key issues on ownership and control of water in Kenya and water resources management through the creation, under powers vested in the Minister of Water. 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), eight of which have been established countrywide. These Boards are required to contract out water delivery services to Water Services Providers (WSPs), which may be public, private entities or community managed entities dedicated to water services provision.

Coast Water Services Board (under whose jurisdiction this project falls) is one of the eight (8) state corporations created under the Ministry of Water and Irrigation pursuant to the Water Act 2002. The Water Boards were products of Water Reforms that were initiated by the Government of Kenya culminating in the enactment of the Water Act, 2002. The purpose of these reforms was to improve the management of water resources; improve access to water and sanitation services; enhance accountability for water resource management through decentralized provision of service and improve utilization of water resources, for both domestic and irrigation purposes

The Water Sector reforms aimed at achieving an efficient and effective way of managing water resources. In order to enhance this efficiency and effectiveness, the Ministry of Water and Irrigation (MWI) continues to vigorously implement the reforms to improve service delivery of water and sewerage service to customers.

The reforms took cognizance of government policy papers such as:

- ❖ The Economic Recovery Strategy for Wealth and Employment Creation (2003 - 2007),
- ❖ The Poverty Reduction Strategy Paper (2002) which outlines the priority measures that are necessary to achieve the twin objectives of poverty reduction and economic growth, the government's commitment to the achievement of Millennium Development Goals (MDGs) on water and sanitation by the year 2015

- ❖ The Kenya Vision 2030, which is the country's development blueprint
- ❖ The National Water Services Strategy (2007-2015), which aims at the development and monitoring of water and sewerage services.

Due to the vastness of the CWSB's area of jurisdiction, the Board has representative offices at sub-county level that act as coordination centres between the Board and water service provision companies as well as representing the Board in the sub county's water related issues. The proposed water project is under Malindi Water and Sanitation Company (MAWASCO).

The Act also provides for public consultations where appropriate in the use of the resources notably where such use is likely to impact negatively on the quantity, quality of the water resources in any catchment area.

Section 94 (1) states that No person shall, without authority under this Act -

- ❖ Wilfully obstruct, interfere with, divert or obstruct water from any watercourse or any water resource, or negligently allow any such obstruction, interference, diversion or abstraction; 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 be likely to cause, pollution of the water resource.

Section 94 (2) states that a person who contravenes section 94 (1) shall be guilty of an offence.

4.4 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.

4.5 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 programmes;
- (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.

4.5.1 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;
 - (i) Compulsory acquisition;
 - (ii) Reversion of leasehold interest to Government after the expiry of a lease; and

(iii) Transfers; or

(iv) 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.

4.5.2 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 way leave, 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 way leave until all prescribed or required information has been submitted to it.

(3) In order to enable a proposed way leave 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 way leave and references to "the applicant" in this Sub-part in relation to an application to create a way leave 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 way leave 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 way leave 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 way leave is to be created; and

(d) Any other interested person.

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

4.5.3 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-

- ❖ 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.

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 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 way leave, 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 way leave 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 way leave shall include any preliminary work undertaken in connection with surveying or determining the route of that way leave, and whether the trees, crops or buildings so damaged were included in the route of the way leave as delineated in the order of the Cabinet Secretary.

(4) The duty to pay compensation payable under this section shall lie with the State Department, county government, public authority or corporate body that applied for the public right of way and that duty shall be complied with promptly.

(5) If the person entitled to compensation under this section and the body under a duty to pay that compensation are unable to agree on the amount or method of payment of that compensation or if

the person entitled to compensation is dissatisfied with the time taken to pay compensation, to make, negotiate or process an offer of compensation, that person may apply to the Court to determine the amount and method of payment of compensation and the Court in making any award may, make any additional costs and inconvenience incurred by the person entitled to compensation

(5) The Commission shall make Regulations prescribing the criteria to be applied in the payment of compensation under this section and to give effect to this section.

4.6 THE CONSTITUTION OF KENYA 2010

4.6.1 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, utilisation, 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) Utilise 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 recognised 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.

4.6.2 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 unalienated 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.

4.7 LEGAL FRAMEWORK OF THE GOK IN REGARD TO LAND OWNERSHIP AND TRANSACTIONS

4.7.1 Land Ownership in Kenya

Kenyan law recognises three categories of land in Kenya subsequent to which, basic or radical title vests either in the Government for Government land, registered owners in the case of titles granted by the Government; and in the County councils for both Trust land and registered titles derived from Trust land.

1) Government Owned Land

Land that previously vested in the Regions was relocated to the Government of Kenya in 1964 and this situation continues to this date. Government land includes all un-alienated government land held and occupied by government agencies, territorial sea and sea bed, all public roads whether gazetted or not and land that remained un-adjudicated under the Land Titles Act (Cap.282).

2) Trust Lands

The Kenya Independence Order Council in 1963 provided that all land that was vested in Her Majesty or in the Governor shall be deemed to have vested in the Regions or the Government of Kenya on 12th December 1963. All trust lands are vested in County councils, to hold such land for the benefit of the persons ordinarily resident on that land. Under section 117 of the Constitution, an Act of Parliament may empower a County Council to set apart an area of trust land vested in it for public use and occupation. Thus Local Government Act (Cap. 265) provides for the establishment of local authorities and defines their functions. Local Authorities exist for the purposes of planning for and providing basic social amenities and services including education, health care, roads, sanitation, housing, markets, open spaces, parks etc. The local Authorities as such are vested with authority over trust land for the benefit of their residents. Such land can thus be allocated for occupation as follows:

- ❖ For the purposes of prospecting for or the extraction of minerals or mineral oils; or
- ❖ By any person or persons who in the opinion of the County council will benefit area residents.

This latter clause is important because it provides for access to land by schemes meant to benefit the public. Transfer of such land either to individuals, institutions or other group is through letters of allotment which must cite the minutes of a full Council meeting which approved the transaction.

3) Private land

Private land is all land with registered title in accordance with any registration statute. Under the National Constitution, all land is vested with the Government and occupants of private land only enjoy usage rights either under lease or freehold arrangements. Section 70 of the Constitution of Kenya recognizes and protects the right to private property including land.

4.7.2 Legal Provision Governing Voluntary Land Transactions in Kenya

Towards safeguarding this unalienable constitutional right, legal provisions on land registration and ownership have been put in place as follows:

1) State-owned land

State owned land is governed by diverse laws depending on the purpose for reservation.

2) The Government Lands Act (Cap.280)

The Act governs the allocation and administration of all Government land both urban and agricultural. State owned land may be allocated free or sold on a commercial basis to individuals or communities by the Minister responsible for land administration. For cases where the state-owned land is being used by the public (for instance as settlements, for farming, for grazing or any other productive activity) the individual or the community would be expected to pay compensation.

3) Forests Act 2005

All state forests in Kenya were gazetted under Cap 383 but are now protected under the Forest Act 2005. The Forest Act allows for several avenues towards accessing and use of forestland:

- ❖ Under the Forest Act, a piece of forest land can be de-gazetted and converted to other uses. Forest Act however requires all de-Gazettement of forest land to be discussed and approved by Parliament. All de-gazetted land then reverts to the Commissioner of Lands who then proceeds to allocate in line with the Land Control Act.
- ❖ Under the Forest Act 2005, forestland can also be leased for use for other purposes provided that such use does not contradict the purpose for land reservation.
- ❖ The same Act also allows for Participatory Management of Forests and thus guarantees communities (under auspices of Community Forest Associations) rights to access and utilize certain forest goods and services including siting of water supply intake works in forest areas. These intake works require that small infrastructure be placed in water courses to allow for abstraction.

4) Wildlife Act Cap 376:

Nature Reserves and National Parks are controlled by the Kenya Wildlife Service under the Wildlife Management and Co-ordination Act of 1976. The common feature with all land reserved for use by wildlife is that its conversion to any other form must be approved by parliament.

5) Museums and National Monuments:

Quite often, sites of historical and cultural importance are gazetted and reserved under the Museums and National Monuments Act. Such land is never available for alternative uses.

6) Riparian Reserves and Water Courses:

All riparian reserves in Kenya governed by the Water Act of 2002 which empowers the Water Resources Management Authority (WRMA) to define, conserve and regulate activity in riparian areas.

7) Road reserves

All road reserves are public land reserved under the Physical Planning Act Cap 286. Road Reserves are unique as public utility lands where all infrastructure lines such as for water supply, power and telecommunication will be found.

8) Trust Lands

Trust land is defined as land held in trust in Part IX of the Constitution and the Trust Land Act (Cap.288). The Trust Lands Act (Cap.285) governs the administration of land as described in section 114 of the Constitution.

9) Private Land:

Transactions in private land in Kenya is regulated under diverse laws namely:

1. Registration of Titles Act (R.T.A):
2. The Land Titles Act (L.T.A): Private land is all land with registered title in accordance with the Land Titles Act (Cap.282).
3. The Registered Land Act (R.L.A) governs registration of title to land, and for regulation of dealings in such land. It provides for private ownership of land by individuals. It should be noted that both individual and corporate persons can hold title under the RLA.
4. The Land Control Act Cap 406: This statute allows for all private land to be adjudicated and registered following which, a title deed is issued to the registered owner. Acquisition of private land is through transfer of the Title Deed either on account of inheritance, purchase or free gift but in all cases, transfers must be registered with the Sub-County Land Registrars following approval by the Land Control Boards

4.7.3 Legal Provision for Involuntary Land Acquisition in Kenya

The Kenyan law has an explicit provision for expropriation of land under any of three categories.

In Kenya, expropriation is provided for in the Constitution under section 75 for private land and sections 117 and 118 for unregistered Trust Land. Section 75(1) provides that the Government can take possession of private land if this is necessary in the interest of town planning among other public interests, or if the development and utilization of the said land is to promote public benefit:

- a) The development and utilization of the property will promote public benefit among other things.
- b) The necessity for expropriation is great enough to justify any hardship caused to any persons
- c) Law for prompt payment of full compensation makes the provision

4.8 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;

(c) Promote utmost safety and universal precautions in practices and procedures that carry the risk of HIV transmission; and

(d) 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 center 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 counseling" 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 counseling" 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 center" means a testing center 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.

4.9 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

MTPs handbook has gender outcome indicators

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

4.9.1 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 utilisation to ensure empowerment of women.

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

The overall objective of the Gender and Development Policy is to facilitate the mainstreaming of the needs and concerns of men and women in all areas in the development process in the country.

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 Mobilisation- 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.

4.9.2 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 marginalised 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);

(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 citizen ship 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).

4.9.3 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.

4.10 THE OCCUPATIONAL HEALTH AND SAFETY ACT, 2007

This is an Act of Parliament to provide for the safety, health and welfare of 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. The Act has the following functions among others:

Secures safety and health for people legally in all workplaces by minimization of exposure of workers to hazards (gases, fumes & vapours, energies, dangerous machinery/equipment, temperatures, and biological agents) at their workplaces.

Prevents employment of children in workplaces where their safety and health is at risk.

Encourages entrepreneurs to set achievable safety targets for their enterprises.

Promotes reporting of work-place accidents, dangerous occurrences and ill health with a view to finding out their causes and preventing of similar occurrences in future.

Promotes creation of a safety culture at workplaces through education and training in occupational safety and health.

Failure to comply with the OSHA, 2007 attracts penalties of up to KES 300,000 or 3 months jail term or both or penalties of KES 1,000,000 or 12 months jail term or both for cases where death occurs and is in consequence of the employer

4.11 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;

- (g) Protect the historical and cultural heritage, artefacts and sites within the county; and
- (h) Make reservations for public security and other critical national infrastructure and other utilities and services;
- (i) 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
- (j) 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.

4.11.1 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 latter 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.

4.11.2 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.

4.12 NATIONAL POLICY WITH DISTRICT DEVELOPMENT LINKAGES

The consultant takes full cognisance of the various policy papers that have relevance to development in the national space and give them relevance to this particular water infrastructure development activity. Examples of such policy derivations are:

- i) National Poverty Eradication Plan 1999-2015
- ii) Vision 2030
- iii) Private sector development strategy 2006-2010:

4.12.1 National Poverty Eradication Plan (NPEP) 1999-2015

The NPEP has the objective of reducing the incidence of poverty in both rural and urban areas by 50% by the year 2015, as well as strengthening the capabilities of the poor and vulnerable groups to earn income. It also aims to narrow gender and geographical disparities and create a healthy, better-educated and more productive population. This plan has been prepared in line with the goals and commitments of the World Summit for the Social Development (WSSD) of 1995. The plan focuses on the four WSSD themes of the poverty eradication; reduction of unemployment; social integration of the disadvantaged people and the creation of an enabling economic, political, and cultural environment. This plan is to be implemented by the Poverty Eradication Commission (PEC) formed in collaboration with Government Ministries, community based organizations and private sector.

4.12.2 Vision 2030

Vision 2030 is a Government development strategy that is aimed at steering Kenya to a middle income country by the year 2030. It is based on the 3 pillars of political, social and economic advancement and it aims to transform the economy to newly industrialized status by 2030 and achieve sustainable growth. Environmental considerations of development are contained within the social and economic pillar. On poverty reduction, the vision aims at creating opportunities for the poor by making institutions stronger.

4.12.3 Private sector development strategy 2006-2010

The strategy focuses on improving Kenya's business environment, institutional transformation, trade expansion, improved productivity and support to entrepreneurship and indigenous enterprise development. One of the key factors for the improvement of productivity is the adoption of modern, appropriate technologies.

4.12.4 Kenya National HIV/AIDS Strategic Plan, KNASP 2005/06-2009/10

The plan is linked with the National Development Plan and the National Poverty Eradication Plan 1999 – 2015. The overarching theme is Social Change to reduce HIV/AIDS and Poverty. The goal of the KNASP 2005/06-2009/10 is to reduce the spread of HIV, improve the quality of life of those infected and affected and mitigate the socio-economic impact of the epidemic at individual, community, sector and national levels. The priority areas for KNASP 2005/06-2009/10 are three-fold:

Priority Area 1: Prevention of new infections

The objective of this priority area is to reduce the number of new HIV infections among both vulnerable groups and the general population

Priority Area 2: Improve the quality of life of people infected and affected by HIV/AIDS

The objective of this priority area is to improve the treatment and care, protection of rights and access to effective services for infected and affected people by HIV/AIDS in Kenya.

Priority Area 3: Mitigation of socio-economic impact

The objective of this priority area is to adapt existing programs and develop innovative responses to reduce the impact of the epidemic on communities, social services and economic productivity.

4.13 WORLD BANK SAFEGUARD POLICIES

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

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

4.13.2 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 strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present). One of the native plant species available within the project region is the *Mnondo* tree species. In addition, the project area being generally hot and dry, there are several snake species that have existed for a long time hence the project may disturb them from their natural environment.

4.13.3 The Bank's Operational Policy 4.12: Involuntary Resettlement

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

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

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects. The project being implemented in the community land, no much resettlement is anticipated. However, in the region between the treatment works and the road, there shall be

temporary resettlement of a few PAPs but once the pipeline accesses the road, they may reestablish their farming activities.

4.13.4 Operational Policy (OP) 4.10 - Indigenous Peoples

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 inter-generationally inclusive. The project being a food security project is prone to benefit the residents as they will access water for irrigation around the dam area in addition to accessing piped water within the distribution network.

4.13.5 Operational Policy (OP/BP) 4.11: Physical Cultural Resources

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. For projects involving substantial civil works a set of "chance find" procedures is to be developed and included into the contracts to be used in case of accidental discovery of cultural objects during construction. There were no outright cultural resources identified within the scope of the project. However, the county as a whole had a significant number of cultural heritage resources hence the resources may not be affected by the project.

4.13.6 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 the client: ESIA/ESMPs, RAPs, Vulnerable and Marginalized Group Plans the Bank takes the approach that the Client provides such documents to the Bank with the understanding that the Bank will make them available to the public in addition to local disclosure in-country. The involvement of the public through public consultation meetings as well as key informant interviews adequately caters for the public access to information.

5 PUBLIC CONSULTATIONS

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 the establishment of a treatment works, pump houses, water tanks and placement of pipelines will often relate to land-take, biodiversity, 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 and Kwale Counties as indicated by the following consultation registers in tables 5-1.

Table 5-1: Persons met during the ESIA study in planning the Proposed Water Supply Project

No.	Name	Office	Designation	Contacts
1	Mr. Mwarimo Salim	Vigurungani location Public Health Office.	Public Health Office	+254721282863
2	Clement Mukulia	Coast Water Services Board Kinango.	Sub County Coordinator CWSB.	+254726979571
3	Mr Michael Kilonzo	Nyalani Sub-County Hospital.	Hospital Administrator.	+254715504321

5.2.1 Overview from the Public Health Officer.

The Public Health Officer welcomed the Consultants to their County offices and was pleased about the project. The Consultants proceeded to ask health based questions about the project area.

The public health officer stated that there were isolated cases of diarrhea diseases but in very few occurrences. He also pointed out that the water obtained from water pans by the residents was untreated but most people had to treat or boil it before use.

Despite the poor sanitation in the area, there was a low prevalence of water borne diseases in the project area.

5.2.2 Overview from the Coast Water Services Board Coordinator of Kinango Sub-County.

The CWSB coordinator at Kinango Sub-County stated that the project area would greatly benefit from the project.

He proceeded to explain to the consultants the exact location of the proposed project since the area did not have any existing pipelines save for an old tank that had been vandalized that had been used in the past to supply residents with clean water.

He pointed out that the main beneficiaries of the project would be the local schools that have been greatly affected by the lack of water as some students had to miss school while traveling long distances in search for water.

5.2.3 Overview from the Sub-County Hospital Administrator.

The sub-county hospital administrator welcomed the consultants and proceeded to give them the information they were seeking. He went ahead to state that waterborne diseases in the area were rare. He said that the main cases prevalent in the hospital were malaria, anaemia and respiratory diseases.

He stated that the hospital received piped water from Marere. In instances where this water was not adequate, the alternative source of water would be from boozers provided by the county. Present in the hospital was a reservoir tank and plastic tanks to harvest rain water. There was also an uncompleted borehole whose water was too salty and could only be used for cleaning purposes.

The hospital administrator pinpointed that the main problem with the Marere pipeline supply was leaks that occurred along the pipeline hence cutting off water supply for even a week. On top of that, the Marere supply was inadequate in itself as sometimes the hospital could go for even a full month without water.

Some of the recommendations that he gave was the construction of a tank at Baraza Park to prevent the problem of pipe leaks and low pressure due to people tapping water along the Marere pipeline, some of them being illegal.

5.3 PUBLIC CONSULTATION

The Consultant carried out public consultation in the form of a consultative meeting where, the Consultant presented the project to the local community, comprised of stakeholders. The Consultant held a meeting on 9th June 2016 at the chief's office in Mwakijembe, minutes, photos and an attendance sheet of the meeting are presented in appendix 12.2.

5.3.1 Findings of the meetings

The meetings included a presentation by the Consultant on the proposed works, the various environmental and social impacts that may arise from the project including temporary resettlement along the connection from the treatment plant and the road where the distribution lines will remain within the provided 9m road reserve as provided in the design report. The consultant however pointed out that the Designers had tried their very best to minimize resettlement and that the proposed distribution lines would not permanently displace any persons. She highlighted the mitigation measures for all the impacts in accordance to the RAP. She also disclosed the features of the RAP including cut off dates.

Being a public consultation meeting, feedback from the stakeholders was obtained with majority of the stakeholders approving of the project however requesting that their preference to seek local labor and local materials be met before the implementation of the project. The meeting was successful, with the public accepting the project.

6 ENVIRONMENTAL AND SOCIAL EFFECTS OF THE PROPOSED PROJECT

This chapter presents the general environmental and social impacts which may result from the proposed project. The emphasis will be initially on the specific impacts that are likely to result from the nature of works (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 Nyalani locality 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 ₄ and CO ₂		X	X		X			X	
	Increased levels of dust and particle emissions from construction vehicles and equipment		X	X			X		X	
soil/water pollution	Contamination of 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		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
	construction activities and traffic									
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

Aspect	Predicted Impact	Characterization of Impacts								
		Nature		Effect		Time Range			Reversibility	
		Positive	Negative	Direct	Indirect	Short Term	Medium Term	Long Term	Reversible	Irreversible
Health and safety	Improvement in public health and sanitation through improved potable water supply & reduction in sewer blockages.	X		X		X	X	X		
Water	Increased clean water supply to the target WSP areas by KWAWASCO which could further 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 for the various aspects of the project.

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:

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

Several displacement of businesses and structures will occur at the off-take at Nyalani Dam, the treatment works as well as along the 1.7Km pipeline.

Mitigation measures
<ul style="list-style-type: none"> <input type="checkbox"/> The pipeline runs within community land and along the road. In order to minimize land acquisition, the path the pipeline will take will be within the designated road reserve. However for the treatment works and the pipe intake where land acquisition is inevitable, the land in question shall be acquired in accordance with the applicable law. <input type="checkbox"/> Project affected persons to be identified by type of loss through a detailed resettlement action plan. <input type="checkbox"/> The affected persons to be compensated for loss of houses and ancillary buildings, land, trees, livelihood productivity, and land improvements <input type="checkbox"/> KWAWASCO and CWSB 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 <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. <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.

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:

1) 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.

Mitigation measures
<ul style="list-style-type: none"> <input type="checkbox"/> The Contractor should provide temporary road signs or notices to indicate ongoing works; <input type="checkbox"/> The Contractor should effect traffic controls and cleanliness to avoid congestion and truck accidents on roads; <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; <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; <input type="checkbox"/> For the site traffic the Contractor has to ensure that they <ul style="list-style-type: none"> • Only park in designated parking areas; • Don't block pedestrian routes; • Don't block traffic routes; • Obey the speed limit • The resident Engineer has to ensure that the Contractor: <ol style="list-style-type: none"> i) Introduces segregated pedestrian walkways; ii) Introduces speed limits; iii) Reduces the need for reversing vehicles, by introducing a one way system; iv) Uses a qualified BANKSMAN to control deliveries and reversing vehicles; v) Designates loading/unloading areas.

2) Site Related Oil Spills

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

Mitigation Measures
<ul style="list-style-type: none"> <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; <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;

- 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;
- All vehicles and equipment should be kept in good working order, serviced regularly and stored in an area approved by the Resident Engineer;
- The Contractor should assemble and clearly list the relevant emergency telephone contact numbers for staff, and brief staff on the required procedures.
- All vehicle works should be done in one place to avoid chances of spillage in different parts of the camp

3) 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

- 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.
- 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
- 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.
- Plan emergency response measures in case of accidental oil spills.

4) Socio - Economic Impacts

During construction the project will have clear benefits with regard to local employment opportunities. The project will additionally require various skills and services which may not be available on the local level but certainly on the regional level, e.g. 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

Mitigation
<ul style="list-style-type: none"> <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. <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. <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.

5) Air Quality

Construction activities of bush clearing, materials delivery, treatment site clearance, 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.

Mitigation:
<ul style="list-style-type: none"> <input type="checkbox"/> Use protective clothing like helmets and dust masks on construction crew. <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 (schools, hospitals, etc.). <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. <input type="checkbox"/> Digging of trenches should be done manually (if possible) so as to avoid too many trucks and machines in the area. The use of manual labor will also benefit the community socio-economically. <input type="checkbox"/> Use of other dust palliative measures to reduce dust emissions

6) 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.

7) Biodiversity and Conservation Impacts

Removal of vegetation as well as trees will lead to loss of plants and animal habitat. The biodiversity 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 possible 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.

8) 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 the E941 road, which will increase the risk to the users of the road.

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.

Immigration 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.

Mitigation:

- Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards.
- Establish a Health and Safety Plan (HASP) for both civil and electromechanical work.
- Appoint a trained health and safety team for the duration of the construction work.
- Use of dust masks while working in dusty environment to avoid respiratory related sicknesses.
- Provide workers with appropriate personal protective equipment (PPE).
- Provide workers with adequate drinking water and breaks.
- Provide workers training on safety procedures and emergency response such as fire, oil and chemical spills, pipe bursts and other serious water loss risks.
- Roads passing through population centers will be water sprayed to reduce dust.
- 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.

- Work to minimize or altogether eliminate mosquito breeding sites.
- Provide appropriate human and solid waste disposal facilities
- Provide crossing points along the trenches to allow people to maintain their normal activities, also cautionary signage should be provided along the trenches.
- Provide clean toilets for workers

9) Service Delivery Impacts

The construction activities will cause disruption of services such as water supply and transportation within the project area. Trucks with heavy loads of construction materials may damage murram 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 reservoir.

Mitigation:

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

10) *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.

Mitigation:

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

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.

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

1) *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;
- ❖ 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:

2) 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. Nyalani area and its environs do not have a defined sewerage or sanitation facility hence the majority of stakeholders within the project area use pit latrines.

Water supply will lead to an increase in the generation of solid and liquid waste.

Mitigation measures:
<ul style="list-style-type: none"> <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. <input type="checkbox"/> Put in place adequate and efficient sanitary facilities for handling liquid waste especially waste water to protect the ocean from pollution. <input type="checkbox"/> Come up with regular trash collection system in the site areas so as to avoid accumulation of waste. <input type="checkbox"/> KWAWASCO should heavily invest in a waste water collection and treatment system for the long-term. This will ensure proper handling of waste water for the future generations to come and help in the protection of the local environment from possible contamination with direct sewage.

3) 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:
<ul style="list-style-type: none"> <input type="checkbox"/> 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. <input type="checkbox"/> Leaks and pipe bursts to be promptly repaired to avoid contamination of water resources especially shallow ground water. <input type="checkbox"/> Constant policing of network to check for illegal connections

4) 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.

5) Impact on Water Resources

The generated soil and liquid waste from the local community will eventually make its way into the ground water hence resulting to a negative effect on the ecological system.

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.

6) 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 KWAWASCO approved rates and this impact is not foreseen

7) 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.

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.

7 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 7 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 7-1: Cost Estimates for Environmental Mitigation KShs. 5,590,000.00

8 ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT PLAN (ESMMP)

By design, the potential positive impacts of the project can readily be optimised while the potential 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.

8.1 POSSIBLE ENHANCEMENT MEASURES

Possible enhancement measures of beneficial impacts would include the following:

- ❖ Construction should adhere to recommended best construction practices that make effective and economical use of locally available resources including materials, expertise and labour.
- ❖ Ensure that the poor and other vulnerable in the project area 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 the borehole, its pump and other components to initiate immediate rehabilitation whenever problems are identified to reduce system leakage and losses.

8.2 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 8 1. Also considered in this management and monitoring plan are the persons responsible for implementation.

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

Project Phase	Environmental / Social Impact	Mitigation Action Plan	Responsibility
Pre-construction	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 done according to the prevailing market rates in the area.	CWSB/KWAWAS CO/County government
Pre-construction	Loss of structures	As a first step, the owners, type of structures and businesses are identified. The compensation will be done at replacement cost.	CWSB/KWAWAS CO/County government
Pre-construction	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	CWSB/KWAWAS CO/County government

Project Phase	Environmental / Social Impact	Mitigation Action Plan	Responsibility
Construction	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</p> <p>KFS on appropriate replanting seedlings</p> <p>Sub-County Environmental officer</p>
Construction	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>
Construction	Noise and Dust	<p>Use protective clothing like helmets and dust masks by 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</p>	<p>Contractor</p> <p>Supervising Engineer</p>

Project Phase	Environmental / Social Impact	Mitigation Action Plan	Responsibility
		are near sensitive receptors, such as residential areas or institutions.	
Construction	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 KWAWASCO
	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
Construction	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</p>	Contractor Supervising Engineer KWAWASCO

Project Phase	Environmental / Social Impact	Mitigation Action Plan	Responsibility
		<p>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>	
	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>	KWAWASCO beneficiaries
Construction	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

Project Phase	Environmental / Social Impact	Mitigation Action Plan	Responsibility
Construction	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>	<p>The contractor</p> <p>The Supervising Engineer</p>
Construction	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. Timely consultations with the service providers to ensure smooth relocation/restoration of services.</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

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 8 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 augmentation 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	Frequency of monitoring	Responsibility	Corrective Action
Contractors campsite	Land take	<ul style="list-style-type: none"> The land acquired for each component Number of structures demolished Number of complaints on compensation. 	<ul style="list-style-type: none"> Number of people compensated for land, structures and livelihood. Resettlement/compensation completion report 	Monthly	CWSB	Implement recommendations of ESIA
	Noise	<ul style="list-style-type: none"> Number of complaints Distance from human settlements Limit of acceptable noise standard issued by NEMA 	<ul style="list-style-type: none"> Liaison with other stakeholders such as the contractor, environmental supervisor and local authorities. Documentation on complaints about noise 	Monthly	Environmental Supervisor Contractor	Implement recommendations of ESIA
	Air pollution	<ul style="list-style-type: none"> Number of complaints on dust nuisance Distance from human settlements 	<ul style="list-style-type: none"> Physical inspection Interview residents including workers Liaison with other stakeholders 	Monthly	Environmental Supervisor	Implement recommendations
	Water pollution	<ul style="list-style-type: none"> Number of complaints on pollution of water by downstream users Obstruction of waterways 	<ul style="list-style-type: none"> Number of complaints Physical inspection 	Monthly	Environmental Supervisor	In case of pollution investigation

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
	Occupational Health and Safety	<ul style="list-style-type: none"> • Healthy and safety awareness among staff • Number of accidents and fatalities • Number of HIV awareness campaign meetings held • Outpatient attendance register • First aid facilities in place • Compliance with Occupational Health and Safety Act (OSHA) 	<ul style="list-style-type: none"> • Documentation of accidents • Interviews with workers and management • Liaison with other stakeholders 	Weekly	Contractor	Investigate compliance Implement corrective measures
	Solid and liquid wastes	<ul style="list-style-type: none"> • Presence or absence of scattered litter. • Flow of wastewater on the ground surface • Level of complaints on hygienic conditions and pollution of water sources. 	<ul style="list-style-type: none"> • Physical inspection of site and sanitation facilities • Documentation in grievance register 	Monthly	Environmental Supervisor Contractor	Implement corrective measures

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
Construction Camp	Public health and safety	<ul style="list-style-type: none"> • Prevalence rates of common diseases. • Provision of condoms, contraceptives and mosquito nets. • Conduction of campaign meetings on transmission of diseases like HIV/AIDS and other STDs. • Availability of adequate solid waste bins. • System of safe disposal of both solid and liquid waste in place. • Availability of first aid facilities. • Outpatient attendance registers. • Compliance with the Health and Safety Act. 	<ul style="list-style-type: none"> • Physical inspection • Documentation Number of complaints • Interview with residents 	Monthly	Environmental Supervisor	Investigation compliance make recommendation Implement recommendation
	Solid and liquid wastes	<ul style="list-style-type: none"> • Presence of scattered litter. • Signs of obstruction of water courses. 	<ul style="list-style-type: none"> • Physical inspection • Number of complaints. 	Monthly	Environmental Supervisor Contractor	Implement recommendation

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
Project Site	Solid and liquid wastes	<ul style="list-style-type: none"> Scattered litter Signs of obstruction of water ways. Flow of wastewater on the ground surface. Provision of sanitary facilities to the construction crews. 	<ul style="list-style-type: none"> Physical inspection Number of complaints 	Monthly	Environmental Supervisor Contractor	Implement recommended
	Land, Population growth, Migration and settlements	<ul style="list-style-type: none"> Changes in the value of land. Changes in type of housing. Population growth and ethnic composition. New settlements established and migration closer to the pipelines. 	<ul style="list-style-type: none"> Physical inspection Liase with other stakeholders 	Monthly	Environmental supervisor	<ul style="list-style-type: none"> Implement corrective measures
	Noise	<ul style="list-style-type: none"> Level of noise generated. Provision of PPE. Compliance with existing noise standard issued by NEMA. 	<ul style="list-style-type: none"> Liase with other stakeholders. Documentation on complaints about noise 	Monthly	Environmental Supervisor	<ul style="list-style-type: none"> Implement recommendations

Area	Environmental Component	Performance Indicators	Monitoring Requirements	Frequency of monitoring	Responsibility	Corrective Action
	Air pollution	<ul style="list-style-type: none"> • Level of dust generated. • Provision of PPE. 	<ul style="list-style-type: none"> • Physical inspection • Interview residents including workers • Liaise with other stakeholders 	Monthly	Environmental Supervisor	<ul style="list-style-type: none"> • Implement recommendations

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:

- i) There will be an increased supply of clean water to the Nyalani area under phase I and in future Vigurungani and Bang'a. This will in turn lead to an improvement in the public health of the population due to the reduction of water related ailments.
- ii) The water supply to communities through off-takes and pipeline 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 areas.
- iii) 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 will arise from public participation and consultation will be effectively highlighted and incorporated after the said public participation and consultation meetings are 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 areas.

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 which is provided under a separate report.

11 REFERENCES

- Republic of Kenya (2004), State of Environment Report, NEMA, Nairobi
- Republic of Kenya (2004), District Environment Profile, NEMA, Nairobi
- Republic of Kenya, Environmental Management and Coordination Act (EMCA, 1999), Government Printer, Nairobi
- 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 Constitution of Kenya 2010
- The Land Act, No. 6 of 2012

12 APPENDICES

12.1 APPENDIX A SURVEY QUESTIONNAIRE

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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 **Nyalani-Mwakijembe-Vigurungani-Bang'a Water Project Phase I** 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)Sub-County (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) Fishing (6) Others (specify)
- 2.7 If crop farming what type of crops? (1) Maize..... (2) Cashew nuts (3) Cassava.....
- (4) Mangoes (5) Beans..... (6) Coconut..... (7) Others.....
- 2.8 If livestock farming how many?
- (1) Cow..... (2)Sheep (3)Goats..... (4) Donkeys (5) Others

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- 2.10 What is the average combined household income per month? (tick) (1) Less than 15,000.....
 (2) 15,000-30,000..... (3) 30,000-50,000..... (4) Above 50,000
- 2.11 What's the religion of the Household Head? (tick) (1) Christian..... (2) Muslim.....
 (3) Hindu..... (4) Traditionalist (5) Others Specify
- 2.12 Type of fuel mostly used for cooking: (tick)
 (1) Firewood (2) Charcoal (3) Kerosene (4) LPG (Gas)
 (5) Electricity (6) Others (specify)

SECTION 3 WATER AND SANITATION

- 3.1 What is the 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 litre 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)

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- (1)Compost pit/burying (2) Collection by the council (3) Recycling
- (4) Burning (5) Dumping in open areas (6) Others (specify)
- 3.13 Does the household have a toilet?
- (1)Yes (2) No
- 3.14 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)
- 3.15 Are you aware of the proposed Works under Coast Water Services Board?
- (1) YES (2) NO
- 3.16 How will proposed Works under Coast Water Services Board affect the community here? (Tick)
- (1) Positively (2) Adversely (negatively).....
- 3.17 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)
- 3.18 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)
- 3.19 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?

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- (1) Seek medical attention from a health centre..... (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 MINUTES OF THE PUBLIC CONSULTATION MEETING HELD AT CHIEF'S OFFICE-MWAKIJEMBE ON 9TH JUNE 2016 AT 12.30PM

1) Present

- Marion Orina - Zamconsult Consulting Engineers (Consultant)
- Francis Moturi - Zamconsult Consulting Engineers (Consultant)
- Haji Masa – CWSB representative
- Juma Kidzokha – Kinango Water Staff
- Mwadzombo Ngomango – Chief Mwakijembe
- General Public

2) Introductions

The meeting started at 12.30 pm and was chaired by the chief, who introduced the Consultant to the attendees. He then invited the Consultant to give her presentation.

3) Presentation on Project by the Consultant

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

The Consultant explained the various impacts associated with the project, throughout the project duration (planning, construction, operation and decommissioning, including possible resettlement of PAPs. The Consultant explained that a Resettlement Action Plan had been carried out in order to identify the PAPs. Fortunately, the consultant explained, the area was sparsely populated, furthermore the pipeline would be located along the road and there was minimal encroachment within the road reserve, this she explained greatly reduced the number of potential PAPs. She also explained that an ESIA activity had been carried out in the area to sensitize the public about the Nyalani dam and distribution lines project and now the meeting was being conducted so as to disseminate information on the findings of the ESIA. She further explained all the mitigation measures put in place in view of the anticipated disturbances and assured the public that in case the contractor failed to adhere with the regulations put in place, they could address their complaints to the resident engineer in place for relevant action to be taken.

4) Questions, Answers and Feedback

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

Q1. Mlongo Zungumzo from Mabanga village recommended the formation of a committee to represent the interests of the locals for example provision of youth for training for maintenance activities as well as water provision adding that this committee should be involved in water kiosk allocation. Finally, he recommended gender sensitivity during job allocation by the Contractor.

The consultant noted the local's recommendation for the maintenance activities and training of the maintenance committee. In addition, she explained that the local Water Service Boards would cater for the recommendation since CWSB was only responsible for bulk water supply as opposed to distribution.

The CWSB representative urged the ladies to involve themselves in finding out what opportunities were available for them to be considered.

Q2.Mwagudulo Ngambari from Mabanga village also thanked the consultants for the initiative. He then inquired where the people would lodge their complaints in case the contractor would not agree to prioritize labour from the local area.

The CWSB representative explained that the available resident engineer would cater for all the local complaints for forwarding to the contractor or any other relevant authorities, otherwise the chief could be used as a channel to forward any complaints as an alternative to the resident engineer.

Q3.Abdalla Menza from Mwakijembe village wanted to know what the requirements to acquire a water kiosk were. He also wanted to know if it would be possible to use the water for irrigation purposes.

The Consultant responded that Kwale Water Services Company would be in charge of allocating water kiosks, and would provide the criteria to the locals. The consultant further explained that it would be wasteful to use treated water for irrigation purposes and suggested using water directly from the dam for those purposes.

Concerning the use of water for irrigation, the CWSB representative seconded the consultant's response adding that the water would be metered and would have to be paid for, thus if a person was capable of paying he/she could use the water how they wanted.

Q4.John Mbeja from Mwakijembe village inquired if the project was different from the one at Vigurungani where the contractor did not source labour from the locals.

The consultant noted the observation and insisted that the ESIA for this project had recommended for priority be given to the locals when it came to jobs. The CWSB representative added that the available local labour should be from hardworking individuals so as to ensure efficiency in the construction, pointing out that the Contractor was a business man and needed to have an efficient construction period.

Q5.Nyamau Mwatsaka from Mwakijembe village inquired if there would be any compensation for land.

The Consultant reiterated that the project pipeline was located along the road and as such would not encroach on any private, land. She added that the treatment works was within land that was delineated for the dam, the only place that would have acquisition for a way leave was from the treatment works to the main road and that those PAPs would be compensated.

Q6.Tuka Mrinda Muhanji from Mwakijembe village recommended the contractor to involve the locals in the acquisition of materials for the project from within the project area.

The consultant noted the recommendation in order for forwarding to the Client who would forward the sentiment to the Contractor. The local chief added by recommending order during the material acquisition since the locals were prone to have a tussle amongst themselves regarding material acquisition.

5) Conclusion

The Consultant asked if the people were in support of the project. The locals, by a show of hands approved of the project, stating that their recommendations given in the meeting taken into account. The meeting ended at 1.35 pm with a word of prayer.

12.2.1 List of Attendance

PUBLIC CONSULTATION ATTENDANCE LIST						
PROJECT	NYALANI WATER SUPPLY					
VENUE	MWANBIDAU SUB-LOCATION, ASSISTANT CHIEFS OFFICE					
DATE	09/06/2016					
No.	Name	Designation	Village	Location	Phone No.	Signature
1	MWANGULU GUMBARI	VILLAGER	MARHANGA	NDAVAYA	0707486625	[Signature]
2	MBOE CHAKA		MARHANGA	NDAVAYA	0706818488	[Signature]
3	MWAMU MIMIKA	VILLAGER	MWAKIJEMBE	NDAVAYA	0722251006	[Signature]
4	MENZA N. MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0714265582	[Signature]
5	LIGO TSUMA		MWAKIJEMBE	NDAVAYA		[Signature]
6	JOHN BESA KALI	MWAKIACHI	MWAKIJEMBE	NDAVAYA	071452069	[Signature]
7	CHALE NYAMAU	"	MARHANGA	NDAVAYA		[Signature]
8	CHITI KATHANZA	"	MWAKIJEMBE	NDAVAYA	0702793816	[Signature]
9	MWAKIACHI CHAMBA	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0704719639	[Signature]
10	KOMBO MENZA KUMBA	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0718599300	[Signature]
11	MWAKIACHI TSUMA	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0711164975	[Signature]
12	MWAKIACHI CHAMBA	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0717038865	[Signature]
13	MWAKIACHI MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0726509639	[Signature]
14	BENI MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0728599313	[Signature]
15	MENZA MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0729829596	[Signature]
16	MENZA MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	2706342400	[Signature]
17	MENZA MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0721162704	[Signature]
18	KONEI MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0721546023	[Signature]
19	LEWA MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0700591157	[Signature]
20	DYKA MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA		[Signature]
21	Kambi MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	075532570	[Signature]
22	VUYA CHAMBA	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0709601281	[Signature]
23	MIMUNDO MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	0728599313	[Signature]
24	YANI MIMUNDO	MWAKIACHI	MWAKIJEMBE	NDAVAYA	07	[Signature]
25	BESA KALI		MWAKIJEMBE	NDAVAYA		[Signature]

PUBLIC CONSULTATION ATTENDANCE LIST						
PROJECT	NYALANI WATER SUPPLY					
VENUE	MWANDIMU SUB-LOCATION - ASSISTANT CHIEF'S OFFICE					
DATE	9/6/16					
No.	Name	Designation	Village	Location	Phone No.	Signature
1	Mwambi Mwangi	Community member	Mwambi	Mwambi	0712251234	[Signature]
2	MDEGWA NIPARWA		Mwambi	Ndauya	0722007771	[Signature]
3	LIKAZI CHAKA	SA	Mwambi	Ndauya	0725055525	[Signature]
4	MWANGI MURARO		Mwambi	Ndauya		[Signature]
5	MWANGI MURARO		Mwambi	Ndauya		[Signature]
6	SALIM MBAGA	SI	Mwambi	Ndauya	0713154509	[Signature]
7	MWANGI MURARO		Mwambi	Ndauya	0718066088	[Signature]
8	MWANGI MURARO		Mwambi	Ndauya		[Signature]
9	MWANGI MURARO		Mwambi	Ndauya		[Signature]
10	MWANGI MURARO		Mwambi	Ndauya	0717801661	[Signature]
11	MWANGI MURARO		Mwambi	Ndauya		[Signature]
12	MWANGI MURARO		Mwambi	Ndauya		[Signature]
13	MWANGI MURARO		Mwambi	Ndauya	0712327179	[Signature]
14	MWANGI MURARO		Mwambi	Ndauya	0719216090	[Signature]
15	MWANGI MURARO		Mwambi	Ndauya	0711200028	[Signature]
16	MWANGI MURARO		Mwambi	Ndauya	0711111716	[Signature]
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Figure 5-12-1: Public Consultation Meeting List of Attendance

12.2.2 Public Consultation Meeting Photos



Figure 12-2: The consultant's presentation during the meeting



Figure 12-3: CWSB representative addressing Participants



Figure 12-4: Stakeholder Feedback during Meeting



Figure 12-5: Stakeholder Feedback during Meeting



Figure 12-6: Stakeholder Feedback during Meeting



Figure 12-7: Stakeholders showing their support of the Project