



## **TANATHI WATER WORKS DEVELOPMENT AGENCY**

### **CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECT**

CONTRACT NO. TAWWDA/028/2020-2021



## **Environmental Social Impact Assessment (ESIA) Study Report for The Project**

**May 2023**

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## INTERNAL QUALITY CONTROL

Revision	Purpose description	Originated	Checked	Reviewed	Authorized	Date
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Rev 1.1	Incorporation of Stakeholder's comments	SL AKM	MR	MMM DMO	RN	22/05/2023



# **Dam and Water Supply**

## CERTIFICATION

We hereby certify that the content of this Environmental and Social Impact Assessment Report for the Proposed Namanga Dam Water Supply and Sanitation Project (Dam & Water Supply Component) is factual and that the content conforms to the provisions of the Environmental Management and Coordination Act Cap. 387 and the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2003.

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## ABBREVIATIONS

ACC	Assistant County Commissioner
ASAL	Arid and Semi-Arid Lands
CECM	County Executive Committee Member
CBO	Community Based Organization
CSR	Corporate Social Responsibility
CC	County Commissioner
DCC	Deputy County Commissioner
DOSHS	Directorate of Safety and Health Services
DWC	Double Wall Corrugated
EMCA	Environmental Management Coordination Act
EHS	Environmental Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GDP	Gross Domestic Product
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Virus
KFS	Kenya Forest Services
KMD	Kenya Meteorological Department (KMD and
KWS	Kenya Wildlife Services
ICOLD	International Commission on Large Dams
KWS	Kenya Wildlife Services
LPG	Liquefied Petroleum Gas
MCA	Member of County Assembly
MD	Managing Director
MP	Member of Parliament
MoWSI	Ministry of Water, Sanitation & Irrigation
NEMA	National Environment and Management Authority
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organization
O & M	Operation and Maintenance
ODF	Open Defecation Free
OLWASCO	Ol Doinyo Orok Water & Sewerage Company Ltd
OSHA	Occupational Safety and Health Act
OWASCO	Olkejuado Water & Sewerage Company
PAPs	Project Affected Persons



PPE	Personal Protective Equipment
RAP	Resettlement Action Plan
RC	Reinforced Concrete
RCC	Roller Concrete Compacted
SGR	Standard Gauge Railway
SOPs	Standard Operating Procedures
SSHPP	Site Safety Health Procedures
STIs	Sexually Transmitted Diseases
TAHMO	Trans-African Hydro-Meteorological Observatory
TAWWDA	Tana Athi Water Works Development Agency
ToR	Terms of Reference
WASREB	Water Services Regulatory Board
WHO	World Health Organization
WRA	Water Resources Authority
WRUA	Water Resources Users Association
WTP	Water Treatment Plant
WWTP	Waste Water Treatment Plant



## 0 EXECUTIVE SUMMARY

### 0.1 Introduction

This Environmental Social Impact Assessment Report is prepared in line with the revised Terms of Reference (TOR) for the **Consultancy Services for Detailed Design of Namanga Dam Water Supply and Sanitation Project**. It is also prepared as per the Environmental Management Coordination Act CAP 387, for submission to National Environment Management Authority for obtaining an EIA license before construction of the project commences. The key objectives of the assignment are to carry out Detailed Designs and Tender Documentation for Namanga Dam Water Supply and Sanitation Project. The Consultant will also prepare the Resettlement Action Plan and assist in its implementation among the Project Affected Persons. This report focuses on the dam and water supply component of the project. A different report is provided for the sanitation component.

The proposed Namanga Dam and Water supply project will be located in Kajiado County, an area that is predominantly categorized as arid and semi-arid. It is characterized by limited water resources, evidenced by low precipitation, seasonal rivers and low surface water yields. The area also experiences frequent droughts which are exacerbated by the climate change phenomenon. As a result, residents in this area rely on groundwater which is usually salty or they have to walk for long distances in search of fresh water. This creates an economic and social burden on the communities living in these areas. It is against this background that the proponent has proposed to develop a water supply project so as to address the challenge of inadequate water supply in the area. This report presents the Environmental Social Impact Assessment Report and a methodology to be adopted in the preparation of the Resettlement Action Plan.

### 0.2 Project Description

Namanga Dam Water Supply and Sanitation Project is located in Kajiado County. The dam site is located at a distance of approximately 23km from Namanga Town (from Ol Doinyo Orok Water Supply Company). It is about 6km from Mile Tisa centre. The dam axis is at approximately UTM coordinates 255924E, 9729005N (WGS84, zone 37M). The proposed Project area is about 165km South of Nairobi City and is accessed via Road A104 (Nairobi-Namanga-Arusha road). The proposed dam site is accessed from Mile Tisa, which is about 17km from Namanga town along A104.

The proposed project will build on the existing system by providing/rehabilitating and upscaling key components including river intake works, chlorination of the river water, boreholes, ground and elevated storage tanks, water pipe network and individual connections. The water pipe network and individual connections will be only in selected points. The main works will focus on: storage dam and its appurtenant structures; Water treatment plant; Water transmission mains; Water distribution network; Storage tanks and Rehabilitation of existing water supply system. The water will be supplied to Namanga Town, Maili Tisa Centre, Ngatataek Centre, Bisil Town and all the settlements between these towns.



### 0.3 Objectives of the ESIA

The specific objectives of the ESIA study include:

- To establish the baseline conditions in the project area so as to determine the likely impacts of the project on existing resources and infrastructures
- To identify both positive and negative environmental impacts associated with the project and provide for mitigation measures of the negative impacts.
- Identification and analysis of stakeholders relevant to the project at both national and local levels for purposes of stakeholder consultation
- Preparation of an include an Environmental and Social Management Plan (ESMP) including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.
- Create awareness about the project and obtain opinions and concerns regarding the proposed project i.e. location, design, operation and management through public participation and consultation meetings as per Part II Section 17 of the Environmental (Impact assessment and Audit) Regulations, 2003

### 0.4 Project Methodology

The ESIA team conducted Project Screening and Scoping that identified all the environmental impacts associated with the proposed project. A Terms of Reference for ESIA study was prepared and an approval to undertake ESIA Study was issued by NEMA. (See Appendix for the TOR Approval).

A Stakeholder Engagement Plan was developed as per the mapped stakeholders. Key Informant Interviews were conducted among the Secondary Stakeholders. Public meetings were also held in Namanga and Maili Tisa towns to create awareness about the project and obtain their views. The views of the public and secondary stakeholders are summarised in Chapter Five of this report.

### 0.5 Policy Legal and Regulatory Framework

The following frameworks were reviewed by the Consultant; The Constitution of Kenya, The Kenyan Vision 2030, National Policy on Water Resources Management and Development, Policy Guidelines on Environment and Development, Sustainable Development Goals.

Some of the policies and regulatory frameworks that were reviewed are outlined below:

- a) Water Policy and Regulatory Framework-**
  - National Water Policy,
  - Water Act 2016,
  - Water Quality Regulations, 2006, (Legal Notice No.121),
  - Water Resources Management Rules, 2007
- b) Environmental Policy and Regulatory Framework**
  - National Environment Action Plan Framework,
  - Environment Management & Coordination Act Cap 387



- The Environmental (Impact Assessment and Audit) Regulations, 2003/Legal Notice 31 & 32
- Environmental Management and Coordination (Conservation of Biological Diversity) Regulations 2006
- Environmental Management and Coordination (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulations 2009
- Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007
- Environmental Management and Co-ordination (Waste Management) Regulations, 2006
- Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations 2006
- Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Control Regulations, 2009

## 0.6 Public Participation and Stakeholder Engagement

The assessment involved mapping and identification of key stakeholders in water supply and generally water resource management. The aim was to inform them of the proposed project, seek their opinion and expertise and develop an environmental management plan based on this input. The key stakeholders engaged include: Department of Water services, Department of Environment, National Environment Management Authority, National Government Administration Office-Namanga and Kenya Forest Service. Public consultation involved conducting community meeting at different project sites. This was facilitated by the relevant NGAOs. Additionally, it involved household data collection to establish individual concerns and opinions with regard to the project. The outcome of these meetings and household survey is annexed to this report.

## 0.7 Project Alternatives

This report details an analysis of the major project alternatives which include: dam siting, dam typology, water reticulation system and piping material. Further it includes an evaluation of the no project option which is advantageous from a conservative perspective but not optimal in terms of meeting the water supply needs of the residents of Namanga.

## 0.8 Potential Project Impacts and Proposed Mitigation Measures

Table 0-1: Summary of the potential project impacts and mitigation measures

Construction Phase	Positive Impacts	Negative Impacts
	<ul style="list-style-type: none"> <li>• Job opportunities</li> <li>• Skill transfer to the local communities</li> <li>• Promotes local businesses through sourcing of construction materials locally and other enterprises such as accommodation and catering</li> </ul>	<ul style="list-style-type: none"> <li>• Conflict due to disagreements on wages, piece rate, allocation of employment opportunities</li> <li>• De-vegetation</li> <li>• Land degradation due to excavation activities</li> <li>• Possible risk of forest degradation due during dam construction</li> </ul>



	<ul style="list-style-type: none"> <li>• Improvement of infrastructure e.g. roads that provide access to the project site</li> <li>• Improved livelihoods in the area as money generated from increased businesses in the area and compensation enables the locals to engage in development activities like construction of rental houses, fees for educating children, replenishing of livestock lost during drought</li> </ul>	<ul style="list-style-type: none"> <li>• Noise and vibrations</li> <li>• Solid waste generation</li> <li>• Soil disturbance-hanging gulley and steep</li> <li>• Conflicts due to disgruntled PAPs</li> <li>• Occupational hazards such as falls, fire and other injuries</li> <li>• Increased population influx-insecurity, moral decadence</li> </ul>
Mitigation Measures	<ul style="list-style-type: none"> <li>• Involvement of local leaders in project planning</li> <li>• Establish standard procedures for skilled and non-skilled employment</li> <li>• Institute a grievances and redress committee</li> <li>• Demarcate construction areas and routes to these sites</li> <li>• Rehabilitate disturbed sites</li> <li>• Adhere to the noise and vibrations protocols provided for in regulations</li> <li>• Ensure the environmental assessment report and the RAP is validated</li> <li>• Adopt occupational health and safety guidelines</li> <li>• Community sensitization on security and moral issues that may result from the project</li> </ul>	
Operation Phase	<b>Positive Impacts</b> <ul style="list-style-type: none"> <li>• Regular supply of quality water to the Namanga residents</li> <li>• Reduced cases of water borne diseases among the locals</li> <li>• Improvement of livelihoods</li> <li>• Improved local economic development</li> <li>• Access to water for livestock</li> <li>• Improved number of children enrolling in schools</li> <li>• Increased revenue to OLWASCO &amp; OWASCO</li> <li>• Institutional strengthening &amp; Capacity building for the water companies</li> </ul>	<b>Negative Impacts</b> <ul style="list-style-type: none"> <li>• Hazards posed by dam to people and wild animals due to falls or dam breakage</li> <li>• Increased cases of malaria infections at the dam area</li> <li>• Macroclimate alteration</li> <li>• Loss of income among water vendors</li> <li>• Insecurity issues such as destruction of water pipes, vandalism of equipment</li> <li>• Illegal connections</li> <li>• Water contamination -dam site or along the pipeline</li> </ul>
Mitigation Measures	<ul style="list-style-type: none"> <li>• Fencing of the dam</li> <li>• Put up communal water points for livestock</li> <li>• Ensure adequate sensitization among the beneficiaries</li> <li>• Engage all stakeholders to promote project ownership and support</li> <li>• Put up proper solid waste management systems like use of licensed solid waste collectors</li> </ul>	



	<ul style="list-style-type: none"><li>• Put up measures to ensure minimal pollution</li><li>• Contractors to be straightforward and work with local leaders</li><li>• Ensure 24Hours security at the Dam area</li><li>• Consider alternative sources of energy to ensure consistent water supply</li></ul>
Recommendations	<ul style="list-style-type: none"><li>• During the construction phase, allow the county to have an officer as part of the management and be actively involved in the site meetings</li><li>• Establish a disaster management office to run the emergency action plan</li><li>• Ensure public participation in all project stages</li><li>• Tanathi should be actively involved in the project from the planning, design, construction to commissioning and ensure adequate funding is available throughout the project cycle.</li><li>• Engage the local leaders to create a ‘buy in’ and project support to ensure sustainability</li></ul>



## 1 INTRODUCTION

### 1.1 Project Background

Namanga Town like many urban centres in arid and semi-arid areas is characterized by low access to improved water and sanitation services. This is attributed to erratic rainfall patterns, frequent and extended drought periods, population increase and low investment in water and sewerage infrastructure. Lack of adequate water supply and sanitation services results to public health, social, economic and environmental challenges. Recognizing the importance of these services, the 2010 Kenyan Constitution entrenched water as a constitutional right by establishing a right to “reasonable standards of sanitation” and “clean and safe water in adequate quantities”. The constitution under Article 21 further places an obligation on the government to take steps to progressively realize this right.

Kenya’s Vision 2030 for water and sanitation seeks to ensure that improved water and sanitation is available and accessible to all. The goal of the Third Medium Term Plan is to improve access to water and sanitation, have an innovative self-financing mechanisms for the sector, and adequate investment planning to move the water sector into the path of Vision 2030. The economic, social, and political pillars of the vision 2030 are further anchored on infrastructure as one of the key foundation for the Vision 2030. Therefore, water and sanitation facilities are a critical impetus to achieving the development initiative of the country. It is against this background that under the funding by Government of Kenya through the Ministry of Water, Sanitation and Irrigation, Tanathi Water Works Development Agency (TAWWDA) intends to develop Namanga Dam Water Supply and Sanitation Project to improve the current situation and provide for future water supply and sanitation needs of the Project area.

TAWWDA is one of the Nine Water Works Development Agencies in Kenya that are responsible for the development, maintenance and management of water and sewerage infrastructure. The Agency serves Kitui, Makueni, Machakos, and Kajiado Counties. In line with this mandate, TAWWDA has engaged an Engineering Consultant, Ms. Runji Consulting Group Ltd to undertake: “**Detailed Designs and Tender Documentation for Namanga Dam Water Supply and Sanitation Project.**” The Consultant will also undertake an Environmental and Social Impact Assessment and prepare the Resettlement Action Plan (RAP) of Project Affected Persons (PAPs).

### 1.2 Project Justification

Namanga Town and its environs fall under the arid and semi-arid lands (ASAL). The area receives low rainfall, experience frequent dry periods, seasonal rivers and has an acute shortage of clean water supply. The problem is compounded by the increased urban population occasioned by border activities and the positive fruits of devolution which has created opportunities in what was small market centres and towns turned into busy commercial centres and local government administrative centres. The reality therefore, is that people in these urban



areas do not have enough water to maintain the enhanced hygiene practices required. The water supplies are also unreliable requiring rehabilitation and augmentation, while still, majority of the schemes are pumping systems which present O & M cost challenge. In this regard, there is a need to develop Namanga Dam in order to boost water supply within the project area.

### **1.3 Purpose of the Study**

The implementation of service infrastructure provides multiple benefits to both the targeted community and the country as well. These benefits include improved service access, enhanced public health, improved livelihoods and economic development. More specifically, construction of water infrastructure will help in improving accessibility of clean water to residents, ensuring consistent water supply and improved sanitation among residents. However, it is notable that the construction and operation processes may generate negative environmental and social impacts. Such negative effects if not properly managed may obscure the realization of benefits anticipated from the proposed development. It is therefore paramount that a comprehensive assessment of possible negative impacts is undertaken to identify mitigation measures and safeguards that need to be instituted during the project period.

In an attempt to ensure that development provides optimal benefits without creating a significant social and environmental burden, the Government of Kenya has put in place wide range of policy, institutional, and legislative framework to address major causes of environmental degradation and negative impacts on ecosystems deriving from development programs. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound. It is an obligation of the Kenya Government to conduct an Environmental and Social Impact Assessment (ESIA) on development projects such as the proposed Namanga Dam Water Supply and Sanitation Project. The ESIA assesses the impacts of a proposed project before commencement of implementation. In addition to helping formulate environmental management framework, EIA provides for public participation in the decision-making process within the proposed project.

### **1.4 Objectives of the Study**

The specific objectives of the ESIA study include:

- To establish the baseline conditions in the project area so as to determine the likely impacts of the project on existing resources and infrastructures
- To identify both positive and negative environmental impacts associated with the project and provide for mitigation measures of the negative impacts.
- Identification and analysis of stakeholders relevant to the project at both national and local levels for purposes of stakeholder consultation
- Preparation of an include an Environmental and Social Management Plan (ESMP) including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.

- create awareness about the project and obtain opinions and concerns regarding the proposed project i.e. location, design, operation and management through public participation and consultation meetings as per Part II Section 17 of the Environmental (Impact assessment and Audit) Regulations, 2003

### **1.5 Scope of the Study**

In accordance with the ToR, the scope of the assignment entails:

- Detailed description of the proposed project
- Assessment of the baseline conditions in the project area
- Analysis of the relevant policy, legal and regulatory frameworks
- Analysis of alternative to the project site, design and inputs
- Identification of anticipated social and environmental impacts and their mitigation measures during the construction, operation and decommissioning phase
- Development of an environmental and social management plan

### **1.6 Approach and Methodology**

The ESIA study utilized a systematic approach to identify the environmental and social impacts of a project, and describing the mitigation, management and monitoring measures that will be implemented to address these impacts. The approach also entailed stakeholder engagement. Ultimately, the study allows relevant organizations to make informed decisions about development proposals, and potentially affected stakeholders to participate in the process.

#### **1.6.1 ESIA Process**

##### **1.6.1.1 Screening**

It comprises of the initial identification of potential interactions between the Project and physical, ecological and human receptors indicating the level of impact assessment required. It also involves examination of relevant national and international legislative requirements and an illustration of the potential interactions of project activities with the physical, ecological and human receptors.

##### **1.6.1.2 Scoping**

This stage outlines the perceived required scope of the ESIA to be undertaken, taking into consideration the nature of the Project, the results of the screening and applicable requirements. This stage included:

- a) **Issues Identification**- a process of systematic identification of potential interactions between Project activities or events and known receptors
- b) **Desk-Based Studies**- a review of existing environmental and social information, and gap analysis to identify additional baseline information required for the impact assessment. Some of the reports reviewed include the Feasibility Study Report (2020)

undertaken by Seven Seas Consultants Ltd, Kajiado County Integrated Development Plan 2018-2022, and the Kajiado County Spatial Plan 2019-2029.

- c) **Identifying receptors-** Identification of potential physical, ecological, and human receptors that may be affected by the Project
- d) **Analysis of Alternatives-** undertaking an analysis of technically and financially feasible alternatives for the proposed sites for the dam, Water treatment plant, water transmission mains, waste water treatment plant and the sewer network.

### 1.6.1.3 Baseline Field Surveys and Studies

Field Studies included:

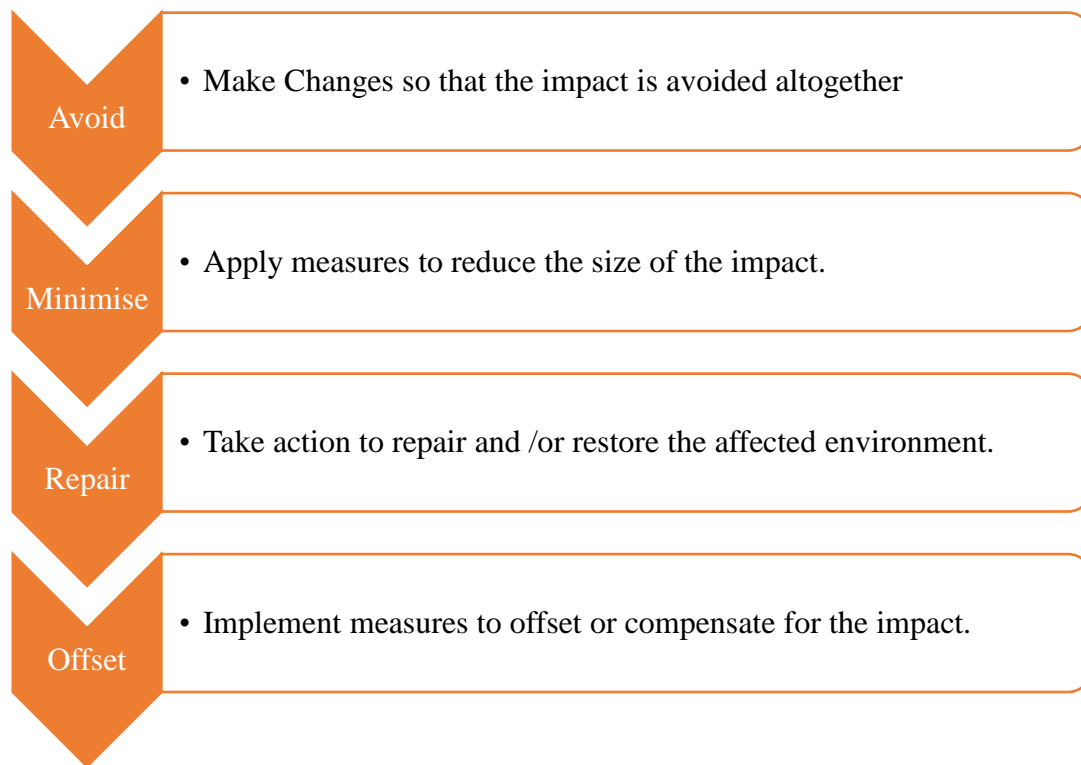
- **Hydrological Analysis:** This is an analysis of meteorological data, catchment delineation, and reservoir volume particularly to understand the environmental flows, flood frequency and sediment load analysis.
- **Geotechnical assessment:** This involves detailed soils and materials investigations which include trial pitting, laboratory tests for foundation characteristics of the various structures and for construction material sourcing.
- **Baseline Survey:** The Consultant will undertake a household survey within the project area to understand the existing socio-economic conditions. The information will be used in assessing how livelihoods will be affected especially due to displacements.
- **Asset Inventory:** The Consultant will obtain cadastral maps, determine land tenure, identify the registered landowners of the affected private land parcels and develop a record of structures, crops, trees as well as costing.

### 1.6.2 Impact Assessment Framework

The process of assessing the potential project impacts is centred on the following aspects:

- Prediction-What will happen to the environment because of this project?
- Evaluation-Will it have a beneficial or adverse effect? How big is the change expected to be? How important will it be to the affected receptors?
- Mitigation: If the impact is of concern, can anything be done to avoid, minimise, or offset the impact or to enhance potential benefits?
- Residual Impact: After mitigation, is the impact still of concern?

The hierarchy as illustrated in the chart below will inform the mitigation measures:



Environmental and Social Management Plans (ESMPs) are developed to capture all mitigation and management measures, and environmental and social commitments made within the ESIA Report. Adherence to these plans will be a condition of any Project construction and operation contracts awarded.

### 1.6.3 Stakeholder Engagement

The ESIA team will map out the relevant stakeholders who are likely to be affected by the proposed project either directly or indirectly. A stakeholder analysis will be conducted to determine their level of power and interest in order to know the best approach for engaging them and the significance of their input to the project. A Stakeholder Engagement Plan has been developed and the feedback from the stakeholders is discussed in detail in Chapter five of this report.

## 1.7 Structure of the Study Report

Environmental and social impact assessment will include:

**Executive summary:** This section presents a summary of the entire report.

**Chapter 1: Introduction:** This chapter gives description of the Project Background, Project History, Consultants Assignments and TORs, Justification of the Project, Study Methodology and Field Findings, and Scope and Content of the project.

**Chapter 2: Project description:** This chapter gives a description of the status of the project in the project cycle, specifically during construction, operation and decommissioning.





**Chapter 3: Policy, legal and institutional / administrative framework:** This chapter outlines the overview of legislative framework, regulatory, international guidelines and conventions relevant to this project.

**Chapter 4: Environmental setting:** This chapter gives description of the environmental setting of proposed project and surrounding areas, e.g., climate, soils, geology, vegetation, fauna, land use, human populations, socio-economics, cultural heritage.

**Chapter 5: Stakeholder Engagement:** This chapter gives description of the objectives, methods used and summary of results of the public consultation activities undertaken during the ESIA.

**Chapter 6: Analysis of alternatives:** This chapter gives a description of the project details of the proposed project, alternative options, designs and implementation strategies.

**Chapter 7: Assessment of environmental impacts and mitigation measures:** This chapter presents the analysis of beneficial and adverse impacts of the project on the biophysical and human (social, cultural and economic) environments. The analysis covers anticipated impacts during the construction, operation phases and decommissioning phases and describes the enhancement and mitigation measures proposed to enhance benefits.

**Chapter 8: Environmental and social management and monitoring Plans:** This chapter presents the proposed Environmental and Social Management and Monitoring Plans prepared for the project.

**Chapter 9: Conclusion and recommendations:** The conclusion briefly presents the environmental and social acceptability of the project, taking into account the impacts, measures and recommendations identified during the assessment process.

**Appendix and Annex:** This section presents attached documents such as Minutes and supplementary reports.

## 2 PROJECT DESCRIPTION

### 2.1 Project Location

#### 2.1.1 General Project Area

Namanga Dam Water Supply and Sanitation Project is located in Oloililai Sub County in Kajiado County. It will cover Namanga Town, Maili Tisa, Ngatataek and Bisil town centres and the settlement areas. Namanga Town (UTM Zone 37M Co-ordinates 253 894E, 9 718 151 N) is located at the Kenya-Tanzania border. It is about 139km South-south East of Nairobi city and about 85km South of Kajiado Town via the A104 Nairobi-Namanga road.

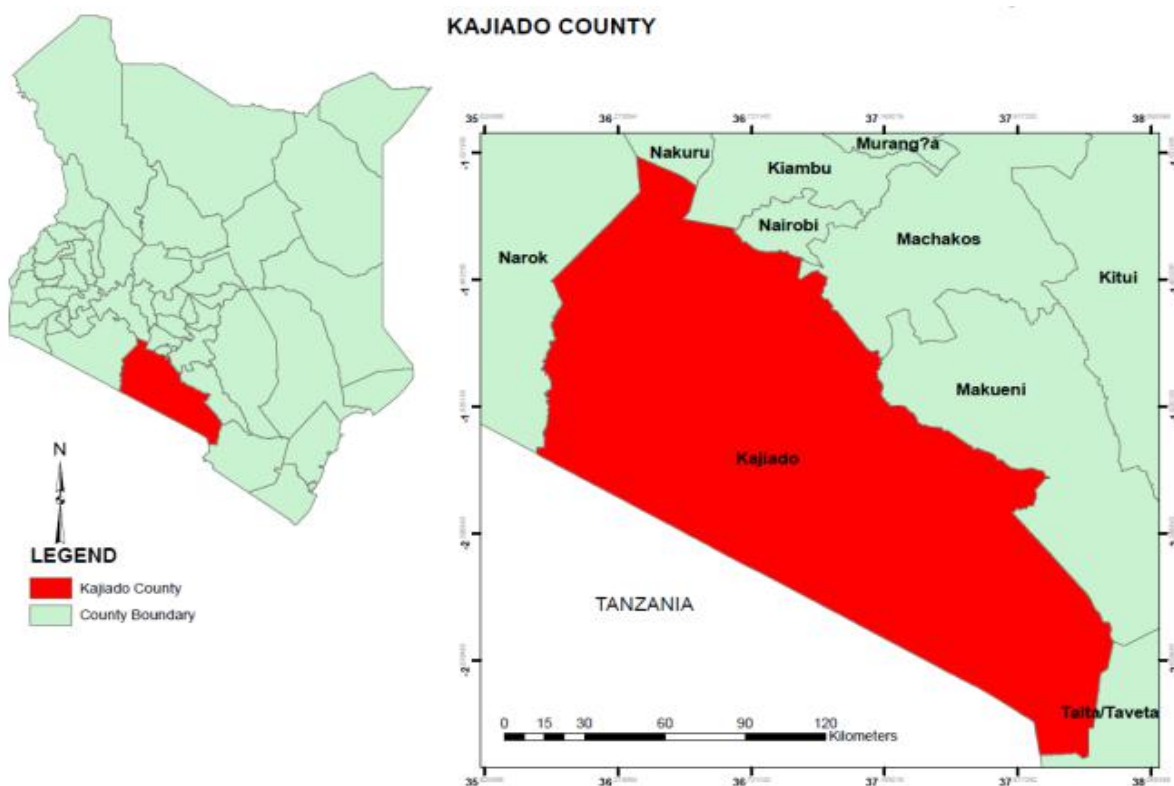


Figure 2-1: Map of Kajiado County

#### 2.1.2 Location of the Proposed Dam

The dam site is located at a distance of approximately 22km from Namanga Town, to the north of the town. It is about 6km from Mile Tisa centre, to the western side of the centre. The dam axis is at approximately coordinates 255820 E, 9729302 N, Arc 1960 / UTM zone 37S (latitude 2°26'59.57"S, Longitude 36°48'17.76"E).

### 2.1.3 Location of the Proposed Water Supply System

The proposed dam will supplement the existing water supply which currently include river intake and boreholes. The Project supply area is mainly within Kajiado Central constituency. The Project mainly covers Matapato south and Matapato north wards. It will also supply sections of Entonet/Lenkisim, Purko, Dalalekutuk, Ildamatildamat, Keekonyokie, Ildamat and Illoodokilani wards.

The key urban centers in the supply area are; Namanga Town, Maili Tisa Centre, Ngatataek Centre, Bisil Town and all the settlements between these towns.



Figure 2-2: Proposed project area for Dam site and Water Supply

## **2.2 Project Components**

The main project components are the dam, water treatment plant and the reticulation system. The design work these components is undertaken in accordance with relevant Kenyan Standards, International Commission on Large Dams (ICOLD) publications, Practice Manual for Water Supply Services in Kenya, Published in October 2005 (MoWI, 2005), USBR and other guidelines, and current dams engineering practices.

### **2.2.1 Dam**

#### **2.2.1.1 Dam Type**

The proposed dam type is Rock-fill dam with an impervious central core. This is based on physical characteristics of the selected dam site including: topography, geology and foundation, dam construction materials availability, hydrology, climate, earthquake activity, potential options for spillway, necessary power/ water supply outlets, the options for river diversion during construction, availability of labour and equipment, accessibility of the site and dam safety issues.

#### **2.2.1.2 Dam components**

The main component of the dam comprises the followings:

- i) Rock-fill dam with central vertical impervious core. The dam includes, filters, drains, wave protections and all necessary instrumentations
- ii) Water Supply Intake Tower: The intake will include all hydro-mechanical, electrical and other facilities to regulate the water from the dam crest level towards the Raw water transmission pipe to the water treatment plant.
- iii) Diversion culvert as well as diversion arrangement: One concrete conduit for flood diversion during construction.
- iv) Spillway: Surface frontal flow type ogee profile control weir and chute

#### **2.2.1.3 General Layout of Structures**

The Namanga rock-fill dam layout is organized in such a way that, spillway structure is located out of the dam body situated at the right side, and without considerable connection with the embankments. However, since water supply main pipe/ bottom outlet are taking water from lower elevations at reservoir dead storage level (DSL) and at river bed level respectively, locating them outside of the dam body is very costly. Hence the water supply main transmission pipe / bottom outlet is designed to under the dam, through cut and fill with concrete below the dam foundation.

#### **2.2.1.4 Normal Water Level (NWL) / Full Supply Level (FSL)**

Water balance analysis of the present study showed that, considering the maximum use of Namanga river for the proposed dam, the required maximum live storage volume is 0.89 Mm<sup>3</sup>. On the other hand, as in the hydrology study report, assuming that the annual sediment inflow

to the reservoir of  $0.0064 \text{ Mm}^3$ , the required dead storage volume for the design period of 50 years is  $0.32 \text{ Mm}^3$ . This requires Namanga dam Dead Storage Level (DSL) to be at EL. 1319.5 masl. Finally, the Full Supply Level of the reservoir (FSL) fixed to be at EL. 1329.0 masl. At this Full Supply Level, the reservoir will inundate  $0.121 \text{ km}^2$  area.

#### **2.2.1.5 Namanga Dam Hazard Classification**

Namanga dam has downstream rural settlement (Mail Tisa area). Therefore, considering population at risk and economic losses, the dam is classified as high hazard. The study has not identified presence of high-risk elements at site. However, possible flash floods have not been ruled out. Therefore, the dam is classified High hazard - significant risk level as per USBR (1990) guidelines

#### ***Dam height and its crest level***

The maximum freeboard (1.04m) gives the larger dam crest elevation requirement, hence, the design dam crest level (including necessary camber) provided to be at elevation of 1332.20 masl, resulting in a maximum dam height above the river bed level of 23.20m

#### ***Dam Embankment***

Based on available data on rock material characteristics and nature of impervious section of the dam body, 2.0H to 1.0V slope and 1.8H to 1.0V slopes have been considered for u/s and d/s embankment slopes respectively. Preliminary checking of these slopes has been done by slope stability analysis. Slopes shall be further optimized after foundations investigations after drilling, by running the slope stability model with the refined foundation and construction material parameters.

### **2.2.2 Water Treatment and Supply Work**

The treatment works has been designed for a capacity of  $6,000 \text{ m}^3 / \text{d}$  which is 86% of the ultimate demand. This is the design output for the dam for water supply. Full conventional treatment is proposed. This comprises coagulation/flocculation, horizontal flow sedimentation tanks, rapid gravity sand filtration with air/water backwashing and disinfection using chlorine will be the most appropriate. The various units are arranged such that the flow will be entirely by gravity. The units provided are as follows:

#### ***a) Inlet Chamber Raw***

Water will be discharged into the chamber through a flow regulating valve. A baffle wall will be included to break the energy of the incoming raw water. A sharp crested rectangular measurement weir will be installed within the inlet chamber, with calibrated staff appropriately located next to the weir to enable a secondary measurement of flow into the treatment works. The bottom of the weir will have sufficient head above the bottom of the mixing channel so that as the water falls, it gains enough energy to create turbulence to facilitate instant and homogeneous mixing of coagulating chemicals.



**b) Chemical Mixing and Dosing**

Dosing equipment consisting of mixing tanks and gravity dosers will be located inside the Chemical Building located near the dosing points at the inlet chamber. These will consist of two sets of twin tanks of 1.0m<sup>3</sup> effective capacity for alum and lime, two gravity dosers and the connecting pipework. Raw water will be dosed with alum for coagulation, and with soda ash as necessary for pH adjustment. This will be carried out from the chemical dosing platform in the chemical building. The construction of this will enable gravity dosing. At the inlet to the contact/balancing tank, filtered water will be disinfected using tropical chloride of lime, while soda ash will be added as necessary for pH correction. At this location, the dosing equipment will consist of one set of twin tanks of 1.0m<sup>3</sup> effective capacity for alum and lime, gravity dosers and the connecting pipe work. Dosing will be effected from a dosing platform constructed to enable dosing by gravity.

**c) Flocculation**

Flocculation will be carried out through two gravity horizontal sinuous flow basins in parallel. From the inlet chamber, water will flow through a distribution channel to the flocculation basins. The flocculation basins will give the necessary gentle agitation to enable formation of flocs

**d) Sedimentation**

Sedimentation of the flocculated water is achieved using 2No. horizontal flow tanks, each 17.4m x 5.8m, depth varying from 2.5m to 3.0m. Flow into each tank will be controlled through manually operated penstocks located at the inlet chambers to the sedimentation tanks. These valves will also be used to isolate each tank during cleaning and maintenance operations. Flocculated water will enter the sedimentation tanks through a vertical stilling wall which has 100mm diameter openings lined with uPVC pipe. These openings are spread evenly over the height of the wall to ensure even distribution of flow across the cross-section of the sedimentation tank. This will minimize short circuiting possibilities and will also ensure that the flow velocity across the wall is low enough to prevent breaking of flocs.

**e) Filtration**

The filtration process adopted is rapid gravity sand filtration in which the decanted water is filtered by gravity through sand beds. Settled supernatant water from the settling tanks will be conveyed through a channel with a 400mm diameter inlet control penstock into each filter bed. A walkway over the channel (of removable precast concrete slabs) is provided to enable operation of the penstocks.

**f) Disinfection**

It is proposed that disinfection will be carried out using Calcium Hypochlorite which is readily available and provides residual disinfection action for some time. Chlorine mixing and dosing is carried out in Chemical Building, where chlorine is also stored, using treated water. There





are two tanks for mixing Hypochlorite powder (so that one can be used when mixing is being done in the other) each 1.2m x 1.2m x 1.0m deep. For each tank, one gravity doser is provided to regulate the flow for dosing.

**g) Clear Water / Chlorine Contact Tank**

The Clear Water Tank is a reinforced concrete square tank 25m each and 3.6m high. The capacity of the tank is 1000m<sup>3</sup> which provides more than the minimum recommended contact time of 30 minutes.

**h) Backwash Water Tank**

The backwash tank is a concrete ground tank near the staff housing on the highest elevation at the treatment works site to the North West. The capacity of this tank is 212m<sup>3</sup> and provides water by gravity for backwashing, mixing chemicals and domestic use on site

**i) Sludge Drying Beds**

2No. Sludge Drying Beds, 1.25m deep and with a total area of 200m<sup>2</sup>, are provided for sludge from the sedimentation tanks. The sludge drying beds consist of slotted pre-cast concrete slabs laid on an 80mm thick layer of sand (size 1 -3mm) below which is an 80mm layer of size 10 - 15mm gravel. Underneath the sand and gravel are large stones (size 20mm - 35mm, minimum 200mm thick) surrounding an open-jointed pre-cast concrete pipe, laid to falls, for collecting the filtrate

### **2.2.3 Water Supply Reticulation**

The general considerations for the water supply component include:

- a) A gravity fed supply will be preferred whenever technically, economically and financially feasible.
- b) Balancing tanks will be incorporated in the system in order to cut down peak flows. The position of and the capacity of each tank should be determined after economic analysis aiming at minimizing the system cost.
- c) A pipe traversing a supply area will be designed for the peak flow of that area plus the mean flow of succeeding areas.
- d) The static pressure should be kept low by breaking the pressure preferably in the balancing tanks or in separate break-pressure tanks.
- e) The number of major high points and low points should be kept to a minimum where possible by trying to follow the contour lines of the terrain rather than only roads and tracks. This calls for active participation by the design engineer in the survey of the pipeline routes. For large size pipes (150mm) alternative routes may have to be surveyed for an economic analysis in order to find the optimal alignment.
- f) The excavation depth should be varied to avoid local high and low points in order to minimize the number of air-valves and washouts.

- g) The pipeline should be set out by the Resident Engineer who also should check that the pipe levels are strictly in accordance with the drawings

### 2.2.3.1 Water Supply Zones

In The Project Topographical requirements were given priority as the zoning criteria due to the project's fluctuating terrain, with Bisil being the highest point and the need to pump the treated water to heads of over 400m. As a result, a combination of gravity and rising mains were designed. A total of 6 zones have been designated for reticulation. The detailed zoning that indicates villages and locations covered in each zone is as shown in Figure 2-3 below.

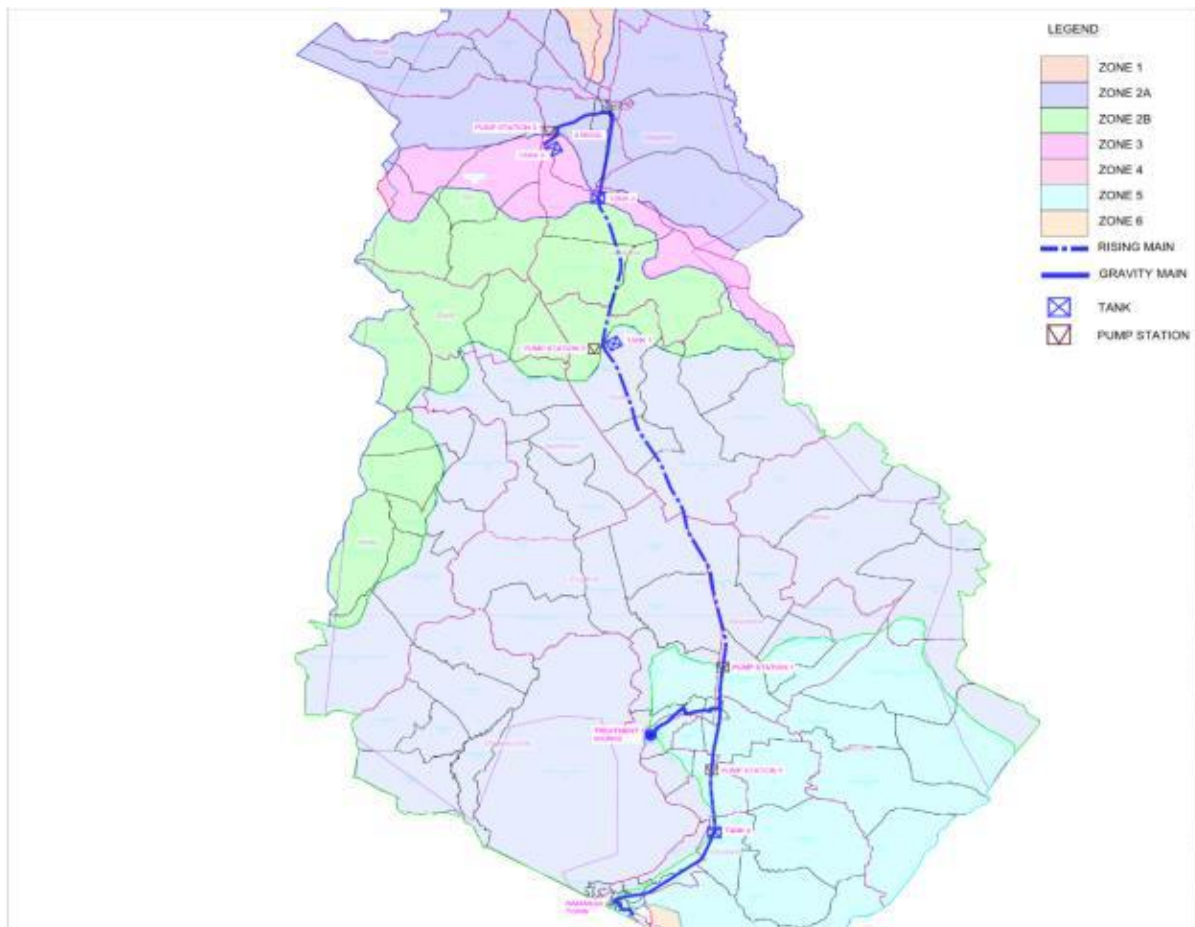


Figure 2-3: Namanga Water Supply Zonation

### 2.2.3.2 Capacity of Water Mains

#### a) Raw Water Main

The raw water pipeline is designed to deliver 6,000 m<sup>3</sup> /day to the Treatment plant which includes 10% of the required demand for backwashing and use on site. The pipeline whose length is 156.92m to the water treatment plant's inlet, is designed to be made of HDPE material of 350mm diameter and a pressure rating of PN.

#### b) Transmission Mains to Bisil Route

A gravity main with a 55.7 l/s discharge serves as the starting point of the transmission main to Bisil. The main starts at an elevation of 1308.99m, and terminates at an elevation of 1289.67m at Nemasi Village, Noosikitok Sub location along the A104 road at point (260566.20E,9732548.893N). The main is 6761.83 meters long and designed to be composed of HDPE material, of 355 mm diameter, and a pressure rating of PN10. At the point of termination of the gravity line a pump station is set up to pump water through a 254.48m head, through a rising main of length 19190.91m with a 55.7 l/s discharge, designed to be composed of HDPE material, 400 mm diameter, and a pressure rating of PN25. The rising main terminates at pump Station 2 which is located at Oloililai Sub location Meidanyi Village along the A104 road at point (255384.041E,9750343.584N). At the terminal is a tank (Tank 1) of volume 1000m<sup>3</sup> that serves two-thirds of demand zone 4 by gravity as a third of the zone is served through the Namanga Distribution network. Pump station 2 then pumps water through a 11111.76m rising main with a 29.4 l/s discharge, and is designed to transport water through a HDPE pipe, of diameter 280mm and a pressure rating of PN8. The line terminates at Tank 2 in Lenkishon Sub location along the A104 road at point (254367.742E,9760925.668N).

#### **c) Transmission Mains to Namanga Route**

A gravity main with a 19.7 l/s discharge serves as the starting point of the transmission main to Namanga. The gravity main starts at an elevation of 1308.99m, and terminates at an elevation of 1293.40m at Inkati Village, Namanga Sub location along the A104 road at point (260073.346E,9727439.816N). The main is 9397.2 meters long and designed to be composed of HDPE material, of 250mm diameter, and a pressure rating of PN12.5. At this point a booster station (Pump station 4), Pumps the water through a rising main of HDPE material and diameter 160mm of a pressure rating of PN10 through a length of 3940m, to Tank 4 of volume 500m<sup>3</sup> which serves two-thirds of demand zone 5 by gravity. The remaining one-third of demand zones 5 and 4 are to be served through transmission main of length 9038.8m, the gravity main is segmented into three sections, the first section of length 7575m and of HDPE 160mm diameter, pressure rating PN10 terminates at point (254550.9834E,9719185.408N) where there is an offtake of discharge 1.93L/s to the distribution System. The gravity main continues for a length of 1463.8m with a HDPE pipe of 140mm diameter, pressure rating PN8 that terminates at point (255522.3923E,9718334.402N). There is an offtake of discharge 4.9L/s to the distribution to be located at point (255102.487E,9718621.644N).

#### **2.2.3.3 Storage Tanks**

The storage tanks are designed to have sufficient storage to cover the difference between hourly peak demand and actual supply from the source, firefighting demands and emergency volume in case of break down, repairs or operation and maintenance activities for reservoirs supplied from sources through pumping system. The reservoir size is determined by applying the minimum storage recommended by the MoWI manual and by considering reliability of pumps in the project area. The recommended minimum storage size, according to the Design Manual by the MoWI, 2005, clause 9.3.2 for principal towns and urban centre's is about 50% of the maximum daily demand.



Table 2-1: Water storage tank locations

Tank ID	Location Easting	Location Northing	Volume (M <sup>3</sup> )	Tank Size Dimensions
1	255384.041	9750343.6	1000	L(16m)×W(16m)×D(5m) .H=0m
2	254367.742	9760925.7	500	L(11.7m)×W(11.7m)×D(5m).H=0
3	250453.214	9766271.1	100	d(6.6m)×D(3.4m).H=0
4	260235.321	9723517.2	500	L(11.7m)×W(11.7m)×D(5m).H=0

#### 2.2.3.4 Water Transmission and Distribution

The design of the water distribution will consider the existing water sources as well as the dam which will be a hybrid of pumping and gravity fed system. The water transmission works will majorly involve rehabilitation of existing transmission and distribution systems

Table 2-2: Rehabilitation works to be undertaken on existing water supply system

Component	Identified Issues	Comment
<b>Treatment Plant</b>	<ul style="list-style-type: none"> <li>No Water Treatment Plant</li> </ul>	<ul style="list-style-type: none"> <li>There is need of a WTP for the Town</li> </ul>
<b>Transmission Lines</b>	<ul style="list-style-type: none"> <li>Comprise of Steel pipes which are dilapidated</li> <li>Lengths and type of existing pipelines not determined</li> </ul>	<ul style="list-style-type: none"> <li>Need to be replaced with HDPE pipes</li> </ul>
<b>Distribution Lines</b>	<ul style="list-style-type: none"> <li>Consist of uPVC pipes</li> <li>Experience frequent bursts and vandalism</li> <li>Lengths and type of existing pipelines not determined</li> </ul>	<ul style="list-style-type: none"> <li>Need to be replaced with HDPE pipes</li> </ul>
<b>Storages</b>	<ul style="list-style-type: none"> <li>Inadequate to serve the current, future and ultimate demands</li> </ul>	<ul style="list-style-type: none"> <li>Construction of new storage tanks at higher locations to enable distribution by gravity</li> </ul>

## 2.3 Project Classification

According to the Environmental Management and Coordination Act, No. 8 of 1999, projects should be classified as either Low Risk Project, Medium Risk Project or a High Risk Project. An analysis of the Namanga Dam Water Supply and Sanitation Project as per the Second Schedule of the EMCA Act shows that the project will be classified as both Medium Risk Project and High Risk Project.

The **Dam** is classified as a **High Risk Project** because it is a water resource and its related infrastructure that includes reservoir, river diversion will cause changes in land use in the project area. The proposed dam is set to be constructed within the Namanga Forest-a forest reserve, which implies that it will lead to clearance of forest areas.

The **Water Supply System** is classified as a **Medium Risk Project** as it qualifies under the water infrastructure aspect that involves water supply and distribution to consumers.

## 2.4 Total Project Cost

The total project cost is for the proposed project is estimated at one billion, two hundred and forty million Kenya shillings.

Table 2-3: Total Project Cost

BOQ No.	Description	Amount KES.
1	TRANSMISSION MAINS	706,835,584.9
2	DISTRIBUTION SYSTEMS	54,723,807
3	TANKS	80,000,000
4	PUMPS	110,000,000
	<b>Sub Total</b>	<b>951,559,391.9</b>
	Add 30% for Escalation and Contingencies	285,467,817.6
	<b>Grand Total</b>	<b>1,237,027,209</b>





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

#### **3.1 Introduction**

##### **3.1.1 The Constitution of Kenya**

The Constitution is the supreme law of the Republic and binds all persons and all State organs at all levels of government. In relation to the environment, article 42 of chapter one, *The Bill of Rights*, confers to every person the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative measures, particularly those anticipated in Article 69, and to have obligations relating to the environment fulfilled under Article 70. In addition, Article 21 entrenches water as a constitutional right by establishing a right to “reasonable standards of sanitation” and “clean and safe water in adequate quantities”. This article places an obligation on the government to take steps to progressively realize this right.

##### **3.1.2 The Kenyan Vision 2030**

The Kenya Vision 2030 is a policy document outlining Kenya’s development programme covering the period between the years 2008 to the year 2030. The objective of Vision 2030 is to help transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens in a clean and secure environment by 2030. Additionally, the Kenya Vision 2030 also has environmental goals outlined under the social pillar. According to the pillar, Kenya aims to be a clean, safe and sustainable environment by 2030. The country aims to achieve this goal by for example, improving pollution and waste management strategies. By commissioning an environmental impact assessment study for the project, the proponent has displayed his desire to support the Kenya Vision 2030. Further, the development blue print seeks to ensure that improved water and sanitation is available and accessible to all. The main goal is to improve access to water and sanitation, have an innovative self-financing mechanism for the sector, and adequate investment planning to move the water sector into the path of Vision 2030. The economic, social, and political pillars of the vision 2030 are further anchored on infrastructure as one of the key foundations for the Vision 2030.

##### **3.1.3 National Policy on Water Resources Management and Development**

While the national Policy on Water Resources Management and Development (1999) enhances a systematic development of water facilities in all sectors for promotion of the country’s socio-economic progress, it also recognizes the by-products of this process as wastewater. It, therefore, calls for development of appropriate sanitation systems to protect people’s health and water resources from institution pollution. Industrial development projects, therefore, should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating there from.

The same policy requires that such projects should also undergo comprehensive EIA/EA that will provide sustainable measures to be taken to ensure environmental resources and peoples’



health in the immediate neighbourhood and further downstream are not negatively impacted by the emissions.

In addition, the policy provides for charging levies on wastewater on quantity and quality (similar to polluter-pays-principle) in which those contaminating water are required to meet the appropriate cost on remediation, though the necessary mechanisms for the implementation of this principle have not been fully established under the relevant Acts. However, the policy provides for establishment of standards to protect water bodies receiving wastewater, a process that is ongoing.

#### **3.1.4 Policy Guidelines on Environment and Development**

Among the key objectives of the Policy Paper on Environment and Development (Sessional Paper No.6 of 1999) are: -

- a) To ensure that from the onset, all development policies, programmes and projects take environmental considerations into account,
- b) To ensure that an independent environmental impact assessment (EIA) report is prepared for any industrial venture or other development before implementation,
- c) To come up with effluent treatment standards this will conform to acceptable health standards.

Under this paper, broad categories of development issues were covered that require sustainable approach. These issues include the waste management and human settlement sectors. The policy recommended the need for enhanced re-use/recycling of residues including wastewater, non-waste technologies, increased public awareness raising and appreciation of clean environment. It also encourages participation of stakeholders in the management of wastes within their localities.

#### **3.1.5 Sustainable Development Goals**

Goal number eleven of the global sustainable development goals, talks of making cities inclusive, safe, resilient and sustainable. Some of the goal's targets which are relevant to the project include: to ensure access for all to; adequate, safe and affordable housing and basic services and upgrade slums by 2030 and to enhance inclusive and sustainable urbanization and capacity for sustainable human settlement planning in all countries by 2030.

### **3.2 Water Policy and Regulatory Framework**

#### **3.2.1 National Water Policy**

The National Policy of Water which was promulgated in April 1999 as Sessional Paper No. 1 of 1999 calls for decentralization of operational activities from the central government to other sectors, including local authorities, the private sector and increased involvement of communities in order to improve efficiency in service delivery. It also tackles issues pertaining to water supply and sanitation facilities development, institutional framework and financing of

the sector. The overall objective of the National Water Policy is to lay the foundation for the rational and efficient framework for meeting the water needs for national economic development, poverty alleviation, environmental protection and social wellbeing of the people through sustainable water resource management.

### **3.2.2 Water Act, 2016**

The Water Act 2016 provides for the management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water. Under this provision, the responsibility to regulate access, use and control of water resources is vested with the Water Resource Authority (WRA). Further it provides for the inclusion of communities living along the water resources in development projects. The Water Resource User Association (WRUA) are for consideration of project impacts on the community.

Part II section 18 of this act provides for the national monitoring and information systems on water resources. Sub-section 3 of this allows the water management authority to demand from any person or institution, specified information samples or raw material on water resources. Under these rules, specific records may require to be kept by a site operator and the information made available to the authorities as and when required.

Section 73 of the act allows a person with a license to supply water to make regulations for purposes of protecting against degradation of water resources. Section 75 allows the licensee 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 pollution of water within their jurisdiction. In Kenya, water is regarded as a national resource and is therefore owned by the state for and on behalf of the people (Section 3).

Section 36 requires applications for permit made in case of proposed diversion, abstraction, obstruction, storage or use of water from a water body.

### **3.2.3 Water Quality Regulations, 2006, (Legal Notice No.121)**

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.

No person is allowed to abstract water from a natural water body for domestic purposes unless such water meets the standards set out in the First Schedule.

These regulations provide for the protection of lakes, rivers, streams springs, wells and other sources. The overriding objective of the regulations is to protect human health and the environment. Proper enforcement of the regulations can lead to marked reduction in water-borne diseases. The regulations provide guidelines and standards for the discharge of poisons, toxins, radioactive and other pollutants into the aquatic environment. Standards have also been set for discharge of effluent into the sewer and aquatic environment. The National Environment Management Authority regulates discharge into the aquatic environment.

Persons (real or legal) discharging effluent into the environment are required to submit quarterly discharge monitoring records to NEMA.

### **3.2.4 Water Resources Management Rules, 2007**

The project will be required to submit authorization to the Water Resources Authority within 12 months of the commencement of the rules as stated in Part II Section 17 (1). Failure to submit the documents may be used as a basis for revocation, variation or cancellation of the permit or authorization.

Part VII Section 97 of the Rules states that the Authority shall, where applicable, require an applicant to show evidence of compliance with the provisions of EMCA. Section 99 states the need for controlling and measuring devices for accurate measurement of the water abstracted.

The WRA Rules, 2007, Part VIII Section 104, states that the Authority shall be paid for water abstracted by any person in possession of a valid water permit or supposed to have a valid water permit. Section 107 states that the Authority may with good cause or at the request of the landowner demarcate the riparian boundary of any watercourse or body on any land at its own cost. Part IX of the WRA Rules, 2007 gives guidance on conservation of riparian and catchment areas. Riparian area (according to the Rules Part I) is land in respect of which management obligations are imposed on the owner by the authority due to its proximity to a water body. It does not imply change of ownership but imposes management for preservation of quality (and quantity) of the water resource.

### **3.2.5 Kajiado County Water Sector and Sanitation Policy, 2019**

The water sector and sanitation policy seek to guide the County Government of Kajiado on how to develop and implement an effective water services and sewerage system where there is guaranteed clean and safe water for all. It further provides a framework for sustainable and equitable development of water resources through promotion of good governance of affordable supply and sanitation in the county. The policy intends to coordinate stakeholders in the water and sanitation sector, develop and implement a legal framework to aid delivery of water and sewerage services, ensure enhanced delivery of sewerage services and the inclusion of rural population in the delivery of water and sewerage services in the county.

## **3.3 Environmental Policy and Regulatory Framework**

### **3.3.1 National Environment Action Plan Framework**

The National Environmental Action Plan Framework is the second national environmental policy after the 1994 National Environmental Action Plan (NEAP). The development of NEAP is provided for by EMC (amendment) Act 2015 which requires preparation of Environmental Action Plan at different levels; County and national levels. The framework recognizes the intertwined linkages between economic growth and environment in Kenya. It highlights priority themes and activities for the country towards achieving sustainable environment.

### **3.3.2 Environment Management & Coordination Act Cap 387**

This Act of Parliament, EMCA 1999 and the subsequent amendments, is the parent Act of Parliament that provides for the establishment of appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto.

EMCA, in its 13 interrelated parts, provides regulatory provisions for all levels of environmental conservation and management. The first one part provides legislative guidelines on administrative and planning components of environmental management. They include; (I); General principles (II); Administration (III); Environmental planning (IV); Protection and Conservation of the Environment. Parts five to seven focus on on-field management of the environment as an integral component of actual or proposed projects. (V), Environmental impact assessments (EIA), audits and monitoring (VI); Environmental audit and monitoring (VII); Environmental quality standards. The last five parts of the Act regulate on enforcement of provisions outlined in the Act and recognition of international agreements along which the EMC (amendment) Act 2015 has been established. They are; (VIII); Environmental Restoration orders, Environmental Easements (IX); Inspection, analysis and records (IX); Inspection Analysis and Records (X); International Treaties, Conventions and Agreements (XI) National Environment Tribunal (XII); Environmental Offences (XIII).

All the chapters 1 to 13 apply to the proposed project at one stage or the other and therefore the project proponent is required to understand and conform with the Act accordingly. One such area is Environmental and Socio Impact Assessment. This is expressly stated in section 58(2) of the Act.

### **3.3.3 The Environmental (Impact Assessment and Audit) Regulations, 2003/Legal Notice 31 & 32**

This is a supplementary legislation to the EMC (amendment) Act. It gives additional punch by providing guidelines for conducting Environmental Impact Assessments and Audits. It offers guidance on the fundamental aspects on which emphasis must be laid during field study and outlines the nature and structure of Environmental Impact Assessments and Audit reports. The legislation further explains the legal consequences of partial or non-compliance to the provisions of the Act.

The Legal Notice 31 & 32 categorizes the proposed project as a high-risk one that requires a comprehensive study. This implies undertaking a detailed assessment of site conditions, extensive public participation and broad stakeholder engagement.

Dam construction, water supply and sanitation infrastructure development are one of the activities listed on section 8 (e) in the second schedule of Environmental Management and Co-ordination (amendment) Act 2015 as among projects that require an Environmental Impact Assessment before commencement. The project cannot start before the license is granted, upon conducting the ESIA. For this reason, this report provides the legal requirements for the project

approval. Impacts of water supply and sanitation projects, involves major elements of the environment, including land, water and human health and safety.

### **3.3.4 Environmental Management and Coordination (Conservation of Biological Diversity) Regulations 2006**

These regulations are described in Legal Notice No. 160 of the Kenya Gazette Supplement No. 84 of December 2006. These Regulations apply to conservation of biodiversity that includes Conservation of threatened species, inventory and monitoring of biological diversity and protection of environmentally significant areas, access to genetic resources, benefit sharing and offences and penalties. This legislation takes cognizance of the need to promote the integrity of biodiversity to promote their integrity. Most of the biological diversity is highly threatened by development in the current world and there is an apparent need to enhance their integrity. Section IV, prohibits any activity, which may have adverse effects on the ecosystem.

### **3.3.5 Environmental Management and Coordination (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulations 2009**

These regulations provide for the protection, management of wetlands, riverbanks, lakeshores, seashore management, and detail guidelines on the same.

### **3.3.6 Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007**

These Regulations aim to regulate the production, trade and use of controlled substances and products; provide for a system of data collection to facilitate compliance with relevant reporting requirements under the Montreal Protocol on Substances that Deplete the Ozone Layer; promote the use of ozone friendly substances, products, equipment and technology; and ensure the elimination of substances and products that deplete the ozone layer.

### **3.3.7 Environmental Management and Co-ordination (Waste Management) Regulations, 2006**

Regulations guiding waste management are described in Legal Notice No. 121 of the Kenya Gazette Supplement No. 69 of September 2006. They offer legal provisions on handling of a variety of wastes emanating from various projects and activities. The waste categories covered by the regulations include:

- Industrial waste
- Hazardous and toxic wastes
- Pesticides and toxic substances
- Biomedical wastes
- Radio-active substances

These Regulations outline requirements for handling, storing, transporting, and treatment / disposal of all waste categories as provided therein. Part V section 34 requires that pesticides or toxic substances be disposed at designated site or plant approved by the authority.

### **3.3.8 Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations 2006**

These regulations are described in Legal Notice No. 131 of the Kenya Gazette Supplement No. 74 of October 2006 and will apply to all internal combustion engine emission standards, emission inspections, the power of emission inspectors, fuel catalysts, licensing to treat fuel, cost of clearing pollution and partnerships to control fossil fuel emissions.

### **3.3.9 Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Control Regulations, 2009**

This is covered under the legal notice number 61. These Regulations under part II section 3 prohibit making or causing any loud, unreasonable, unnecessary or unusual noise, which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.

Section 4 prohibits excessive vibrations and excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or excessive vibrations which exceed 0.5 centimetres per second beyond any source property boundary or 30 meters from any moving source;

Operations of machineries that produce excessive noise are also prohibited under section 11 including; Operating or repair of any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air-conditioning apparatus or similar mechanical device; or engaging in any commercial or industrial activity, which is likely to emit noise or excessive vibrations that exceed the levels prescribed in the First Schedule (See annex) to these Regulations.

The legal notice also prohibit construction at night except for the purposes specified in sub-Regulation (2) which include roads and other public utilities. Section 15 calls for an Environmental Impact Assessment to be carried out by any person intending to carryout construction, demolition, mining or quarrying work to do an Environmental Impact Assessment studies to identify natural resources, land uses or activities which may be affected by noise or excessive vibrations from the construction, demolition, mining or quarrying;

Determine the measures that are needed in the plans and specifications to minimize or eliminate adverse construction, demolition, mining or quarrying noise or vibration impacts; and incorporate the needed abatement measures in the plans and specifications.



## **4 BASELINE CONDITIONS**

### **4.1 General Overview**

The proposed project is located in Kajiado County. The county is located in the Southern part of the Kenya. The physical aspect of the entire county is critical as the dam and the water supply infrastructure are spread out within the county. The county lies at latitude  $1^{\circ} 0'$  and  $3^{\circ} 0'$  to the South and longitude  $36^{\circ} 5'$  and  $37^{\circ} 5'$  to East. It borders counties of Nairobi to the North East, Narok to the West, Nakuru and Kiambu to the North, Taita Taveta to the South East, Machakos and Makueni to North East and East respectively.

The county is divided into 5 sub-counties namely Kajiado Central, Kajiado West, Kajiado East, and Kajiado South. It is further divided into 25 wards, 101 locations and 212 sub-locations. Major urban centres within the county include Kitengela, Ngong, Ongata Rongai, Kiserian, and Isinya town.

### **4.2 Physical Environment**

#### **4.2.1 Physical features**

A mixture of plains, valleys, and occasional volcanic hills characterizes the Kajiado county. The topography within the county is divided into Rift valley, Athi Kapiti plains, and Central Broken Ground with the lowest point at about 500 m above sea level (asl) at Lake Magadi and the highest point at about 2500 m asl in Ngong Hills.

The Rift Valley stretches from North to South in the Western part of the county characterized with steep walls that form plateaus, scarps, and structural plains forming features like Mt. Suswa and Lake Magadi. The Athi Kapiti plains form critical dispersing grounds for Nairobi National Park (NNP) and is preferred for calving for wildebeest from the Southern parts of Tsavo West, Chyulu and Amboseli National Park. The Central Broken Ground lies at an altitude range from 1220 to 2073 m above sea level and stretching 20-70 kilometres wide from North Eastern border to Southwest across the county.

#### **4.2.2 Hydrology**

The catchment area is for the Proposed Namanga Dam is  $12.5\text{km}^2$  with a stream order of 2 with the catchment taking the shape of a leaf with a stream length of about 6 km from the highest and remotest point to the location of the proposed dam with a high energy stream since it falls from 1895 masl to 1314 masl in a short distance.

The climate of Namanga catchment as having two bimodal rainy seasons the long and short rains of January to April and November to December respectively. During this Study, meteorological data (Rainfall and Temperature) were obtained from the Kenya Meteorological Department (KMD) and Trans-African Hydro-Meteorological Observatory (TAHMO) for the

stations within and in close proximity to the Catchment Area. This remotely sensed data from TAHMO was subsequently used for analysis in computation of catchment runoff.

#### **4.2.2.1 Environmental Flows**

The Water Act 2016 defines the Environmental flow as the quantity and quality of water required:

- To satisfy basic human needs for all people who are or may be supplied from the water resource; and
- To protect aquatic ecosystems in order to secure ecologically sustainable development and use of the water resource.

The design of a dam or reservoir located on a watercourse will need to comply with the requirements of the Reserve as specified in the WRA Rules (2007). The Rules state that the environmental flow shall exceed the Q95 or the flow that is exceeded 95% of the time, as defined by a naturalized flow duration curve. A flow duration analysis was carried on the Simulated Flows (Section 2.4.6 of the hydrology report) at the proposed dam site and Q95 of  $0.05449 \text{ m}^3/\text{s}$  will be released downstream as Environment Flows.

#### **4.2.2.2 Sediment Load Analysis**

Namanga dam can be classified as having a low erosion to moderate erosion rate since most of area is highly forested. The Study estimated that an average sediment yield of  $500 \text{ m}^3/\text{km}^2/\text{yr}$  based on the guidelines of the Design Manual for Small dams in Kenya. This will translate to an annual yield of  $0.0064 \text{ Mm}^3$  and sediment load of  $0.32 \text{ Mm}^3$  over the 50-year service life of the dam (assuming 80% trapping Efficiency). This corresponds to a dead storage level of 1322.0 masl.

#### **4.2.3 Soils**

The soil and rock structure in the county come in three geological regions namely Quaternary volcanic, Pleistocene and Basement rock soils. River valleys and parts of the plains are dominated with basement rock system, which consist mainly gneisses, cists, quartzite and crystalline limestone. The inland lake drainage system is especially around Lake Amboseli is largely underlain with Pleistocene soils and quaternary volcanic soils are found mainly in the Rift Valley region. Soil type is one aspect alongside altitude and rainfall in determining vegetation type in the area. Soils are well drained; shallow to moderately deep, brown to dark brown, firm and slightly smeary, strongly calcareous, stony to gravelly clay loam, in many places' saline and/or sodic soils and with inclusions of lava fields (Ando-calcaric Regosols, partly lithic phase).

The dam site area has Red brown sandy soils, indicative of underlying Basement System rocks. Some sections are covered by black cotton soils. Parts of the river valley at the dam is deeply gullied by seasonal streams running from the hillsides. Pebbles of varying sizes, originating usually from pegmatites or quartzites in the Basement System and occasionally from the Kapiti phonolite, are found in the sandy riverbeds.



*Plate 4-1: Sandy River Bed at the dam site*

### **4.3 Biological Environment**

#### **4.3.1 Flora and Fauna**

Kajiado County has a total of 16, 866.88 Ha of gazetted forest that consists of both indigenous and exotic forests. The county has three main forests namely Entarara forest in Kajiado South, Ngong Forest in Kajiado North, and Ol Doinyo Orok Forest in Kajiado Central and two forest under trust land namely Embakasi and Ololua. The Ol Doinyo Orok Forest where the proposed project will be developed covers an area of nearly 12 000 hectares and lies on the slopes of Ol doinyo Orok, a hill straddling the Kenya-Tanzania border. It is gazetted as protected forest reserve. The forest is home to a variety of animal and plant species that are not found in the semi-arid lowlands. The animal species in this forest include wild dog, elephant, gerenuk, lesser kudu, porcupine and a prolific birdlife. The forest supports the livelihoods of the communities living in the area through products such as fuelwood, pasture, wild foods and medicinal plants. It is managed by the Kenya Forest Service in collaboration with the community through the Ol doinyo Orok Community Forest Association.







*Plate 4-2: Trees within the Ol Doinyo Orok Forest (Proposed dam site)*

#### **4.3.2 Climatic Conditions**

Namanga lies in the semi-arid lands of Kenya categorized as Agro Ecological Zone V. The distribution of the rainfall is bimodal received in two rain seasons. The short rain season is between November and December and the long rain season between January and April. The mean monthly maximum rainfall in the two seasons range between 110- 160 mm largely influenced by the altitude among other factors, which is mostly, depressed. The driest month is July in which monthly average precipitation is approximately 1 mm with highest precipitation in April, averaging 160 mm. The mean maximum and minimum temperatures for the catchment are 29.6 °C and 15°C respectively. Temperature variability tend to correspond to the variability in rainfall. Temperatures are high during the rainy seasons and low during the dry period.

#### **4.4 Socio-economic environment**

##### **4.4.1 Demographic characteristics**

According to the 2019 Kenya Population and Housing Census, Kajiado County has a total population of 1,117 840 where males are 557,098 and females are 560,704. During the Census, the project area was under Kajiado Central Sub-County. However, in 2020, the Government of Kenya created a new Sub County, Oloililai Sub County to serve the residents of Ng’ataack, Maili Tisa, Torosei, and Namanga Towns. This implies that the project area now lies in Oloililai Sub-County.

The table below shows the population distribution in each location and sub-location within the project area and depending on which project component.

Table 4-1: Demographic characteristics within the project area

Project Component	Location	Sub-Location	Male	Female	Total
Dam/ Water Treatment Plant	Ol Doinyo Orok	Ol Doinyo Orok	2127	2101	4228
		Eng'aboli	1921	1941	3862
Water Supply System	Namanga	Namanga	7917	7669	15586
Water Supply System	Il Bissil	Il Bissil	3834	3978	7812

#### 4.4.2 Land Ownership

In the county, land ownership is classified into three namely communal, private, and public land. Most of the land is registered either as leasehold or freehold interest. An estimated 95 percent and 5 percent of land in rural and urban areas is registered and titled respectively. The mean land holding size in the county stands at nine (9) Ha in small scale and 70 Ha on large scale.

#### 4.4.3 Land use

The county is dominated with livestock farming by the *Maasai* community practicing pastoralism. Small to medium scale farming is practiced in high potentials areas of Ngong, Loitokitok, and Nkuruman while large-scale flower farming is practiced in Kitengela and Isinya areas. The county is experiencing rapid urban development that include industrial and housing developments which is spread across the county with increased sub-division and fragmentation of agricultural land affecting rural livelihood sustainability.

#### 4.4.4 Education

The project area has around 12 learning institutions where ten are primary schools and three are secondary schools. One rescue centre is located along the Namanga-Nairobi Highway. Out of this, the percentage of boys who have enrolled in the school is higher than that of the girls. The transition from primary to secondary schools is also high among the boys than the girls. This is attributed to issues such as early marriages and Female Genital Mutilation. With only one rescue centre in the area, the challenges are being addressed, but not quite significantly as traditional practices are keenly observed in the area.

#### 4.4.5 Infrastructure

##### 4.4.5.1 Health

There are 4 sub county hospitals namely Kajiado, Loitokitok, Ngong and Kitengela, 17 health centres and 78 dispensaries under by the county government. There are also 6 hospitals, 13



nursing homes, 7 health centres, 27 dispensaries and 101 clinics, which are either managed by private, faith based, community based and other non-government organizations. The county has 92-community health units initiated out of which only 78 are active. The doctor population ratio is 1:26,094, Public Health Staff is 1: 7,619, and the nurse population ratio is 1: 1,068. The average distance to a health facility is 14.3 Km against the 5 Km recommended by WHO with only 9.9 percent of the population within a distance of less than a Kilometre to a health facility.

#### **4.4.5.2 Transport System**

The county is linked up to various centres within and around the county through five (5) major roads, Standard Gauge Railway (SGR) and 7 airstrips. The five major tarmac roads are Emali-Loitokitok, Namanga-Kitengela, Isinya-Kiserian, Magadi-Mbagathi and Kiserian-Ngong. The SGR passes through the parts of Kajiado East and North with a terminus at Emali that facilitates transportation of soda ash and offering commuter services in the area. At least each sub-county in the county is served with an airstrip in Kajiado town, Loitokitok, Olooloitikosh, Ngong, Magadi, Daraja and Amboseli National Park.

#### **4.4.5.3 Energy Access**

Kajiado County is regarded as the frontier counties in developing green energy with Ngong hills wind power contributing the national power grid with a capacity of 25.5 MW. Green energy such as wind, biogas, and solar are envisioned to be of great potential in the county. Electricity, solar, lantern and tin lamp are the major sources of lighting in the county. An estimated 39.8 percent of households use electricity, 39.8 and 18.9 percent of households use tin lamp and lantern respectively. About 94.6 and 74.5 percent use paraffin, firewood and charcoal in rural and urban areas respectively. Liquefied Petroleum Gas (LPG) and electricity is common for cooking in urban areas with an estimated 21.4 and 2.0 percent of households respectively.

#### **4.4.5.4 Economic Activities**

The labour force in the county is projected at 624, 184 with agriculture, manufacturing, construction, and transport sectors being the major employers. An estimated 40 percent of the population is self-employed in Micro, Small and Medium Enterprises while the public sector is reported to employ 0.7 percent of the total population. On the other hand, unemployment rate in the county stand at 9.7 percent slightly lower than the national rate at 11 percent. In addition, a large population engage in livestock trade, retail and wholesale trade, horticultural and floriculture, industrial activities, Jua kali, and tourism sector – tour guide and sale of cultural artefacts and beads.

#### **4.4.5.5 Water Supply**

Kajiado County is characterized with an acute shortage of clean water and safe for drinking and to serve other domestic purposes. The county lacks a reliable source of water with the main



sources of water being seasonal rivers, shallow wells, springs, dams, water pans and boreholes. The most reliable source of water is from boreholes and rural communities depend on water pans, dams, and protected springs. The county is supplied with the following rivers of Nolturesh, Magoine, Rombo, Kajiado, Namanga, Mbagathi, Kandisi, and Athi River among others.

An estimated 67.2 percent of the total population have access to safe water with about 36.8 percent of the households have access to piped and portable water. There are five registered Water Resource User Associations (WRUAs) that help in the management of water resources in the county. However, in the project area, the WRUA has been quite dormant. Besides, there multiple water companies in the county. The proposed project area is under the jurisdiction of Ol Doinyo Orok Water and Sewerage Company (OLWASCO) and the Olkejuado Water and Sanitation Company (OWASCO).

#### **4.4.5.6 Sanitation**

Sanitation distribution in rural areas is low at 26 percent and 47 percent in urban areas accessing toilets/latrines. The county lacks a sewerage connection system and residents rely on ineffective methods of waste management such as urine diverting toilets and septic tanks. There is no sewer treatment plant in the county and therefore pit empties/exhaust vehicles have to transport the waste to Ruai waste treatment plant in Nairobi. The situation is expected to worsen with the rapid urbanization that will increase effluent discharge. The county has seven dumpsites in Kajiado, Kitengela, Bissil, Ngong, Loitokitok, Mashuuru and Isinya. There are 8 trucks that aid waste management in the county alongside several private investors that collect garbage from homesteads at a fee.

## 5 PUBLIC CONSULTATION AND STAKEHOLDER ENGAGEMENT

### 5.1 Introduction

Stakeholder engagement is a critical process in a project as it significantly influences the project's success. Stakeholders in this report refers to person (s) who has an interest or can either affect or be affected by the project. It is important to undertake effective consultation with stakeholders from the project inception to closure.

In this project, stakeholders were mapped out as either primary or secondary. They were then analysed based on their impact, level of influence, importance to the project, and contribution to the project. This helped in determining the best strategy for engaging with them. It then concludes with a summary of the feedback obtained from the stakeholders that is reviewed and incorporated in the final design, construction and operation of the project.

### 5.2 Objectives of Stakeholder Engagement

Stakeholder engagement has the following objectives:

- **Inform:** Provide accurate, relevant, timely and culturally appropriate information to Project stakeholders about the Project, its impacts and benefits, and the ESIA process.
- **Engage:** Provide opportunities for Project stakeholders to express their opinions and concerns about the Project, and to seek broad stakeholder support for the Project and impact management
- **Understand:** Enable the Project team to understand the concerns and priorities of stakeholders
- **Review:** Incorporate justified concerns and priorities into the design, construction and operation of the Project
- **Inform (feedback):** Provide feedback to Project stakeholders and host communities as the Project develops so that the consultation process continues.

### 5.3 Stakeholder Mapping

Mapping of stakeholders is an essential process that assists the expert in understanding whom they need to prioritize in their engagement. The following stakeholders have been identified as persons who will be affected by the project or who could influence the project's success. They are mapped as either:

- Primary Stakeholders-** Those who hold a direct interest in the proposed project
- Secondary Stakeholders-** Those with an indirect interest, but they can influence the project's success.

They are mapped as shown in the table below:

Table 5-1: Mapping of Stakeholders

Primary Stakeholders	Secondary Stakeholders
<ul style="list-style-type: none"> <li>• Project Affected Persons</li> <li>• Hosting community at the Proposed Dam area (Enkokidong'oi Village-Maili Tisa Town) and at the Waste Water Treatment Plant (specific location to be determined)</li> <li>• Kenya Forest Services</li> <li>• Kenya Wildlife Services</li> <li>• Neighbours along the project area</li> <li>• Ol Doinyo Orok Water &amp; Sewerage Company (OLWASCO) &amp; Olkejuado Water &amp; Sanitation Company (OWASCO)</li> <li>• Client (Implementing Agency) - Tanathi Water Works Development Agency Client (TAWWDA)</li> </ul>	<ul style="list-style-type: none"> <li>• County Government of Kajiado</li> <li>• CECM (Water, Irrigation, Environment &amp; Natural Resources)</li> <li>• CECM (Lands, Physical Planning &amp; Urban Development)</li> </ul>
	<ul style="list-style-type: none"> <li>• National Land Commission (NLC)</li> <li>• National Environment Management Authority (NEMA)</li> <li>• Water Resource Authority (WRA)</li> <li>• Water Resources Users (WRUA)</li> <li>• NGOs / CBOs</li> <li>• Institutions within the area (Schools, Hospitals, Churches etc.)</li> </ul>
	<p>Political class</p> <ul style="list-style-type: none"> <li>• Member of Parliament</li> <li>• MCA</li> <li>• Ward Administrator</li> </ul>
	<p>Local Administration</p> <ul style="list-style-type: none"> <li>• County Commissioner –Kajiado County</li> <li>• Deputy County Commissioner –Oloililai Sub County</li> <li>• Assistant County Commissioners- Oloililai Sub County</li> <li>• Chiefs and their Assistants</li> </ul>



## 5.4 Stakeholder Analysis

Table 5-2: Analysis of project stakeholders

Stakeholder Name	Impact (Low, Medium, High)	Influence (Low, Medium, High)	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project?	Strategy for engaging the stakeholder
<b>TAWWDA</b>	High	High	Improve the existing water system and meet the water demands in line with Vision 2030	By providing funds for undertaking the project	Blocking the funds	Regular status report, monthly reports and other deliverables
<b>OLWASCO</b>	High	Low	Obtaining water to supply to the public	Communicate with other stakeholders to express their support for the project	Making complaints about quality of service after the reports	Information and feedback meetings every 6 months
<b>OWASCO</b>	High	Low	Obtaining Water to supply to the public	Communicate with other stakeholders to express their support for the project	Printing stories that oppose the new reforms	Quarterly progress meetings
<b>Enkokidong'oi Village (dam site &amp; WTP))</b>	High	High	Understanding how the project safeguards their	By sharing their concerns, opinions about the project	Reject the project by refusing to be displaced	Create project awareness and provide an open communication



Stakeholder Name	Impact (Low, Medium, High)	Influence (Low, Medium, High)	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project?	Strategy for engaging the stakeholder
			safety as the host community, in case of displacement, how resettlement will be undertaken.	from the design stage.		to ensure they understand the project well. Their engagement shall be ongoing throughout the project cycle
<b>Ormankeki Village (Proposed WWTP)</b>	High	High	Understanding how the project safeguards their safety and health as the host community, in case of displacement, how resettlement will be undertaken.	By sharing their concerns, opinions about the project from the design stage.	Reject the project by refusing to be displaced	Create project awareness and provide an open communication to ensure they understand the project well. Their engagement shall be ongoing throughout the project cycle
<b>County Government of Kajiado- Department of Water</b>	High	Low	Ensuring consistent water supply and sanitation needs in the county are met.	By sharing relevant information on proposed project with the Client/Consultant.	_____	Through KII and Focused Group Discussions. Consultant sharing their findings with the County.



Stakeholder Name	Impact (Low, Medium, High)	Influence (Low, Medium, High)	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project?	Strategy for engaging the stakeholder
				Assist in the creation of project awareness and promoting acceptance		
<b>KFS</b>	High	High	Ensuring the forest is not destroyed.	By sharing any relevant information pertaining the forest	If the project is found to be destructive and no mitigation measures are provided, the stakeholder can block the project.	Sharing the findings with the stakeholder during each step of the project.
<b>KWS</b>	High	High	Ensuring the wild animals remain safe	By sharing any relevant information pertaining the wild animals in the forest	If the proposed project is likely to cause any harm to the animals and endanger their livelihood	Sharing the findings with the stakeholder during each step of the project.
<b>NLC</b>	High	Low	Ensuring they acquire the land	Inform the affected stakeholders of the	—	The client to officially communicate to the





Stakeholder Name	Impact (Low, Medium, High)	Influence (Low, Medium, High)	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project?	Strategy for engaging the stakeholder
			needed for the project implementation on behalf of the Government	acquisition process during the disclosure stage		County Coordinator and Director of Valuation when the acquisition process needs to be initiated
<b>NEMA</b>	High	High	Adequate Environmental and Social Impact Assessment is undertaken before the project construction	By availing the ESIA report for review and licensing	By not issuing EIA License	Providing ESIA Report and all other necessary documentation regarding the project for review
<b>WRA &amp; WRUA</b>	High	High	Proper management and use of water resources	By sharing relevant information of the water resources that will be affected by the project. Link the consultant with the WRUA of the project area	By not issuing WRA permits required for water abstraction	Consulting with the stakeholder during the design stage and providing the relevant reports needed for issuing of permits.



<b>Stakeholder Name</b>	<b>Impact</b> (Low, Medium, High)	<b>Influence</b> (Low, Medium, High)	<b>What is important to the stakeholder?</b>	<b>How could the stakeholder contribute to the project?</b>	<b>How could the stakeholder block the project?</b>	<b>Strategy for engaging the stakeholder</b>
<b>Politicians (MCA, Ward Administrators, MP etc.)</b>	Low	High	The residents within their area of jurisdiction access and enjoy amenities like water and proper sanitation	Creating awareness about the project in order to obtain support and project acceptance		Involving them in focused group discussions and public stakeholder meetings
<b>Local Administration (CC, DCC, ACC, Chiefs &amp; Assistant Chiefs)</b>	Low	High	Law and order are adhered to during the project implementation phases	Help in organization of local meetings, sharing relevant information about the project area, assist in identifying the affected land owners,  Help in resolution of any complaints that may arise during the project implementation phase.		Involving them in KII, focused group discussions and public stakeholder meetings.  Communicating all findings during each step of the project.  Head the Grievance Redress committee once they are set up



## 5.5 Stakeholder Engagement Approach

Stakeholder engagement process is a crucial process in the undertaking of any project. The interaction is aimed at creating awareness, obtaining their views/opinions and concerns about the project.

Table 5-3: Methodology adopted in Stakeholder Engagement

Technique	Target Group	Objective	Date Undertaken
Key Stakeholder Interviews	Secondary Stakeholders <ul style="list-style-type: none"> <li>County Government of Kajiado-CEC Water, Environment, Natural Resources</li> <li>KFS</li> <li>NEMA</li> <li>KWS</li> <li>WRA</li> <li>Local Administration (DCC-Ngatataek Sub County, ACC, Chiefs &amp; Assistant Chiefs)</li> </ul>	<ul style="list-style-type: none"> <li>To create awareness about the project</li> <li>To obtain their views regarding the project</li> </ul>	3/11/2021-5/11/2021
Public Entry Meeting	<ul style="list-style-type: none"> <li>Residents within the project area</li> </ul>	<ul style="list-style-type: none"> <li>To create awareness about the project</li> <li>To inform them about the upcoming field work activities to be undertaken by the Consultant</li> </ul>	17/11/2021 & 19/11/2021
Household Surveys	<ul style="list-style-type: none"> <li>Residents within the project area</li> </ul>	<ul style="list-style-type: none"> <li>To understand the socio-economic status of the affected communities</li> </ul>	12/9/2022-17/9/2022
Focused Group Discussion	Key stakeholders	<ul style="list-style-type: none"> <li>To obtain their input on the proposed design</li> </ul>	16/09/2022
Asset inventory	Project Affected Persons	<ul style="list-style-type: none"> <li>To take an inventory of all assets that will be displaced by the project for purposes of budgeting</li> </ul>	3/04/2023-10/04/2023
Public Consultation Meeting	<ul style="list-style-type: none"> <li>Residents within the project area</li> </ul>	To obtain their views/opinions/concerns about the developed design	8/12/2022 & 5/04/2023

## 5.6 Summary of Feedback from the Secondary Stakeholders

The Consultant undertook Key Informant Interviews that targeted the Secondary Stakeholders from 3/11/2021 to 5/11/2021. The feedback from the stakeholders is summarized below:

### a) County Government of Kajiado- Department of Water

- Dam safety for both the local residents and the wild animals should be considered during the design and construction phases of the project
- The locals should be given first priority in job opportunities particularly for the casual labourers
- Consider putting up troughs and communal water points for livestock and community respectively
- There is need for the Water Service Providers and TAWWDA to ensure proper sensitization to the local community on the billing of water service
- The county should be involved in public meetings during the design phase and site meetings during the construction and supervision stage.
- The County would like to have an officer/staff as part of the Project Implementation Unit
- A Disaster Management Office that collaborates with the County Office should be established

**b) County Government of Kajiado- Department of Environment**

- Urged the Consultant to conduct public participation in all the stages of the project
- Consider solar energy in areas where pumping is needed as its more sustainable
- Sand harvesting is a major source of livelihood and income for the County Government. Since it's an activity practised within the project area access how the project will affect the activity.
- Consultant to check on the land tenure of the proposed location for the construction of the Wastewater Treatment Plant (WWTP) because an area zoned as residential is prohibited from setting up of a WWTP.

**c) Local Administration**

- Ensure the local authority is alerted whenever any activity is ongoing to ensure security especially of equipment
- Create awareness on compensation and land acquisition process to avoid conflicts
- Consider alternative sources of energy such as solar to ensure consistent water supply in the area
- Build trough points for livestock to access water
- Ensure the dam is fenced to avoid cases of drowning
- During construction, the contractors should work with the local authority
- Casual work should be accorded to the local workers

**d) Ol Doinyo Orok Water and Sewerage Company Ltd (OLWASCO)-MD**

- Ensure adequate awareness and sensitization meetings about the project are held
- Engage all relevant stakeholders to promote project ownership and support

- Train the host community on the need and how to protect the project equipment from vandalism and destruction by animals
- e) **Olkejuado Water and Sanitation Company Ltd (OWASCO)- MD**
  - Ensure proper sensitization to the local community on the billing of water service is done
  - Boreholes are highly an unreliable source of water in the area; the dam will really help in boosting the situation.
- f) **National Land Commission –County Coordinator**
  - The client to officially communicate to the County Coordinator and Director of Valuation when the acquisition process needs to be initiated.
- g) **Kenya Forest Service-Namanga Forest Station Manager**
  - All reports on the Consultant's findings to be availed to the KFS offices
  - During the studies, KFS will be availing rangers to accompany the experts to the forest since there are wild animals.
  - An active Community Forest Association is in existence and they are involved in conserving the forest.

## 5.7 Summary of Feedback from the Public

The Consultant undertook Public Entry Meetings to create awareness about the project from 17/11/2021 to 19/11/2021. The Client TAWWDA, representatives from OLWASCO, Area MCA and the Local Administration (ACC, Chiefs and Assistant Chiefs) were present in the meetings. The Consultant provided a brief of the project Scope, upcoming field activities then had a question and answer forum with the attendees. The team first met with the Opinion Leaders before conducting the public meetings. They are all supportive of the project as lack of water is a critical issue in the area. However, they had concerns that are summarised below. The minutes of the meetings are attached in the Appendix.

### 5.7.1 Feedback from Public

- *Employment opportunities*- The locals should be given first priority in the available job opportunities especially during construction. The locals should be hired as interns to ensure skills and knowledge are transferred.
- *Land Acquisition*- Forceful eviction should not be done. The affected persons should first be compensated using market rates. There should be no delays as in the past projects the affected persons failed to get their compensation.
- *Scope of Water Supply Areas*- Areas that may not be reached with the water connections to the residential areas, consider putting up water kiosks at common points to boost accessibility. Local community tend to clash over the resource particularly during the dry season.



- *Dam Safety* is a critical concern particularly among the residents leaving downstream of the proposed dam. Sensitive receptors such as Noontoto Primary School and First Baptist Church are also located downstream
- There are several *existing community water projects* that are likely to be affected by the proposed project. The consultant needs to ensure that the local community projects are well handled especially during construction phase. The community recommended that the pipelines should be relocated before construction commences.
- *Billing of Water*-The Community would not wish to be charged for the water provided for domestic use-The Consultant explained that billing was necessary as the funds are used for maintenance of the project and ensuring people access clean water. Besides, if no billing is done, the project may not be sustainable. The billing rates are set by WASREB.
- *Change in Title Deed to indicate an existing wayleave*, will it imply that the wayleave is no longer your land? Others were of the opinion that the wayleave should be left as public land- The Consultant explained that the wayleave will still be part of your land only that there are limited activities the owner can do on that section. For instance, no permanent structure should be constructed or planting of trees.
- *Impact of Sewerage Plant causing diseases like Cholera and issue of smell*- The WWTP is constructed in such a way that trees are planted to assist with the smell and is not located near a residential place. The raw sewer water will not mix with the clean water as they have separate pipelines. However, in case of spillage, OLWASCO has to be having routine checks and have a communication system where the public can alert them and repair immediately.
- *Rehabilitation of existing water projects in the area*- Yes, the existing water facilities will be rehabilitated.
- *Setting up a Health Facility*-Namanga has no public health facility. Residents have to travel to Bissil or access private clinics. As part of CSR activities consider establishing a health facility as cases of Malaria and other water associated diseases are likely to be on the rise once the project is implemented.



*Plate 5-1: Courtesy Call by the TAWWDA & RCG team at County Commissioner's Office in Kajiado*



*Plate 5-2: Courtesy Call at ACC's Office-Oloitililai Sub County with TAWWDA, RCG, OLVASCO team*





*Plate 5-3: Courtesy Call at CECM-Water Kajiado County with the client-TAWWDA and RCG team*



*Plate 5-4: Opinion Leaders Meeting at Namanga*







Plate 5-5: Opinion Leaders at Maili Tisa



Plate 5-6: Public Meeting at Namanga Town



Plate 5-7: Public Meeting at Maili Tisa



## **6 ANALYSIS OF ALTERNATIVES**

### **6.1 Introduction**

The Proposed Namanga Dam Water Supply and Sanitation Project is set to be implemented in Oloililai Sub County in Kajiado County. The location of the Proposed Dam is about 6km from Maili Tisa Market centre. The water from the dam is set to be supplied in Namanga and Bisil towns, and all other areas in between the two towns. The design of the water supply system targets mainly a gravity flow, but where it is inevitable, pumping using solar energy will be incorporated to ensure a large population benefits from the project. This chapter analyses the different alternatives considered in selection of the dam site and type and water supply transmission.

### **6.2 The No Project Alternative**

The no-action alternative is often defined by the baseline information and is crucial in the assessment of impact because other alternatives are weighed with reference to it. This alternative would mean that the project does not proceed.

The no project alternative option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from the conservative environmental perspective as it ensures non-interference with the existing conditions. Under no project alternative, the proponent's proposal would not receive the necessary approval from NEMA and proposed project would not be constructed. This option will however, involve several losses both to the community and the county as a whole. Development of the project on the other hand will improve water provision to the residents of Namanga.

The no project option will however lead to the following (general) major negative and long-term impacts:

- OLWASCO and OWASCO would remain without regular water supply to provide to its consumers. The existing water sources that are not functional will also not be rehabilitated.
- High operation costs due to electricity bills as result of pumping
- Vandalism of the steel elevated tanks and general low storage capacity of the existing systems
- Water shortage degrading their quality of health and sanitation
- Stunted economic growth within the urban areas as a result of water shortage and high cost of water
- Poor economic stimulation as a result of unemployment
- Skills of the locals will remain underutilized
- Increased time wastage as a result of travelling long distances to fetch water
- Increased risk of water related conflicts
- The proponent will not increase distribution in the service area



This scenario is not appropriate on either social or environmental grounds.

### 6.3 Location Option

#### 6.3.1 Dam

##### 6.3.1.1 Dam Site Selection

The most suitable site selection for the dam took into consideration the following six factors;

- (i). **Topographical parameters:** site characteristics considerations include minimum dam fill volume, optimal water storage / reservoir volume, suitability of the site for spillway location, simplicity of diversion system arrangement during construction, closeness gravity flow to treatment works and supply area, etc.
- (ii). **Geological and geotechnical parameters:** This considers dam, appurtenant structures and other water conveyance structures foundations geological formation, reservoir water tightness, fault and lineament observations, etc. Availability of natural construction materials, for prioritizing dam type,
- (iii). **Hydrological parameters:** This considers the water source potential and minimum sediment inflow
- (iv). **Water supply parameters:** This considers possibility of transmission of the water from reservoir to the Namanga town and its environs with minimum cost (by gravity).
- (v). **Social and environmental parameters:** This consider minimum inundation of village and farm area (if any) and willingness of the people to relocate for the project upon compensation, etc.,
- (vi). **Accessibility:** The site with the most convenient access road during construction, investigations and in service generally given priority.

After preliminary consideration of the above factors, most suitable site for Namanga dam has been selected as site 1 as shown in figure 6-1 below. The selected site deemed more suitable in terms of financial costs and technical aspects. Upon review of the Topographical data available for Site 2, it was noted that downstream of the proposed dam axis is more problematic due to social impact and higher pumping head requirements. Upstream of this site is challenged by inadequate reservoir storage area

- The recommended dam site is suitable for any embankment and gravity type of dams.
- The river valley at the dam site is wide (about 700m). For an embankment dam type spillway can be out of the dam body.
- However, it is noted that the selected dam site will not serve the entire supply area by gravity.

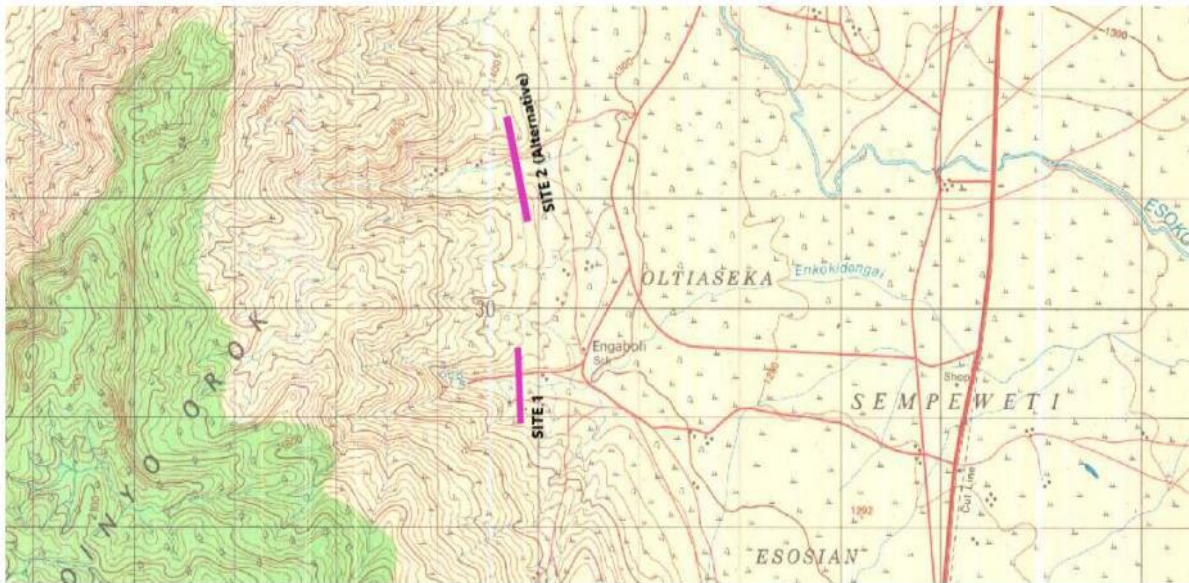


Figure 6-1: Selected Dam Axis alignment (Site 1) and possible alternative site (Site 2)

#### 6.3.1.2 Dam Type Selection

Namanga dam is being constructed to impound water during periods of surplus supply for use during periods of deficient supply, mainly for water supply purpose. Generally, dam types selections are based on the purpose of the dam, for what purpose it will be built and based on general characteristics of the candidate /selected dam site, those are: topography, geology and foundation, dam construction materials availability, hydrology, climate, earthquake activity, etc. Potential options for spillway, necessary power/ water supply outlets, the options for river diversion during construction, availability of labour and equipment, accessibility of the site and dam safety issues. These all affect the final choice of the dam type. Based on previous studies and site investigations, two types of dams have been considered:

##### a) Embankment Dam

- (i). **Earth-fill Dam:** These are constructed of selected soils ( $0.001 \leq d \leq 100 \text{ mm}$ ) compacted uniformly and intensively in relatively thin layers ( $20 \text{ to } 60 \pm \text{ cm}$ ) and at controlled optimum moisture content. Compacted natural soils form more than 50% of the fill Material. Dams may be designed as: Homogeneous, Zoned or with impermeable core. Zoned part is made of relatively finer material that reduces seepage flow, e.g. clay. The fill material is placed as rolled, hydraulic fill or semi-hydraulic fill.
- (ii). **Rock-fill Dam:** Over 50% of fill material be of class 'rock' usually a graded rock-fill ( $0.1 \leq d \leq 1000 \text{ mm}$ ) is filled in bulk or compacted in thin layers by heavy plant. Some impervious membranes/materials are placed in the interior or on u/s face of the embankment to stop/reduce seepage through the dam embankment. Dams section may be homogeneous, zoned, with impermeable core, or with asphalt or cement concrete face. Zoned part is made of relatively finer material that reduces seepage flow, e.g. clay. Core is made of clay, concrete, asphalt concrete etc.
- (iii). **Earth-fill-rock-fill or Earth-rock dams:** These dams are made of mix of large proportions of earth-fill and rock-fill materials.



### **Merits**

- Suitable to type of sites in wide valleys and relatively steep sided gorges alike.
- Adoptable to a broad range of foundation conditions-from competent rock to soft and compressible or relatively pervious soil foundation.
- Use of natural materials at smaller cost thus no need to import or transport large quantities of processed materials or cement to the site.
- Subject to the design criteria, embankment dams are extremely flexible to accommodate different fill materials (rock, earth) if suitably zoned internally.
- Construction process highly mechanized and continuous (less human handling as form work, curing time)
- If properly designed, dam can safely accommodate appreciable degree of settlement-deformation without risk of serious cracking and possible failure. Embankment dams withstand earthquake better. However, the foundation of these dams, if deep and of unconsolidated origin is more liable to settlement and failure by earthquake (liquefaction).

### **Demerits**

- Inherent greater susceptibility to damage or destruction due to over topping (require adequate flood relief and separate spillway).
- Vulnerable to concealed leakage and internal piping/erosion in dam or foundation.

#### **b) Concrete Dam**

Concrete dams are formed of cement-concrete placed in the dam body. Concrete dam section designed such that the loading produces compression stress only and no tension is induced anywhere. The reinforcement is minimum mainly as temperature control. Concrete is placed in two ways: Reinforced Concrete dam (RC dam) or Roller compacted concrete (RCC) dams. The variations of concrete dam include:

- Gravity dam:** Stability due to its mass. Dam straight or slightly curved u/s in plan (no arch action). The u/s face is vertical or nearly vertical, d/s sloping.
- Buttress dam:** It consists of continuous u/s face supported at regular intervals by d/s buttress (massive buttress /diamond head, round head) with each section separate. Ambursen / flat slab buttress / decked buttress
- Arch dam:** Arch dam has considerable u/s plan curvature. U/s and d/s faces are nearly straight / vertical. Water loads are transferred onto the abutments or valley sides by arch action. Arch dam is structurally more efficient than concrete gravity dams (requires only 10-20% concrete). However, abutment strength and geologic stability is critical to the structural integrity and safety of the dam. Multiple arch dams.
- Cupola/Dome/Double curvature dam:** U/s & d/s faces curved in plan and profile section, curved in plan as well/ as arch (Part of a dome or shell structure).
- Hollow gravity:** The section made hollow to reduce uplift pressure at d/s side and smaller total construction materials. (Between gravity and buttress dams)

### **Merits**

- Concrete dams, except arch and cupola, are suitable to site topography of wide or narrow valley alike, provided that a competent rock foundation is present at moderate depths ( $< 5$  m) (arch best for narrow section)
- Concrete dams are not sensitive to overtopping under extreme flood conditions.
- All concrete dams can accommodate a crest spillway, if necessary, over the entire length, provided that steps are taken to control d/s erosion and possible undermining of the dam. Thus cost of separate spillway is avoided.
- Outlet pipe works, valves and ancillary works are readily and safely housed in chambers or galleries within the dam.
- Has high inherent ability to withstand seismic disturbances.
- Cupola dam is extremely strong and efficient structure for a narrow valley with competent abutments.

### **Demerits**

- Concrete dams require sound and stable rock foundations. These require processed natural materials of suitable quality and quantity for aggregate and importation to site and storage of bulk cement and other materials.
- Traditional mass concrete construction is slow, labour intensive and discontinuous, and requires adequate skill for formwork, concreting etc.
- Cost per unit of concrete dam much higher than embankment fill. Smaller quantities seldom counter balance for dams of given height.

### **Adopted Dam Type**

Based on the above analysis and other parameters such as topography, geotechnical and geological structure of the dam site, availability of construction material, spillway size and location, river diversion, a Rock-fill dam with an impervious central core, is recommended.

#### **6.3.2 Water Supply System**

A water treatment works that uses a full conventional treatment has been proposed for construction near the dam. Once the raw water is treated, it will be transmitted to consumers within the project area using different pipe route options.

##### **6.3.2.1 Transmission Pipe Route Options**

Two approaches for pumping water have been analysed.

- Pumping to high point at Ngatataek then serving Namanga Town and Ngatataek from this point. Then boosting from this location at Ngatataek to Bisil Town.*
- Serving low areas of Namanga Town from the WTP, then locating a booster pump along the pipeline to boost and supply the high points at Namanga Town. Also pumping to both Bisil and Ngatataek from the WTP using separate pumping lines.*

Taking option 2, the water is transmitted through gravity while supply along the way for a distance of 8.4km after which the remaining head is lifted at a head of 100m to get to Dubai tank. For option 1, the water to Namanga is first pumped to a high point in Ngatataek which is located 10km away from the WTP, the pumping head for the entire Namanga town flow will

be 130m. However, if only the volume that was being pumped to Namanga (in option 2) is lifted to Ngatataek, then the head would be 115m.

From the above discussion, taking water to Ngatataek would be uneconomical in terms of operations considering the total heads as indicated above. It will also be expensive in terms of capital cost since the length of pipe will be more by 20km if the total volume was pumped to Ngatataek and more by 28.4 if only part of the volume is pumped to Ngatataek and the remaining volume gravitated for the 8.4 km as previously stated.

Based on the above analysis, option 2 is adopted. The transmission line to Bisil is designed to deliver 4836 m<sup>3</sup>/day, while the transmission line to Ngatataek is designed to deliver 2202 m<sup>3</sup>/day and the transmission line to Namanga designed to deliver 3507 m<sup>3</sup>/day.

#### **6.3.2.2 Selected Pipe Material**

Plain ended cement mortar lined steel pipes, manufactured to BS 534 and joined using couplings, are proposed for construction of the raw water main and transmission line to Bisil. External protection against corrosion is to be provided by the factory-applied epoxy coating. HDPE pipe is proposed for the transmission pipe to Ngatataek and Namanga town



## **7 IMPACT IDENTIFICATION, ANALYSIS**

### **7.1 Potential Impacts and Mitigation Measures**

It is envisaged that the proposed project will generate both positive and significant negative impacts during its life. The proposed dam will generate most of the critical environmental impacts. In the assessment, the assessors will suggest measures to mitigate against the negative impacts, while enhancing the positive one. They are not exhaustive and the proponents and the eventual occupants should continuously monitor the effectiveness of the mitigation or prevention measures recommended in the report.

#### **7.1.1 Construction Phase**

##### **(i). Interference with the physical setting**

The proposed project could result into the following negative impacts:

- a) Changes in the local topography during site grading, construction of dam, treatment systems and laying of pipes among others
- b) Blockage of natural drainage system at valley crossings

##### **Mitigation measures**

- The design shall in no way propose to implement developments that will hinder drainage, change the topography or introduce physical changes that are not in harmony with the physical setting of the Project area;
- The structures to be developed should be aesthetically acceptable to blend in with the surrounding.
- The proponent shall as much as possible complete the works in such a way that natural aesthetics shall be retained at the locations;
- Restoration shall be undertaken to ensure that the original setting is as much as possible retained.

##### **(ii). Displacement and loss of Land**

This may be occasioned by the nature of the project particularly where the water supply pipes are being laid.

##### **Mitigation measures**

- Ensure the affected PAPs are adequately compensated based on the market rates;
- In case there are realignments during the implementation of the project and private parcels of land are affected, valuation should be undertaken and the affected persons are compensated accordingly.

##### **(iii). Noise Pollution**

Construction of the proposed Project will most likely result in noise emissions as a result of the machines that will be used e.g. excavation equipment and construction vehicles delivering materials to site. Noise will also be generated from the construction workers. Significance of noise impacts depends on whether the Project would increase noise levels above the existing

ambient levels by introducing new sources of noise. Noise impacts would be considered significant if the Project would result in the following:

- a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- b) Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels;
- c) A substantial permanent increase in ambient noise levels (more than 3 dBA) in the project vicinity above levels existing before the project; and
- d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing before the project.

**Mitigation measures**

- Install portable barriers to shield compressors and other small stationary equipment where necessary;
- Use of quiet equipment (i.e. equipment designed with noise control elements);
- Limit pickup trucks and other small equipment to a minimum idling time and observe a common sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible;
- Provision of appropriate personnel protective equipment;
- Construct mainly during the day;
- Maintain noise levels during daytime of maximum 55 dBA in residential and educational areas and 70 dBA in industrial/commercial areas
- Observe blasting protocols e.g., use of barricades, notifications etc.

**(iv). Site Safety, Security, and Welfare arrangements**

The nature of the project brings into fore many safety, security and health issues. These range from accidents or incidents from works, attack by wild animals and vandals, poor hygiene etc.

**Mitigation measures**

- The project participants shall guarantee security of all the personnel working in the project;
- Barriers shall be erected to prevent unauthorized access to the project sites
- Security personnel shall be deployed to secure the safety of the workers and property against vandals;
- The Contractor shall have his workers appropriately trained on safety and health matters;
- Any accident, incident or hazardous situation should be reported immediately it occurs or identified;
- The Contractor shall ensure that any food served at the sites meets the minimum hygienic conditions;
- The contractor shall provide insurance cover for any eventuality during work to the employees;

- The proponent/contractor shall provide adequate and suitable sanitary facilities for workers during construction period;
- The Contractor shall deploy as EHS officer at the project 'site' to foresee implementation of the EHS and security matter; and
- The Contractor shall abide by the all the relevant provisions of OSHA, 2007 and other relevant legislations

**(v). Dam Safety**

With poor designs and plans, dams have been known to be catastrophic. During excavation accidents may lead to injury or even death.

**Mitigation measures**

- The contractor shall ensure safe operating procedures (SoPs) and Safe Systems of Work (SSW) are elaborate and communicated to all workers and those who may be exposed to hazardous situation during works
- The contractor shall employ a full time Environment, Safety and Health Supervisor to foresee implementation of the EHS policy
- The Contractor shall provide, free of charge, all employees with personal protective gear
- Due diligence shall be an integral part in any undertaking or component during dam construction
- Dam shall a no-go zone to unauthorised persons
- The supervision team shall ensure that works are carried out as per the specifications contained in the final design

**(vi). Worker's welfare (hygiene and sanitation)**

Welfare of the workers is crucial for a successful project. Both legal and moral standards require that workers are provided with adequate facilities that will guarantee safety and health. The Act (OSHA, 2007) obligates the employer to provide essentials facilities for sanitation water, accommodation for clothing, portable water supply, first aid facilities etc. Conversely, moral standards require that 'duty of care' be upheld in working situations to prevent injurious conditions.

**Mitigation measures**

- The Contactor shall abide by the requirements under OSHA, 2007 in regard to the safety, health and welfare of the workers
- The contractors shall provide, free of charge, appropriate PPEs
- The Contractor shall provide clean portable drinking water for the workers
- The Contactor shall provide first-aid services
- sanitation facilities for both sex;

- The Contractor shall communicate and implement the contents of the EHS policy of the Company to the employees
- The Contractor shall make available emergency services at the site/ camp;
- The Contractor shall retain a well trained and experienced EHS officer at the site
- The Contractor shall have trained staff on OSH, as per the DOSHS curriculum at the site

**(vii). Potential human-wildlife conflicts**

There is a risk of attacks by wildlife on the project workers and disruption of works. This is particularly the case in the dam construction area.

**Mitigation measures**

- An elaborate plan for the construction works on the wildlife corridors
- Construction in the human-wildlife conflict hotspots should take place only at day time

**(viii). Effects on flora (plants/vegetation)**

OI Doinyo Orok Forest where some of the works will be undertaken is home to a variety of plant species including indigenous trees and shrubs. It is also a wildlife habitat. The construction works may lead to destruction of vegetation and interference with the wildlife breeding zones and corridors. The project may also lead to devegetation along the reticulation lines where pipes will be laid.

**Mitigation measures**

- The Contractor and other project participants must ensure minimal or no disturbance to natural vegetation;
- Where necessary, a compensatory conservation regime shall be established to allow for revegetation. This can be done within the farmlands within the 'project site' or within the forest (upstream of the project area) in collaboration with KFS
- The project shall document, quantitatively, the number of trees or volume of vegetation lost due to the project both at the dam site and along the conveyances
- The project will allow for selective cutting down of trees where possible to ensure conservation of mature indigenous trees
- The project will make provision for tree planting within the site restoration activity

**(ix). Water Quality**

Construction works within or adjacent to watercourses have the potential for reducing water quality through increased sediment load. Fuel leakages from storage tanks or vehicles and inappropriate disposal of wastes can cause pollution incidents. Such material can also be leached to the groundwater.

**Mitigation measures**

- Adopt proper site management and pollution prevention measures.
- Locate storage areas and compounds away from watercourses
- Appropriate storage of fuel and materials
- Providing suitable facilities for workers
- Disposing of waste according to a waste management plan.

#### **(x). Project Related Conflicts**

There may be issues that may arise during project construction that need attention. This may range from employment issues, division of supply, project activities within the area etc.

##### **Mitigation measures**

- The project shall have in place a conflict/issues management strategy
- All matters or issues that may arise during construction shall be documented and presented to the relevant persons
- All matters or issues that may arise shall be resolved amicably
- Sensitive matters beyond control of the relevant persons or institutions shall be referred to the court of law.
- The Contractor shall ensure that locals are given first priority during recruitment of workers
- In specialized tasks, the Contractor shall ensure that apprentices are from the local community to allow for skills transfers
- Any misunderstanding shall be communicated and amicably solved/addressed

#### **(xi). HIV/AIDs and STIs and Alcohol or Substance Abuse**

The scourge still stands a national disaster. Workers, especially during end months are prone to indulgence in unprotected sex and alcohol.

##### **Mitigation measures**

- The Contractor shall ensure that free condoms are provided at the construction camp-site
- During evaluation of the EHS policy of the Contractor, HIV/AIDs policy element shall be expressly provided and written
- The policy shall be sufficiently communicated to the workers
- The Contractor shall identify the nearest health centre where affected employees can access medication (anti-retroviral)
- Posters, notices and other forms of awareness creation shall be used to sensitize workers on HIV/AIDs

- Education and sensitization
- Alcohol and substance abuse shall be totally discouraged

**(xii). Politics and political good will**

Intense and negative political influence is a recipe to collapse of many projects. Indulgence in political insinuations may lead to postpone or delay to project completion and implementation.

**Mitigation measures**

- The project participants shall desist from any form of political inclinations
- The community shall be sensitized on negative political influence on projects implementation
- The politicians shall be encouraged to desist from negative politics for the sake of the community economic development

**7.1.2 Operational Phase**

**(i). Dam Safety**

The structural stability of the dam and prevention of accidents by both human and wildlife is critical during dam life. Otherwise, lack of proper maintenance and security of the dam may lead to catastrophic episodes.

**Mitigation measures**

- The dam shall be constructed as the approved designs and adhere to any conditions attached to their approval
- Regular maintenance of the dam shall be conducted and mitigation measures recorded
- A buffer zone (green zone) shall be established to prevent unauthorized entry into the dam area.
- The dam site shall be designed to prevent slip and fall by wild animals- fencing off the site shall be considered
- Security shall be provided at the dam area to prevent accidents (deliberate or accidental drowning)

**(ii). Dam sedimentation/siltation**

Dependent on surface runoff, water reservoirs are prone to siltation and sedimentation if it's not well protected against soils and other debris being deposited in the dam. This may render the dam mal-functional during operation and increase on O&M operations costs

**Mitigation measures**

The design shall allow for de-siltation or self-cleaning mechanism for the dam

- Operation and Maintenance



- Lack or inadequate O& M procedures and actions may affect the integrity of the dam works which both direct and indirect implications on the environment.
- An elaborate O&M strategy shall be drawn to address any shortfalls that may take and
- Regular monitoring, reporting and feedback on any O&M issue/s
- Spills and Spillway Management

**(iii). Vandalism of installed infrastructure**

Water and sanitation utilities often experience theft from residents especially when the system is not functional/no water flow. These activities can affect the delivery and management of the installed system, which results to poor sanitation and reduced efforts in supplying water in a given catchment. They ranging from destroying the ablution blocks, theft of pipes, fittings, and water through bypassing meters and tempering with connections.

**Mitigation measures**

- The implementing agency to ensure good relationship with the local community through participation in water conservation and hygiene programmes
- Establish and understand the motives behind vandalism
- Foster household ownership of the infrastructure through household contributions in the installation of supply connections.
- Enforce law against reported cases of vandalism

**(iv). Water quality**

The project seeks to supply water for domestic use and hence the potential risk of water contamination during the reticulation. This may lead to waterborne illnesses and other health complications.

**Mitigation Measures**

- Ensure the proposed water treatment plant is constructed in accordance with the existing standards
- Provide for periodic water quality monitoring at strategic points including the WTP and along the distribution lines
- Secure dam area to prevent accidental or deliberate water contamination

**(v). Water Conservation**

Increased water provision may lead to wastage of the scarce resource among beneficiaries. The system could also present inefficiencies that lead to water loss in the course of distribution

**Mitigation Measures**

- The piping material should be resistance to abrasions from external elements to prevent leakages

- Establish a monitoring system to allow for prompt detection of leakages and repairs
- Create awareness among project beneficiaries on the need to use water judiciously.
- Build the capacity of the water utility to continuously improve the efficiency of the water supply system including reduction of non-accounted water, installation of efficient technologies e.g. automated water points in water kiosks

#### (vi). Energy Use

The proposed project will utilize power in the reticulation and treatment process. This may be unsustainable if the system is not efficient. Additionally, the project could provide an opportunity for infusion of clean energy to mitigate against the environmental and social impacts of unclean sources such as diesel

### **Mitigation Measures**

- Optimize the use of gravity in conveying the water from the dam to the households
- Integrate clean sources of energy in the water supply system e.g. in water treatment plant

#### **7.1.3 Decommissioning Phase**

The project shall bear detrimental impacts if necessary measures are put in place to prevent environmental hazards and risks resultant of the abandonment. This may include the dam safety and security issues, the conveyances and the changes to the concerned community.

### **Mitigation measures**

- The Proponent shall subject the project to an abandonment environmental and social impact assessment or risk management in the event of closure of the project.
- The process shall involve all the concerned parties
- The legislations and best environmental practices prevailing then shall apply.

#### **7.2 Impact Analysis**

Table 7-1: Analysis of identified impacts to determine if mitigation is required or not

Possible Impacts	Type of Impact	Mitigation Required	Mitigation Not required
Construction Site			
Community mobilization & conflicts	Significant/Localized/Social		
Employment	Significant/Localized/Social		
Air quality	Significant/ Localized/Social		
Landscape changes	Significant/Localized/Social		
Displacement & land acquisition	Significant/Localized/Economic		



Possible Impacts	Type of Impact	Mitigation Required	Mitigation Not required
Water quality	Moderately significant/ecological		
Consideration of dam safety	Very significant/Technical/regional impacts		
Worker's safety & welfare	Significant/Localized/social		
Human-wildlife conflicts	Significant/Localized/ecological		
De-vegetation	Very Significant Localized/ecological		
Noise & vibrations	Significant /Localized/Physical		
Legal considerations			
Moral decadence	Significant Localized/Social		
Operation Phase			
Increased water supply	Very Significant/localized/cumulative/social		
Improved sanitation	Very Significant/localized/cumulative/social		
Dam sedimentation	Very Significant/Localized		
Operation and maintenance	Very Significant/Localized		
Dam safety	Very Significant/Localized		
Safety considerations at WTP	Very Significant/Localized		
Water management	Significant/Localized		
Increased generation of waste water	Significant/Localized		
Vandalism of utilities	Very Significant/localized/social		
Water Quality	Very Significant/localized/social		
Water Conservation	Significant/Localized		
Energy Use	Significant/ Localized		
Decommissioning Phase			
Occupational health and safety issues	Very Significant/localized/social		



## **8 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

### **8.1 Introduction**

Several impacts have been identified that are likely to affect the project both positively and negatively. They have also been identified based on three different project phases: construction, operation and decommissioning phase. A plan illustrating how the identified impacts will be managed throughout the project cycle has been formulated in Table 8-1 below. However, it is important to note that before the construction commences, the contractor will be required to develop an updated Environmental and Social Management Plan that will be implemented during the construction phase of the project.

Table 8-1: Draft ESMP during the Construction, operational, and decommissioning phases of the project

Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
<b>Construction Phase</b>						
Interference with physical settings	Changes in the local topography during site grading, construction of dam, treatment systems and laying of pipes among others	•The design shall in no way propose to implement developments that will hinder drainage, change the topography or introduce physical changes that are not in harmony with the physical setting of the Project area;	Contractor	Restoration of degraded sites	Minimal landscape changes	150,000
		•The structures to be developed should be aesthetically acceptable to blend in with the surrounding.	TAWWDA			
		•The proponent shall as much as possible complete the works in such a way that natural aesthetics shall be retained at the locations;				

Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
		•Restoration shall be undertaken to ensure that the original setting is as much as possible retained.				
Displacement and loss of land	Displacement of loss of land occasioned by infrastructures such as WTP, supply lines	•Ensure the affected PAPs are adequately compensated based on the market rates;	Contractor	RAP developed  Compensation grievances	Satisfactory compensation	120,000*  Not inclusive of the compensation
		•Valuation should be undertaken and the affected persons are compensated accordingly	TAWWDA			
Noise Pollution	Generated from construction activities, material transportation trucks	•Install portable barriers to shield compressors and other small stationary equipment where necessary;	Contractor	Noise pollution is within acceptable limits	Minimal noise pollution	250,000





Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
		<ul style="list-style-type: none"> <li>•Use of quiet equipment (i.e. equipment designed with noise control elements);</li> <li>•Construct mainly during the day;</li> </ul>	TAWWDA			
		<ul style="list-style-type: none"> <li>•Maintain noise levels during daytime of maximum 55 dBA in residential and educational areas and 70 dBA in industrial/commercial areas</li> <li>•Observe blasting protocols e.g., use of barricades, notifications etc.</li> </ul>				
Consideration of Dam Safety	With poor designs and plans dams have been known to be catastrophic. During exaction accidents	•The contractor shall ensure safe operating procedures (SoPs) and Safe Systems of Work (SSW) are elaborate and	Contractor	Project Safety plan, Documented and available SSW and SoPs	Safe and secure working environment at the sites	100,000



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
	may lead to injury or even death.	communicated to all workers and those who may be exposed to hazardous situation during works				
		<ul style="list-style-type: none"> <li>•The contractor shall employ a full time Environment, Safety and Health Supervisor to foresee implementation of the EHS policy</li> <li>•The Contractor shall provide, free of charge, all employees with personal protective equipment</li> </ul>	TAWWDA			
Site Safety, Security, and Health arrangements	The nature of the project brings into fore many safety, security and health issues. These range from accidents or incidents from	<ul style="list-style-type: none"> <li>• The contractor shall provide a detailed safety, security and health plan for the project;</li> <li>•The project participants shall guarantee security</li> </ul>	Contractor  TAWWDA	Drafting meetings and Approved SSHP	Safety and secure sites	500,000



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
	works, attack by wild animals and vandals, poor hygiene and sanitation etc.	<p>of all the personnel working in the project;</p> <ul style="list-style-type: none"> <li>•Barriers shall be erected to prevent unauthorized access to the project sites</li> <li>•Security personnel shall be deployed to secure the safety of the workers and property against vandals;</li> <li>•The Contactor shall have his workers appropriately trained on safety and health matters</li> </ul>				



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
		<ul style="list-style-type: none"> <li>Any accident, incident or hazardous situation should be reported immediately it occurs or identified;</li> </ul> <p>Due diligence shall be an integral part in any undertaking or component during dam construction</p> <p>Dam shall be a no-go zone to unauthorized persons</p>				



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
Worker's welfare (hygiene and sanitation)	Welfare of the workers is crucial for a successful project. Both legal and moral standards require that workers are provided with adequate facilities that will guarantee safety and health. The ACT (OSHA, 2007) obligates the employer to provide essentials facilities for sanitation water, accommodation for clothing, portable water supply, first aid facilities etc. Conversely, moral standards require that 'duty of care' be upheld in working	<ul style="list-style-type: none"> <li>•The Contactor shall abide by the requirements under OSHA, 2007 in regard to the safety, health and welfare of the workers</li> <li>•The contractors shall provide, free of charge, appropriate PPEs</li> <li>•The Contractor shall provide clean portable drinking water for the workers</li> <li>• The Contactor shall provide first-aid services</li> <li>•sanitation facilities for both sex;</li> <li>•The Contractor shall communicate and implement the contents of the EHS policy of the Company to the employees</li> </ul>	The Contractor,	Visual site inspections, audits and training records	Safe and health working environment	200,000





Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
	situations to prevent injurious conditions.	<ul style="list-style-type: none"> <li>•The Contractor shall make available emergency services at the site/ camp;</li> <li>•The Contractor shall retain a well trained and experienced EHS officer at the site</li> <li>•The Contactor shall retain trained staff on Occupational safety and health as per the DOSHS curriculum, at the site</li> </ul>		Freq: Continuous		
Disruption of water supply systems/conveyances by wildlife especially elephants	Elephants have peculiar/special sense of water; in case of drought or water shortage, elephants can be able to trace the line and make all efforts to reach the resource.	<ul style="list-style-type: none"> <li>•The project designers (engineers) shall ensure that the pipe is well protected against any intrusion by elephants</li> </ul>	The Contractor, the Project, KWS	Physical sites visits, the designs perusal and reports by employees Freq: Weekly		200,000



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
	These may disrupt the works.					
Effects to protected flora (plants/vegetation) & de-vegetation	A variety of indigenous trees and shrubs are found within the project	•The Contractor and other project participants must ensure minimal or no disturbance to natural vegetation	The Contractor	site visits reports	Restoration activities implemented	500,000



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
along the water supply lines	area especially Ol Doinyo Orok Forest	<ul style="list-style-type: none"> <li>• Where necessary, a compensatory conservation regime shall be established to allow for vegetation. This can be done within the farmlands within the 'project site' or within the forest</li> <li>• The project shall document, quantitatively, the number of trees or volume of vegetation lost due the project both at the dam site and along the conveyances</li> </ul>	TAWWDA KFS	Freq: continuous		



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
Water Quality	Contamination of water sources during construction	<ul style="list-style-type: none"> <li>• Adopt proper site management and pollution prevention measures.</li> <li>• Locate storage areas and compounds away from watercourses</li> <li>• Appropriate storage of fuel and materials</li> <li>• Providing suitable facilities for workers</li> <li>• Disposing of waste according to a waste management plan.</li> </ul> Vegetation	The Contractor TAWWDA Department of water-Kajiado County	Water quality assessment reports	Zero contamination	800,000
HIV/AIDs and STIs and Alcohol or Substance Abuse	The scourge still stands a national disaster. Workers, especially during end months are prone to indulgence in unprotected sex and	<ul style="list-style-type: none"> <li>• The Contractor shall ensure that free condoms are provided at the construction camp-site</li> <li>• During evaluation of the EHS policy of the Contractor, HIV/AIDs</li> </ul>	The Contractor,	Visual surveys, records, materials	Low or zero HIV/Aids prevalence and sober and productive workforce	50,000



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
	alcohol. This may be exacerbated by project's proximity to Kajiado and Nairobi town's.	<p>policy element shall be expressly provided and written</p> <ul style="list-style-type: none"> <li>•The policy shall be sufficiently communicated to the workers</li> </ul>		Freq: Daily		
		<ul style="list-style-type: none"> <li>•The Contractor shall identify the nearest health center where affected employees can access medication ( anti-retroviral)</li> <li>•Posters, notices and other forms of awareness creation shall be used to sensitize workers on HIV/AIDS</li> <li>•Education and sensitization</li> <li>•Alcohol and substance abuse shall be totally discouraged</li> </ul>				





Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
<b>Operational Phase</b>						
Dam Safety (human and wildlife) and the community	The structural stability of the dam and prevention of accidents by both human and wildlife is critical during dam life. Otherwise, lack of proper maintenance and security of the dam may lead to catastrophic episodes	<ul style="list-style-type: none"> <li>The dam shall be constructed as the approved designs and adhere to any conditions attached to their approval</li> </ul>	The Contractor,	Accident or incident records	Zero Accident or incident	800,000
		<ul style="list-style-type: none"> <li>Regular maintenance of the dam shall be</li> </ul>	OLWASCO, NEMA, DOSHS, The County			



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
		<p>conducted and mitigation measures recorded</p> <ul style="list-style-type: none"> <li>•A buffer zone (green zone) shall be established to prevent unauthorized entry into the dam area.</li> <li>•The dam site shall be designed to prevent slip and fall by wild animals-fencing off the site shall be considered</li> <li>•Security shall be provided at the dam area to prevent accidents (deliberate or accidental drowning)</li> </ul>	Government, KFS	Freq: Continuous		



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
Dam sedimentation/ Siltation	Dependent on surface runoff, water reservoirs are prone to siltation and sedimentation if it's not well protected against soils and other debris being deposited in the dam. This may render the dam mal-functional during operation and increase on O&M operations costs	<ul style="list-style-type: none"> <li>•The design shall allow for de-siltation or self-cleaning mechanism for the dam</li> <li>•The dam may not be able to hold the ultimate project capacities hence affecting the proposed project</li> <li>•The integrity of the dam may be impacted due to increased loads</li> <li>•Excess spillage may lead to localized flooding with high impact on the recipient environments</li> </ul>	NEMA, KFS, OLWASCO, NEMA, DOSHS,	Records for de-sedimentation or de-siltation Regular Visual inspections and records and feedback Freq: continuous	Sediments or siltation free-dam	500,000 p.a
		<ul style="list-style-type: none"> <li>• Planting shrubs and trees along the periphery</li> </ul>				



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
		<ul style="list-style-type: none"> <li>• Connection of untreated/substandard industrial wastewater to the sewer line must be strictly prohibited.</li> </ul>	NEMA			
Vandalism of infrastructure	Vandalism of infrastructure for sale, vandalism due to conflicts	<ul style="list-style-type: none"> <li>•The implementing agency to ensure good relationship with the local community through participation in water conservation and hygiene programs</li> <li>•Establish and understand the motives behind vandalism</li> <li>•Foster household ownership of the infrastructure through household contributions in the installation of supply connections.</li> </ul>	OLWASCO & OWASCO	Zero cases reported	Infrastructure is secured	200,000p.a



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
Water Quality	Water contamination during reticulation	<p>Ensure the proposed water treatment plant is constructed in accordance with the existing standards</p> <p>Provide for periodic water quality monitoring at strategic points including the WTP and along the distribution lines</p> <p>Secure dam area to prevent accidental or deliberate water contamination</p>	OLWASCO & OWASCO	Periodic water quality monitoring	Water quality is within recommended level	300,000 p.a
Water Conservation	Water losses due to wastage, leakage etc.	The piping material should be resistance to abrasions from external	OLWASCO & OWASCO	Records on water loss/usage	Reduced water loss	100,000 p. a





Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
		<p>elements to prevent leakages</p> <p>Establish a monitoring system to allow for prompt detection of leakages and repairs</p> <p>Create awareness among project beneficiaries on the need to use water judiciously.</p> <p>Build the capacity of the water utility to continuously improve the efficiency of the water supply system including reduction of non-accounted water, installation of efficient technologies</p>				



Impact domain	Impact description	Mitigation/s Remedial Action/s	Implementation agency/ies	Monitoring Indicators and Freq. (F)	Mitigation target	Mitigation Cost/s (KShs)
<b>Decommissioning Phase</b>						
End of project strategy	The project shall bear detrimental impacts if necessary measures are put in place to prevent environmental hazards and risks resultant of the abandonment. This may include the dam safety and security issues, the conveyances and the changes to the concerned community	<ul style="list-style-type: none"> <li>•The Project shall subject the project to an abandonment environmental and social impact assessment or risk management in the event of closure of the project.</li> <li>•The process shall involve all the concerned parties</li> <li>•The legislations and best environmental practices prevailing then shall apply.</li> </ul>	OLWASCO & OWASCO	Decommission strategy/Plan Freq: End of Project	Environmental protection	TBD



## **9 CONCLUSION AND RECOMMENDATION**

### **9.1. Conclusions**

The primary objective of the proposed project is to enhance access to water supply in Namanga, Kajiado County. The hydrological analysis established that the amount of water available in Namanga river is adequate for capture in a dam and the same is of acceptable quality for domestic use. Environmental flows have been provided for to ensure that the proposed dam does not impair the ecological functions of the river downstream. The geotechnical assessment established that the rock structure and soil in the area can support the proposed dam and the reticulation infrastructure. The baseline survey indicated that water supply is a priority need to the community and that the project will improve the quality of life in the area. A rock fill dam with a capacity of 6,000Mm<sup>3</sup> has been proposed on the basis of the available water, economic feasibility and the estimated water demand in the targeted area. The water from the dam will be treated in a water treatment plant which will be located near the dam and then reticulated to the identified villages. The dam will be located in Ol Doinyo Orok Forest.

The positive impacts that will accrue as a result of the implementation of this project will include: availability of reliable and safe water for domestic use, improved sanitation, reduced waterborne diseases and improved local economic development. However, the project may spur negative impacts during construction which are related to occupational safety, devegetation especially within the forest where the dam will be located and project related conflicts. During operation, the dam may pose a safety risk, it may affect the microclimate, and water contamination concerns. The report has established that these impacts can be mitigated through a combination of strategies including: site restoration and tree planting, erecting perimeter wall along the dam, monitoring of water quality, monitoring water loss, sensitization of water users on conservation measures and building the capacity of the utility to monitor and continuously improve the water supply system.

### **9.2 Recommendations**

The recommendation of this study is that the proposed project be allowed to proceed on strict condition that the environmental management plan is implemented and follow-up is made to ensure compliance as may be directed by NEMA. Recommendations for the prevention and mitigation of adverse impacts are as follows:

- i. Environmental and Social Management Plan should be communicated to all the responsible actors
- ii. The proponent should establish an environmental and social unit to oversee the implementation of the Environmental and Social Management Plan
- iii. The proponent should institute a periodic monitoring plan to ensure regular reporting on environmental and social indicators
- iv. The proponent should document all environmental and social incidences occurring during project construction and operation

## **10 REFERENCES**

Emerton L (1996) Maasai Livelihoods, Forest Use Values and Conservation in Oldonyo Orok, Kenya.

GOK (2018) Kajiado County Integrated Development Plan 2018-2022

KNBS, (2019). 2019 Kenya Population and Housing Census: Volume II: Distribution of Population by Administrative Units.

Runji Consulting Group (2023) Detail Design Report for Detailed Design of Namanga Dam Water Supply and Sanitation Project

## **11 APPENDIX**

### **11.1 Lead Expert License**

Application Reference No:.....164.....  
Registration No:.....0401.....

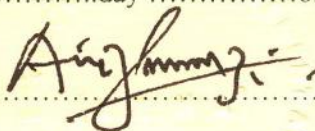
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THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT  
CERTIFICATE OF REGISTRATION AS AN ENVIRONMENTAL IMPACT  
ASSESSMENT/AUDIT EXPERT

This is to certify Ms.....MR. SAMMY C. LETEMA.....  
of.....P.O. BOX 43844-00200, NAIROBI.....(Address)  
has been registered as an Environmental Impact Assessment Expert in accordance with the provisions  
of the Environment Management and Coordination Act and is authorized to practice in the capacity of  
a Lead Expert/Associate Expert/Firm of Experts (Type).....LEAD EXPERT.....

Dated this ...15<sup>TH</sup>.....day ...NOV.....of 20..06....

Signature.....

(Seal)

Director General  
The National Environmental Management Authority





**nema**

mazingira yetu | uhai wetu | wajibu wetu

FORM 7

(r.15(2))

**NATIONAL ENVIRONMENT MANAGEMENT  
AUTHORITY(NEMA)  
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

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

License No : NEMA/EIA/ERPL/19606

Application Reference No: NEMA/EIA/EL/25512

**M/S SAMMY LETEMA**  
(individual or firm) of address  
P.O. Box 43844 - 00100 NAIROBI

is licensed to practice in the  
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**  
**General**

registration number **0401**

in accordance with the provision of the Environmental Management and Coordination  
Act Cap 387.

Issued Date: 5/17/2023

Expiry Date: 12/31/2023

Signature.....

(Seal)

**Director General**

**The National Environment Management Authority**

P.T.O.



ISO 9001:2015 Certified



**nema**  
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Invoice Number: [EPL\\_25512](#)

Invoice Status: [PAID](#)

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Applicant Details:

PIN: [A004651127J](#)

Name: [SAMMY LETEMA](#)

Phone:

Email: [sletema@yahoo.com](mailto:sletema@yahoo.com)

Service	Description	Amount (KES)
Expert License	Payment for Expert License	5,000
Convenience Fee	Ecitizen Convenience Fee	50.00
Total Amount Paid		5,050
Balance		0

Payment Mode  **eCitizen**

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## **11.2 TOR Approval**





# NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Mobile Lines: 0724-253 398, 0723-363 010, 0735-013 046  
Telkom Wireless: 020-2101370, 020-2183718  
Incident Lines: 0786-101100, 0741-101100

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Website: [www.nema.go.ke](http://www.nema.go.ke)

**NEMA/TOR/5/2/392**

**9<sup>TH</sup> February, 2022**

**Chief Executive officer**

Tanathi Water Works Development Agency  
K.I.D.P Building, Along Kalawa Road  
Private Bag-90200

**KITUI**

**RE: ACKNOWLEDGEMENT AND APPROVAL OF TERMS OF REFERENCE  
(TOR) FOR ENVIROMENTAL IMPACT ASSESSMENT**

---

We acknowledge the receipt of TOR for the above subject.

Pursuant to the Environmental Management and Coordination Act, 1999 the second schedule and the Environmental (Impact Assessment and Audit) Regulations 31 and 35, your terms of reference for the Environmental Impact Assessment (EIA) for the proposed **Design of Namanga Dam Water supply and sanitation project** has been approved.

You shall submit ten (10) copies, a soft copy summarised version of the ESMP in **WORD** form and one electronic copy of your report prepared by a registered expert to the Authority.

**MARRIAN KIOKO**  
**HEAD EIA SECTION**

### **11.3 Attendance List and Minutes of Meetings**



## **TANATHI WATER WORKS DEVELOPMENT AGENCY**

### **CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECT**

CONTRACT NO. TAWWDA/028/2020-2021



## **Resettlement Action Plan (RAP) Report**

**May 2023**

**Runji Consulting Group**   
Engineering & Project Management  
P.O Box 68053-00200  
Nairobi, Kenya



## INTERNAL QUALITY CONTROL

Revision	Purpose description	Originated	Checked	Reviewed	Authorized	Date
Rev 1.0	Issue to Client	SL AKM	MR	MMM DMO	RN	25/08/2022
Rev 1.1	Incorporation of valuation report	AKM NK	MR	JOM	RN	22/05/2023



## **ABBREVIATIONS**

ACC	Assistant County Commissioner
TAWWDA	Tanathi Water Works Development Agency
CSOs	Civil Society Organizations
DCC	Deputy County Commissioner
DPs	Displaced Persons
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESAP	Environmental and Social Assessment Procedures
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FI	Financial Intermediaries
GO	Grievance Officer
IVSC	International Valuation Standards Committee
KFS	Kenya Forest Services
M & E	Monitoring & Evaluation
MIC-TAF	Middle-Income Country Technical Assistance Fund
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
PAP	Project Affected Persons
RAP	Resettlement Action Plan
RIU	RAP Implementation Unit
WaSSIP	Water Supply and Sanitation Service Improvement Project
WRUA	Water Resources Users Association
WSS	Water Sanitation Services
WTP	Water Treatment Plant
OLWASCO	Ol Doinyo Orok Water & Sewerage Company Ltd
OWASCO	Olkejuado Water & Sewerage Company
PAPs	Project Affected Persons

## EXECUTIVE SUMMARY

### ES1: Introduction

This RAP Report is prepared as per the Terms of Reference (ToR) for the *Consultancy Services for Detailed Design of Namanga Dam Water Supply and Sanitation Project*. The RAP has been established in order to ensure that any economic or physical displacement resulting from the Project, whether permanent or temporary is undertaken in a socially responsible manner and according to good international practice. Relevant national legislation and financier policies are applied in the Project.

### ES2: Project Resettlement Impact Screening

The screening of Project resettlement impacts was undertaken with the aim of determining the nature, scope and extent of Projects activities to people's property; as the observations are summarized below;

- Loss of land
- Loss of trees (Ol Doinyo Orok Forest)

### ES3: Methodology and Approach

The methodology and approach employed by the consultant are aimed at ensuring effective participation by the public that comprises of both the affected and the hosting community. The approaches employed are both qualitative and quantitative techniques.

- a) Qualitative techniques include: Literature Review and Key Informant Interviews using open ended questionnaires
- b) Quantitative Techniques employed is a structured questionnaire for Socio-economic survey and census survey for asset inventory of the affected property by the Valuer.

### ES4: Socio economic baseline condition

A socio-economic survey targeting the affected persons was undertaken 12<sup>th</sup> September 2022 to 17<sup>th</sup> September 2022. Data was collected among 209 respondents in Namanga, Maili Tisa, Ngatataek and Bisil town centres. It also included respondents from Ormankeki Village (Sewer area) and Enkokidong'oi Village (Dam area). The data was analysed using Statistical Packages for Social Scientist (SPSS) Software.

**Sex Distribution:** The males predominate the project area, but the females were well represented in the exercise.

**Age Distribution:** Majority of the population are aged between 18-47years with the highest age group being those between 28-47years.

**Income:** Most of the respondents earned below KSHS 10,000 monthly salary with a majority of them being self-employed.

**Education Level:** The highest level of education for most respondents is Secondary School, but 23.4% also reported to have no formal education.

**Sources of Water:** The main sources of water for the residents include boreholes, water kiosk/vendors and piped water into households that was deemed highly unreliable during the dry season.



**Human Waste Disposal:** 79.9% of the respondents rely on Pit latrines for disposal of human waste.

**Land Ownership:** Most of the land within the project area lies under the freehold tenure system. However, very few land owners possess title deeds as proof of ownership. Within the town centres, majority of the land owners possess allotment letters as proof of ownership.

## ES5: Institutional and Legal Framework

The Draft RAP has been prepared in compliance with the requirements of the relevant national legislation of the Republic of Kenya. The assessment acknowledged that portions of private land will be acquired either as easement or permanently for construction of the Project. The process of land acquisition will be as provided by Land Act 2012, Land Registration Act 2012, National Land Commission Act 2012 as well as the African Development Bank Operation Safeguard (OS 2) on Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation

Articles 40 of the 2010 Constitution of the Republic of Kenya establish the fundamental principles of right to and protection of private property. In addition to the overarching principles stated in the Constitution, key legislation applicable to land management and expropriation in Kenya includes:

- (a) The Constitution of Kenya
- (b) Land Act 2012
- (c) Land Registration Act 2012
- (d) Valuation Act
- (e) National Land Commission Act
- (f) AfDB OS 2 on Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation

## ES6: Summary of Project Impact

As per the Detailed Design Report, the size of land needed for the entire project implementation is 186.15 acres. Table 0-1 below shows the exact affected size of land in acres and Ha for each component and the total cost of compensation inclusive of the 15% disturbance allowance.

Table 0-1: Estimates of Affected Land Parcel for the various project components

Project Component	Affected Land size in Acres	Affected Land size in Ha	Total Compensation Cost (Inclusive of Disturbance Allowance (KES)
Dam area	64.2451	25.9996	73,881,888
Tank 1,3,4	0.997	0.4035	1,819,341
Pump station 1 & 2	3.5533	1.4380	8,494,996
WWTP	104.3822	42.2429	240,079,160
Access Road	3.053	1.2355	5,266,467
Trunk Line	9.9235	4.0160	36,069,902
<b>Total</b>	<b>186.1541</b>	<b>75.3355</b>	<b>365,611,755</b>



Table 0-2: Summary of total valuation costs

	ASSETS CATEGORY	MARKET VALUE (KSHS)	ADD 15% DISTURBANCE ALLOWANCE (KSHS)	TOTAL VALUE (KSHS)
1	Land (186.15 Acres)	317,923,265.00	47,688,490.00	365,611,755.00
2	10% Contingency Sum			36,561,175.52
	<b>GRAND TOTAL</b>			<b>402,172,931.00</b>

## ES7: Stakeholder Engagement

The consultant held public meetings with the Project Affected Persons to create awareness about RAP and mainly the Valuation exercise as shown in the table below. The PAPs had an opportunity to raise any concerns or inquiries regarding the resettlement process.

Table 0-3: Schedule of RAP Awareness Meetings

S/NO	Date	Venue	Target Audience
1.	8 <sup>th</sup> December 2022	First Baptist Church	PAPs at Maili Tisa and Enkokidong'oi Village
2.	4 <sup>th</sup> April 2023	Elim Full Gospel Church	PAPs along the Sewer System (Namanga and Ormaneki)
3.	5 <sup>th</sup> April 2023	First Baptist Church	PAPs at Maili Tisa and Enkokidong'oi Village

The hosting community for the dam and water transmission lines accept the project. However, the PAPs along the Sewerage System (Trunk Lines and WWTP) have not fully accepted the project. There is need for more sensitization in the area and provision of additional benefits such as being part of the water supply during distribution. The land owner at the proposed WWTP is not willing to be physically displaced by losing his entire land parcel of 100 acres. He indicated he can only part with 50 acres.

## ES8: Valuation and compensation issues

Property valuation in Kenya is carried out by valuation professionals registered under the Valuers Act Cap. 532 of the laws of Kenya. A registered Valuer (with Valuers Registration Board) is a trained professional who has a thorough knowledge and understanding of the factors that create, maintain, or diminish values of real estate or assets. Valuation of assets is done in accordance with the Practice Statements and Guidance Notes published by the International Valuation Standards Committee (IVSC), adopted and recognized by international accounting standards and risk management professionals.

Valuation methodology adopted as determined by the Valuer when undertaking the Valuation exercise was a Comparative Sales Approach (Market Comparables Approach).



## ES9: Compensation and Resettlement Strategy

The Kenya Constitution 2010 allows the government and local governments to acquire land for the purpose of community betterment or the public interest.

Eligibility for compensation include

- a) Part or whole parcels of his or her land is tagged for compulsorily acquisition for the effective implementation of the Project;
- b) S/he occupied this land earmarked for project activities, prior to the cut-off date – i.e. the date recommended for the census.
  - The entitlement ‘cut-off’ date refers to the time when the census and assessment of PAPs and their property in the project area were carried out and ended. This was explained to the community members and PAPs during community dialogues and the PAP census. The date shall be set by NLC when undertaking the actual acquisition process during the project implementation.
- c) His or her rights or claim to the tagged land falls into any of the following categories:
  - Formal legal rights to land as recognised by the national and customary Laws of Kenya. Persons considered here are those that hold leasehold land, freehold land and, land held within the family or passed on through generations.
  - No formal legal rights to the land or assets at the time the census begins, but has recognised claim of use of such land or ownership of assets through the national and customary Laws of Kenya. Persons taken into account here are those that come from outside the country and have been given land by the local dignitaries to settle, and or to occupy.

No recognisable legal rights or claim to the land s/he is occupying, using or getting his or her livelihood from. Persons allowed under this considered here include encroachers and illegal

There are two forms of compensation PAPs are entitled to – Cash compensation and non-monetary or in kind compensation.

In addition to the compensation, the Project proposes livelihood improvement interventions such as:

- Capacity building which includes access to financial training for the PAPs to enhance the sustainable use of cash compensation.
- Construction of social infrastructure such as road improvements, equal access to employment opportunities during construction, financial and entrepreneurial training.

## ES10: Grievance Redress Mechanism

In line with IFC requirements, the Grievance management provides for three tiers of amicable review and settlement, with the first tier at the site level, second level will integrate a mediation committee in case the grievance cannot be solved at first level and finally there will be an option for each of the complaint to resolve to the court of law (third level) in case there is no resolution of the grievance with the mechanism

## ES11: RAP Implementation

Both PAPs will be compensated before clearance for construction commences. Client will be the lead agency in the RAP implementation and will work together with the County and National Governments in the PA to implement the RAP. TAWWDA will establish a RAP





Implementation Unit (RIU), to implement this RAP ensuring that PAPs promptly access their compensation entitlements and that their livelihoods are restored after resettlement.

### RAP Budget

The estimated RAP budget for all components is summarised in Table 0-4. Table 0-5 and 0-6 provide the separate RAP budgets for Dam & Water Transmission and the Sewerage System respectively.

*Table 0-4: Estimated RAP Budget for all Components (Dam, Water Transmission & Sewerage System)*

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition + forest material	402,172,931
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>402,482,931</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	40,248,293
	<b>Total Cost 2</b>	<b>442,731,224</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	55,341,403
	<b>GRAND TOTAL</b>	<b>498,072,627</b>

*Table 0-5: Estimated RAP Budget for Dam & Water Transmission*

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition	149,437,283
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>149,747,283</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	14,974,728
	<b>Total Cost 2</b>	<b>164,722,012</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	20,590,251
	<b>GRAND TOTAL</b>	<b>185,312,263</b>

*Table 0-6: Estimated RAP Budget for Sewerage System*

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition	281,415,530
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>281,725,530</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	28,172,553



	<b>Total Cost 2</b>	<b>309,898,083</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	<b>38,737,260</b>
	<b>GRAND TOTAL</b>	<b>348,635,343</b>

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## **ACRONYMS/ABBREVIATIONS**

ACC	Assistant County Commissioner
ADF	African Development Fund
AfDB	African Development Bank
CSOs	Civil Society Organizations
DCC	Deputy County Commissioner
DPs	Displaced Persons
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESAP	Environmental and Social Assessment Procedures
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FI	Financial Intermediaries
GO	Grievance Officer
IVSC	International Valuation Standards Committee
KFS	Kenya Forest Services
M & E	Monitoring & Evaluation
MIC-TAF	Middle-Income Country Technical Assistance Fund
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
PAP	Project Affected Persons
RAP	Resettlement Action Plan
RCC	Roller Concrete Compacted
RIU	RAP Implementation Unit
TAWWDA	Tanathi Water Works Development Agency
WaSSIP	Water Supply and Sanitation Service Improvement Project
WRM	Water Resources Management
WSS	Water Sanitation Services
WTP	Water Treatment Plan

## DEFINITION OF TERMS USED IN THIS REPORT

The following terms shall have the following meanings, unless the context dictates otherwise<sup>1</sup>:

**Census:** A field survey carried out to identify and determine the number of Project Affected Persons (PAP) or Displaced Persons (DPs). The meaning of the word also embraces the criteria for eligibility for compensation, resettlement and other measures emanating from consultations with affected communities.

**Project Affected Person:** This is a person affected by land use or acquisition needs of the Water Supply and Sanitation Service Improvement Project (WaSSIP) in Kenya. The person is affected because s/he may lose “title to land or right to its use”, and/or “title rights or other rights to structures constructed on the land” (thus s/he may lose, be denied, or be restricted access to economic assets, shelter, income sources, or means of livelihood). The person is affected whether or not s/he must move to another location.

**Compensation:** The payment in kind, cash or other assets given in exchange for the acquisition of land including fixed assets thereon.

**Cut-off date:** The date of commencement of the census of PAPs or Displaced Persons within the project area boundaries. This is the date on and beyond which any person whose land is occupied for project use, will not be eligible for compensation.

**Displaced Person:** A person who, for reasons due to involuntary acquisition or voluntary contribution of their land and other assets under the project, will suffer direct economic and or social adverse impacts, regardless of whether or not the said Displaced Person is physically relocated. The person will have his or her standard of living adversely affected, whether or not s/he must move to another location. S/he will lose right, title, interest in any house, land (including premises, agricultural and grazing land) or any other fixed or movable assets acquired or possessed, lose access to productive assets or any means of livelihood.

**Involuntary Displacement:** The involuntary acquisition of land resulting in direct or indirect economic and social impacts caused by: loss of benefits from use of such land; relocation or loss of shelter; loss of assets or access to assets; or loss of income sources or means of livelihood, whether or not the Displaced Person has moved to another location or not.

**Involuntary Land Acquisition:** This is the repossession of land by government or other government agencies for compensation, for the purpose of a public project against the will of the landowner. The landowner may be left with the right to negotiate the amount of compensation proposed. This includes land or assets for which the owner enjoys uncontested customary rights.

**Land:** This refers to agricultural and/or non-agriculture land and any structures thereon whether temporary or permanent and which may be required for the Project.

**Land Acquisition:** This means the repossession of or alienation of land, buildings or other assets thereon for purposes of the Project.

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<sup>1</sup> Water Supply and Sanitation Service Improvement Project (WaSSIP). 2007. Resettlement Policy Framework, RP 583. Government of the Republic of Kenya.

# **1 CHAPTER ONE: INTRODUCTION**

## **1.1 Project Background**

Tanathi Water Works Development Agency (TAWWDA), an implementing agency has received funding from The Ministry of Water & Sanitation and Irrigation (MoWSI) for the Detailed Studies and Design of Namanga Dam Water Supply and Sanitation Project. This mission is in line with requirement of Vision 2030 and is aimed at augmenting water supply and sanitation services to meet the current and futuristic water supply and sanitation demands for Namanga Town and neighbouring urban centres.

TAWWDA is the legal Agency mandated with construction of water works within Machakos, Kitui, Makueni and Kajiado counties. Prior to 3rd May 2019, TAWWDA was known as Tanathi Water Service Board (TAWSB). The Agency is mandated to undertake the development, maintenance, and management of National public water works within the area of jurisdiction. The Agency is also mandated to operate the water works and provide water services as a water provider, until such a time as a responsibility for the operation and management of the waterworks are handed over to a County Government. The Agency provide technical services and capacity building to such County Governments and water services providers within its areas as may be requested and provide to the Cabinet Secretary technical support in the discharge of his or her functions under the Constitution of Kenya and the Water Act 2016.

In the present study assignment, TAWWDA has contracted Ms. Runji Consulting Group Ltd to undertake the Detailed Design of Namanga Dam Water Supply and Sanitation Project. The Consultant commenced the studies on 25<sup>th</sup> May 2021. The conclusion of the assignment will be marked by the finalisation of design reports, tender documents, ESIA report and RAP report for the Project.

Prior to the present assignment, the Agency engaged Ms Seven Seas Consultants Limited for the Feasibility Studies and Preliminary Designs, cost estimates and tender documentation of the Project. The studies concluded in June 2020, recommended further investigations on construction of Namanga Dam, water treatment plant, water distribution to serve Namanga Town and Maili Tisa Town Centre.

Namanga Town and its environs fall under the arid and semi-arid lands (ASAL). The area receives low rainfall, experience frequent dry periods, seasonal rivers and has an acute shortage of clean water supply. The problem is compounded by the increased urban population induced by internal border activities. Also, the positive fruits of devolution have created more opportunities fuelling growth in what were small market centres and towns, turning the urban areas into busy commercial centres and local government administrative centres.

## **1.2 Project Location**

The proposed Project is located in Kajiado County, Kajiado Central Constituency. Namanga Town is located at the Kenya-Tanzania border at latitude S 2°32'39.8" and longitude E 36°47'20.2". The town is divided by the Tanzania-Kenya border with southern parts of the town in Longido District, Tanzania and northern in Kajiado County, Kenya. It is about 139km South-south East of Nairobi city and about 85km South of Kajiado Town via the A104 Nairobi-Namanga Road. The nearby Ol Doinyo Orok Hills, also known as Namanga Hills is located

northwest of Namanga town. Main source works for the proposed Project is a new dam to be designed across Namanga River within Ol Doinyo Orok hills.

The dam site is located at a distance of approximately 22km from Namanga Town. It is about 6km from Mile Tisa centre. The dam axis is at approximately coordinates 255820 E, 9729302 N, Arc 1960 / UTM zone 37S (latitude 2°26'59.57"S, Longitude 36°48'17.76"E).

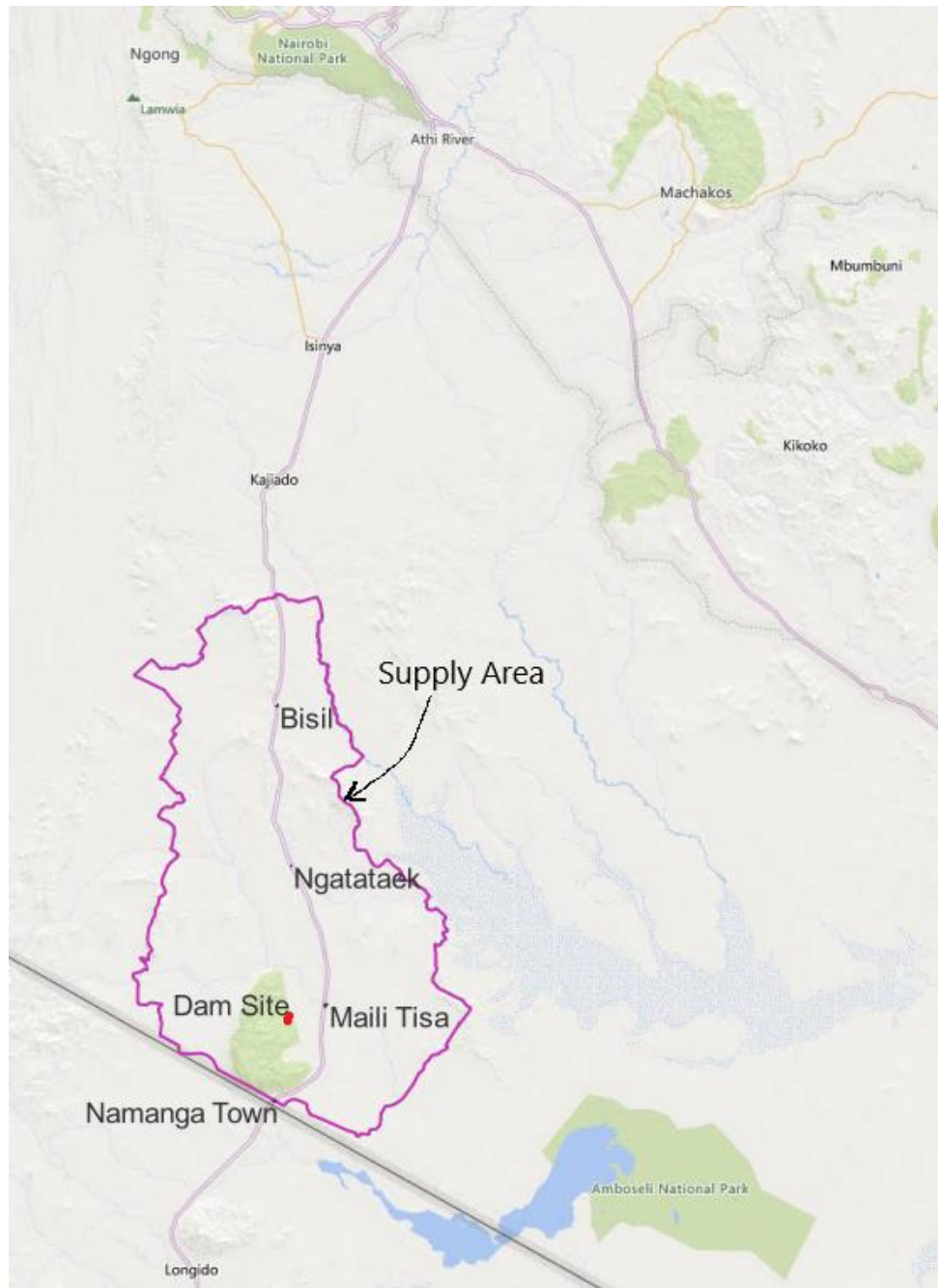


Figure 1-1: Project Location



The dam will supplement the existing water supply that include river intake and existing boreholes. The Project is located within Kajiado Central constituency. The Project mainly covers Matapato South and Matapato North wards.

The proposed dam is to supply water to Namanga Town, Maili Tisa Centre, Ngataek Centre, Bisil Town and all the settlements between these towns.

Sewerage works for this project is limited to Namanga Town. The proposed area for the Sewerage Treatment Plant is in Ormankeki Village, Namanga sub-location. To cater for collection and disposal of wastewater within the whole of Namanga Town, the stabilization ponds have been proposed at 8Km east of Namanga town. The co-ordinates of the ponds location are: 37M, 262044, UTM 971981 Namanga Location. The proposed Trunk is located along the river valley to give it adequate gradient for any future connections.



Figure 1-2: General Layout of Namanga Sewerage

### 1.3 Project Description

The key technical details of the proposed project study are as below;

- Design period: the current study has considered 2026, 2036 and 2046 as the initial, future and ultimate years respectively
- Ultimate population for the project area considered is of 77,150 (year 2046). The considered population translate to demand of 6,981m<sup>3</sup>/day. This includes domestic and all other demands including livestock, commercial, institutional...etc.
- Due to limited water availability from the catchment/ river, the proposed dam has been sized to supply 6000m<sup>3</sup>/day for the project area. This is 86% of the project area demands. The balance shall be supplied by other sources including existing boreholes and river intake.
- The proposed dam is to supply water to Namanga Town, Maili Tisa Centre, Ng'ataek Centre, Bisil Town and all the settlements between these towns. Sewerage works is limited to Namanga Town.
- Water pipelines that utilize gravity and solar powered pumped system
- Proposal for new boreholes
- Sewerage works for Namanga Town to include trunk sewers, and limited secondary and tertiary sewers
- Wastewater treatment ponds
- Ablution blocks

The specific features for each component are as discussed below:

#### 1.3.1 Dam Component

The key features of the dam are:

Table 1-1: Summary of the features of the proposed dam

Hydrology	River Basin	Namanga River
	Catchment area	12.5 km <sup>2</sup>
	PMF	186.32m <sup>3</sup> /s
	10,000-year flood	167.68 m <sup>3</sup> /s
	Spillway Design Flood	186.32m <sup>3</sup> /s
	Sediment yield	500 m <sup>3</sup> /km <sup>2</sup> /year
Reservoir	Full Supply Level (FSL)	1329 m
	Minimum Operation Level of the reservoir (MOL)	1319.5 m
	Maximum water level (MWL)	1331.1 m
	Gross storage capacity	1.21 Million m <sup>3</sup>
	Dead storage capacity	0.32 Million m <sup>3</sup>





	Live storage volume	0.89 Million m <sup>3</sup>
	Area to be inundated at full Supply level	0.121 km <sup>2</sup>
Main Dam	Type of dam	Rock fill dam with central impervious core
	Dam top level	1332.2 m
	Dam foundation level (deepest section)	1303.5 m
	Dam structural height	28.7 m
	Crest length	355 m
	Crest width	9.5 m
	Upstream slope	1: 2.5
	Downstream slope	1: 2
	Embankment fill volume	163,000 m <sup>3</sup>
Spillway	Design discharge	186.32m <sup>3</sup> /s
	Type of spillway	Non-gated overflow with cement lined chute
	Spillway crest level	1329 m
	Spillway crest length	30 m
Stilling Basin	Width of stilling basin	30 m
	Length of stilling basin	16 m
Intake	Location	On upstream face of dam on Left bank
	Type	Concrete tower with 3 openings. Dry wells
	Design discharge	Domestic water: 0.069 m <sup>3</sup> /s; Environmental flow: 0.047 m <sup>3</sup> /s;
Coffer Dam	Type of dam	Rockfill dam with clay core
	Dam top level	1322 m
	Dam foundation level	1304 m
	Dam height above river bed	11m
	Crest length	225 m
	Crest width	4 m



	Upstream slope	1: 2.5
	Downstream slope	1: 2
	Size	Box culvert, 2.5m x 2.5m
	Length	145m
	Type	Reinforced concrete

### 1.3.2 Gravity Raw Water Mains

- 160m long, 350mm diameter steel gravity raw main from the Dam downstream control chamber to Treatment plant.

### 1.3.3 Water Treatment Plant

- Inlet Chamber and Inlet Channel. Simple Flow Measurement of incoming water will be taken in the Inlet Channel;
- Flocculation preceded by Chemical Dosing of Soda Ash and Alum; 2.5m x 2.5m x 2.5m deep
- Sedimentation - Horizontal Flow Tanks; 3No. horizontal flow tanks, each 17m x 6m, depth varying from 2.5m to 3.0m. Surface overflow rate 1.6 m<sup>3</sup>/m<sup>2</sup>/hr
- Filters - Rapid Gravity Sand Filtration; 4 Nr of filters, 4.5m x 3.5m Dimensions, Rate of filtration 5m<sup>3</sup>/m<sup>2</sup>/hr
- Disinfection by Chlorination; Chemical Building equipped
- pH Correction - Soda Ash Dosing;
- Clearwater tank; 30.5m by 30.5 m and 5.21m high. The capacity of the tank is 3500m<sup>3</sup>
- Backwashing using water only; Tank is 212m<sup>3</sup>, providing water by gravity for backwashing
- Administration, Chemical & Chlorine Dosing Building, Pump house and, Staff Housing etc. and other Ancillary Works
- 2No. Sludge Drying Beds, 1.25m deep and with a total area of 61.2m<sup>2</sup>.

### 1.3.4 Water Supply Transmission and distribution

- HDPE 560mm PN8 Gravity main from the Water Treatment Plant To Pump Station 1– 9,397.2m
- Steel 300mm PN25 Rising main from Inkati Pump Station 1 To Oloilai Pump Station 2– 24,133m
- HDPE 400mm PN25 Rising main from Oloilai Pump Station 2 To Lenkishon Tank 3 – 11,111.76, m
- HDPE 125mm PN16 Gravity main from Lenkishon Tank 3 To Tank 4 in Bisil – 10,929m



- HDPE 450mm PN10 Rising main from Inkati Pump Station 1 To Tank 1 – 3,940m
- HDPE 355mm PN10 Gravity main from Tank 1 To Distribution System Offtake 2 – 7,580m
- HDPE 280mm PN10 Gravity main from Offtake 2 To Distribution System Offtake 3- 860m
- HDPE 225mm PN8 Gravity main from Offtake 3 To Namanga Town Distribution - 618.80m
- Storage tanks in four tanks in total: 1 No. 100m<sup>3</sup>, 1 No. 150m<sup>3</sup>, 1 No. 1,000m<sup>3</sup> and 1 No. 2000m<sup>3</sup>
- 2 No. pumping stations complete with pumps and solar farms in each.
- Rehabilitation of Existing Water Reservoirs
- Distribution Water Pipelines
  - HDPE DN 25 to DN 125mm pipeline – 32,067m
  - HDPE DN 250 pipeline – 7,575m
  - Steel DN 100 – 11,536m

### 1.3.5 Sewerage Works

- 3000m<sup>3</sup>/day full waste water treatment plant complete with Inlet works, Waste stabilisation ponds and associated works, Overflow/ outfall sewer, Sludge drying beds, Site works and access roads, Utility building, Staff houses
- 8.1km 500mm dia HDPE sewer line
- 1km 400mm dia HDPE sewer line
- 10.9km 300mm dia HDPE sewer line
- 1.417km 250mm dia HDPE sewer line
- 7-No. Ablution blocks (Including provision of 4 No. of exhausters and 2 No. of flashing units)

### 1.4 Scope of the proposed Project

The main scope of the assignment is to undertake the following:

- To carry out detailed designs and tender documentation for Namanga Dam Water Supply and Sanitation Project
- To provide the client with regular status reports and other reports as per the Terms of Reference, together with all related necessary technical assistance and professional advice to the Client related to supervision of the construction of the said works;
- To prepare and assist in the implementation of Resettlement of Project Affected Persons (RAP).



## 1.5 RAP Objectives

This Resettlement Action Plan (RAP) is prepared in accordance to the Kenyan Constitution and other framework such as the operational policies developed by Financiers such as World Bank and AfDB. RAP ensures that PAPs who are faced by any economic or physical displacement resulting from a project, whether permanent or temporary, will be resettled in socially responsible manner and according to good international practice.

Therefore, the main purpose of this Resettlement Action Plan (RAP) was to understand the socio-economic characteristics of the Project Affected Persons who are likely to be displaced during the project implementation. It also seeks to provide a detailed plan on how the affected persons will be resettled and their livelihoods restored to a better position than they were before the project. The RAP report also seeks to quantify and value the assets or individual properties in order to secure funds that will be used for compensation during project implementation.

In this regard, the specific objectives and tasks related to the RAP process are as follows:

- Undertake a socio-economic survey of the communities along the proposed project site.
- Conduct a census of the affected persons.
- Develop an eligibility criteria and establishment of a cut-off date.
- Evaluate and prepare an inventory of the affected properties
- Evaluate all other socio-economic costs.

## 1.6 Approach and methodology

Participatory approach was employed throughout the process which is key in enhancing Project ownership and acceptance. The engagement of stakeholders targeting both the secondary and primary stakeholders was done.

Both qualitative and quantitative methodologies were explored and the data triangulated at the analysis stage. The following techniques were employed:

### 1.6.1 Qualitative Technique

#### 1.6.1.1 Literature review:

This entailed a desktop research of existing literature to understand the previous and existing socio-economic conditions within the project area. The reports that were reviewed include:

- i. Kajiado County Integrated Development Plan (2018-2022)- The review intended to relate how the plan influences land uses within the project area. It also sought to determine if the County Government had plans for finding alternative water sources and determining how they can be fed into the designed system.
- ii. Kajiado County Spatial plan (2019-2029)-The review was aimed at determining if the County had planned any development activities such as the establishment of a Sewerage plant for Namanga town and any future plans for the towns within the project area.
- iii. Annual Development Plan (2020-2021)-During this financial year, the County Government of Kajiado sought to enhance availability and sustainable management of water and sanitation for all.
- iv. Feasibility Study Report by Seven Seas Consultants Ltd 2020- The Consultant had conducted a socio-economic baseline assessment that would be used to evaluate the socio-economic wellbeing of the individuals within the project area.



- v. The Constitution of Kenya-A review of legal and policy framework was essential in order to establish the land use rights within the project area and other regulations that needed to be adhered to during the project implementation.
- vi. Financiers Policies and guidelines on implementation of the Social Safeguards. IFC, World Bank and the African Development Bank (AfDB) have operational policies and guidelines on involuntary resettlement.

#### **1.6.1.2 Stakeholder Consultations**

Stakeholder consultation and public forums on the project were convened across the project area targeting the women, youth, trader's associations and civil society groups. Key informant interviews using an open ended questionnaire were also conducted in various departments at the County Government such as the Department of Water, Lands, Environment & Natural Resources, Health, Kenya Forest Services.

Public meetings that targeted the project affected persons whose private land will be acquired for the implementation of the project were conducted on 8<sup>th</sup> December 2022, 4<sup>th</sup> April 2023 and 5<sup>th</sup> April 2023. The meetings were aimed at creating awareness about the land acquisition process, the valuation methodology that is considered and address any concerns of the PAPs.

### **1.6.2 Quantitative Techniques**

#### **1.6.2.1 Socio-economic survey:**

The collection of socio-economic data conducted was conducted using a structured questionnaire that was administered in the field by enumeration clerks. Interviews were done amongst individuals, households and businesses within the project area to establish their socio-economic features like sex and age distribution, source of income, levels of income, literacy levels, sources of water for domestic use, human waste disposal approaches and status of land ownership.

#### **1.6.2.2 Census Survey**

An asset inventory of property that would be affected was also compiled by the Valuer based on the design of the dam, water treatment plant, transmission pipeline, storage tank areas, trunk lines and Waste water treatment plant. The Valuation report has been annexed to this RAP Report.



## 2 CHAPTER TWO: SOCIO-ECONOMIC BASELINE CONDITIONS

### 2.1 Introduction

The socio-economic survey is an essential aspect when planning for resettlement of the affected persons. The primary data is collected in order to understand the existing social conditions and determine how they might be affected by the project implementation. According to the World Bank Environmental and Social Framework, the condition of the Project Affected Persons should be improved by a project and not worsened. Therefore, the primary data helps in assessing and monitoring their wellbeing throughout the project cycle.

The survey was conducted for five days from 12<sup>th</sup> September 2022 to 17<sup>th</sup> September 2022. The sociologist trained a team of twelve (12) enumerators who were sourced locally and worked in pairs. A questionnaire was used as a data before embarking on data collection in Namanga, Maili Tisa, Bissil, and Ngatataek towns. Other areas where the questionnaires were administered include within the Enkokidong'oi village (hosts of the dam) and Ormankeki village (hosts of the WWTP). A summary of the target areas is as shown in the table below:

Table 2-1: Summary of targeted areas for the Socio-economic Survey

Project Component	Target Area
	Sub Location/Town/Village
Water Supply	Il Bisil
Water Supply	Ng'atataek
Water Supply	Elenuata (Maili Tisa town center)
Water Supply	Namanga town
Sewerage System	Oloolaroi (Ormankeki Village)
Dam, WTP, Access Road, & Raw Water	Eng'aboli (Enkokidong'oi village)

The collected data was analysed using Statistical Packages for Social Scientists (SPSS) software and the findings are as represented and discussed in section 2.3.

### 2.2 Objectives for the Data Collection

The specific objectives for collecting the socio-economic data include:

- To determine the social characteristics of the individuals and businesses within the project area
- To identify the vulnerable and directly affected project affected persons
- To identify the potential project impacts particularly on the livelihoods of the PAPs.
- To identify the concerns and preferences of the PAPs.

### 2.3 Socio-economic characteristics of the PAPs.

#### 2.3.1 Sex and Age Distribution

From the data analysis, majority of the people living within the project area are aged between 18-47yrs with the largest population being those between 28-37yrs (34.4%) as shown in Table 2-2 below. This implies that the participants between the 18-47years have proper comprehension, attitude and practices towards the project. They were able to understand the





project and express their views, concerns and more so negotiate on the benefits that they can obtain from the project implementation through Corporate Social Responsibility.

Table 2-2: Distribution of respondents by age

Age (Years)			
		Results (n)	Percent (%)
Unknown		13	6.2
18-27yrs		42	20.1
28-37yrs		72	34.4
38-47yrs		58	27.8
48-57yrs		17	8.1
Above 57		6	2.9
Below 18		1	.5
Total		209	100.0

In terms of sex distribution, the male respondents were 117 (56%) while the females were 81 (38.8%) as indicated in Table 2-3 below.

Table 2-3: Distribution of respondents by sex

SEX			
	Frequency		Percent (%)
Unknown	11		5.3
Female	81		38.8
Male	117		56.0
Total	209		100.0

### 2.3.2 Sources of Income and Distribution

Out of the 209 respondents who were interviewed along the project area, it is evident that they engage in both formal and informal employments. The different sources of incomes depend on the occupation of the respondents with the highest being self-employed (41.63%) followed by those in formal employment earning a wage/salary (33.01%). The self-employed individuals comprise mainly of business owners/traders. The main business that the locals engage in is livestock rearing. Other businesses include retail shops selling variety of products that range from food items, clothing, hotels & restaurants at the town centres. Another major activity that the respondents engage in is farming of vegetables although it is mainly subsistence farming that is done in small-scale. Another source of income is contribution from family members, but this was observed among the elderly families who rely on their children and other family members for sustenance. 5.74% were unwilling to disclose their sources of income. Figure 2-1 below illustrates the different sources of income among the respondents.



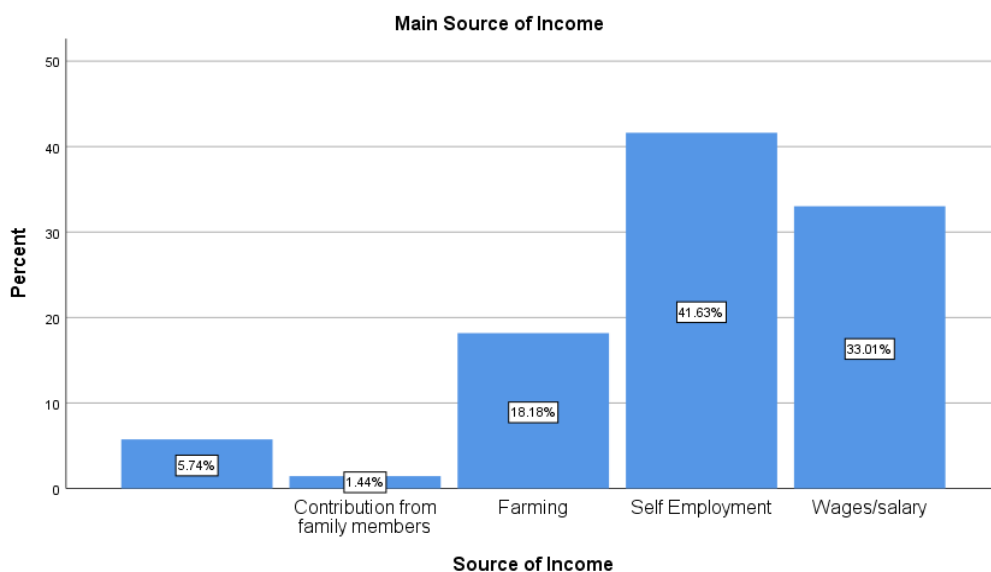


Figure 2-1: Sources of income among respondents

An analysis of the income distribution indicates that the level of income is quite low as most of the respondents indicated they earned below KES 10,000 in a month. 27.8% respondents earned between KES 5001-10000 while 21.5% earned below KES 5,000. Kenya is experiencing a high cost of living currently and as the fuel prices continue to rise, the prices of consumer goods is expected to continue rising. This implies that the levels of poverty within the project area are expected to increase sharply. However, if the proposed project is implemented, income generating opportunities such as hawking of foods to the labourers, supplying of sand contracts, employment opportunities for casual labourers will be offered to the locals and help in boosting the income levels. Additionally, once the water supply situation is improved, the time spent sourcing for water can be used to engage in income generating opportunities.

Most importantly, if there are any sources of livelihoods that will be affected by the project, adequate compensation should be offered to the affected person to ensure their live is not interfered with, but rather improved. The project design was significantly adjusted to ensure the transmission lines utilize the road corridor. It is mainly along the trunk line for the sewerage system where a wayleave and the WWTP traverses across private land necessitating acquisition.

Table 2-4: Income levels among respondents

INCOME DISTRIBUTION		
Monthly Income Range (KES)	No of respondents (n)	Percentage (%)
Unknown	29	13.9
< 5000	45	21.5
5001-10000	58	27.8
10001-15000	28	13.4
15001-20000	20	9.6
20001-50000	21	10.0



50001-100000	5	2.4
100001-250000	2	1.0
250001-500000	1	.5
Total	209	100.0

### 2.3.3 Education Level

From the data collected, only 23.4% of the respondents lacked formal education while a majority 37.3% had secondary education, 15.3% primary education, 12.9% had attained college/university diploma/degree with only 3.3% having pursued post graduate education. The education level in the area indicates that majority of the population can provide unskilled labour during the construction phase. Opportunities for the skilled labourers who meet the necessary qualifications will also be offered to the community.

The low number of respondents who have attained diploma/degrees can be attributed to several factors. For instance, the lack of institutions of higher learning within the project area and in Oloilai Sub county, cultural practices such as early marriages and teenage pregnancies, natural calamities like severe drought and famine.

Table 2-5: Level of education of the respondents

Education Level		
Education Levels	Number of respondents (n)	Percentage (%)
Unknown	16	7.7
No formal education	49	23.4
Primary	32	15.3
Secondary	78	37.3
College/University	27	12.9
Post graduate	7	3.3
Total	209	100.0

### 2.3.4 Water Sources

The residents within the rely on a variety of sources of water for their domestic use. 27.8% of the respondents reported that the main source water is from boreholes while 25.4% reported that they purchase water from water vendor/kiosks. (See Table 2-6 below) 20.6% have piped water into their homesteads, but the water is rationed whereby it is only available once a week. This indicates that water scarcity is a main challenge in Namanga that intensifies during the dry season. The respondents incur high expenses as they source for water for their household use. It is reported that women have to walk long distances in search of this precious commodity. Therefore, implementation of the project would have a positive significant by ensuring ease of access to water. 0.5% of the respondents who stated that they sourced water from the river stated that it was an option mainly during the rainy season because the river dries up during the dry season.



Table 2-6: Sources of water among the respondents

Sources of Water		
Sources of Water	Number of Respondents (n)	Percentage (%)
Unknown	14	6.7
Borehole/well	58	27.8
Piped water into plot/dwelling	43	20.6
Protected spring	1	.5
Public tap	39	18.7
River	1	.5
Water vendor/kiosk	53	25.4
Total	209	100.0

### 2.3.5 Sanitation

Namanga town has no Sewerage system. The residents build houses with septic tanks that are drained using exhausters at a fee. Based on the data collected, 79.9% of the respondents rely on pit latrines as their main mode of human waste disposal. Only 1% have flush toilets that drain into septic tanks while 12% rely on the bush/flying toilets as shown in Table 2-7 below. Upon the project implementation, the waste water is expected to increase and the cost of draining the Septic tanks by the private exhausters might be high due to the high demand for the services. Additionally, if the wastewater is not properly managed, it could pose a public health hazard and cases of waterborne diseases could be reported in the area. Therefore, the project seeks to implement a Sewerage system in Namanga town and expand the services to the other town in future.

Table 2-7: Mode of human waste disposal among the residents

Mode of Human Waste Disposal		
Mode of human waste disposal	Number of respondents (n)	Percentage (%)
Unknown	15	7.2
bush/flying toilet	25	12.0
Flush toilet to Septic Tank	2	1.0
Pit Latrine	80	38.3
VIP	87	41.6
Total	209	100.0

### 2.3.6 Land Ownership

In Kajiado County, land ownership is classified into three namely communal, private, and public land. Most of the land is registered either leasehold or freehold interest. An estimated 95 percent and 5 percent of land in rural and urban areas is registered and titled respectively. The mean land holding size in the county stands at nine (9) Ha in small scale and 70 Ha on large scale.

From the data collection, 62.7% of the respondents indicated that land ownership within the project area is freehold as indicated in Table 2-8 below. However, 26.8% of the respondents did not know. This implies the need for public sensitization on land ownership within the



project area. It was also observed that most of the land owners lack title deeds, instead they possess allotment letters as proof of ownership. Some of the few respondents who have title deeds are yet to begin the succession process.

Table 2-8: Land Tenure System

Land Tenure System		
Land Tenure	Number of respondents (n)	Percentage (%)
Unknown	11	5.3
Do not know	56	26.8
Customary	1	.5
Freehold	131	62.7
Leasehold	3	1.4
Public	7	3.3
Total	209	100.0

During the RAP Awareness meetings, the Valuer explained to the affected persons the process of acquisition and urged those who have not commenced on the succession process to do so.



### 3 CHAPTER THREE: LEGAL AND INSTITUTIONAL FRAMEWORK

#### 3.1 Introduction

One of the requirements of ESIA report is to interrogate the necessary and relevant laws that govern the establishment of the projects. It is part of Legal requirements within the Laws of Kenya that a development of such magnitude adheres to certain legal parameters.

Similarly, the RAP as an important part of ESIA, has been prepared in compliance with the requirements of the relevant national legislation of the Republic of Kenya. The process and procedures of land acquisition for the Namanga Dam WSSP Project will be principally governed by Kenya land laws including; Land Act 2012, Land Registration Act 2012, National Land Commission Act 2012 as well as the AfDB OS 2

Kenya has several legislations that are related to land acquisition and resettlement. AfDB also has standards and guidelines on Involuntary Resettlement. The aim of these series of measures is to ensure that adequate mitigation measures are put in place by the project proponent to deal with any negative impacts on the project affected persons.

This chapter sets out the legal operating environment for acquisition of land. The chapter highlights major issues related to Kenyan land legislation with regards to involuntary resettlement in this RAP. It provides a brief overview of the Kenya land policy, and the Kenya's constitutional provisions related to land use, planning, acquisition, management and tenure, and more specifically the legislations related with land expropriation or acquisition, land valuation and land replacement.

#### 3.2 Relevant Legal Frameworks

Summary of the relevant legal frameworks are found below.

*Table 3-1: Legal Frameworks that the project will be submitted to*

Legal Framework	Requirements
The Constitution of Kenya 2010	Under Chapter 5 (Land and environments) in Part 2 (Environment and natural resources). Section 42 gives every person a right to a clean and healthy environment, which includes the right; and to have the environment protected for the benefit of present and future generations
Way Leaves Act (Cap. 292):	The Act provides for certain undertakings to be constructed e.g. transmission lines, pipelines, canals, pathways etc., though, over or under any lands. This project is under the provision of the Act. Section 3 of the Act states that the Government may carry any works through, over or under any land whatsoever provided it shall not interfere with any existing building or structures of an ongoing activity. Where the line touches buildings or interferes with people's livelihoods, the Act requires written consent of affected parties and compensation thereof.





Land Acquisition Act (Cap. 295):	This Act provides for the compulsory or otherwise acquisition of land from private ownership for the benefit of the general public. For the acquisition to take place, the minister responsible must issue a gazette notice. The Act also provides for full compensation to the affected parties.
The Registered Land Act, Cap 300, Laws of Kenya:	This provides for the absolute proprietorship over land (exclusive rights). Such land can be acquired by the state under the Land Acquisition Act. This is of particular relevance to way leave acquisition.
The Land Adjudication Act, Cap 95, Laws of Kenya:	This provides for ascertainment of interests prior to land registrations under the Registered Land Act.
National Land Commission Act 2012	The act establishes the National Land Commission with the purpose of managing public land and carrying out compulsory acquisition of land for specified public purposes.

### 3.3 National Relevant Laws

Adopted in August 2009, the National Land Policy (“NLP” or “Policy”)<sup>2</sup> provides an overall framework for new legislation and defining key measures required to address critical issues such as land administration, access to land, land use, and restitution related to historical injustices and an out-dated legal framework. Further NLP addresses constitutional issues such as compulsory acquisition and development control.<sup>3</sup> Section 45 of the NLP defines compulsory acquisition as “the power of the State to extinguish or acquire any title or other interest in land for a public purpose, subject to prompt payment of compensation.”<sup>4</sup> Under the current Constitution,<sup>5</sup> the Land Act 2012 empowers the National Land Commission (under the guidance of Minister for Lands) to exercise the power of compulsory acquisition on behalf of the State.<sup>6</sup> Similarly, the NLP empowers the National Land Commission to compulsorily acquire land.<sup>7</sup>

### 3.4 The Constitution of Kenya (2010)

The Constitution of Kenya, 2010,<sup>8</sup> which is the supreme Law of the land, protects the sanctity of private property rights and states that no property can be compulsorily acquired by the Government except in accordance with law.<sup>9</sup> Article 40(3) states:

<sup>2</sup>Sessional Paper No. 3 of 2009 on National Land Policy (referred to as the “National Land Policy” in this report) was adopted in August 2009 by the Ministry of Lands. Available at [http://www.lands.go.ke/index.php?option=com\\_content&task=view&id=238&Itemid=48](http://www.lands.go.ke/index.php?option=com_content&task=view&id=238&Itemid=48), accessed May 25, 2011.

<sup>3</sup> Development control is the power of the State to regulate the property rights in urban and rural areas and is derived from the State’s responsibility to ensure that the use of land promotes the public interest.

<sup>4</sup>Sessional Paper No. 3 of 2009 on National Land Policy, § 45.

<sup>5</sup> The Constitution of Kenya, 1963, was replaced in 2010.

<sup>6</sup> Land Act, § 6, 2012.

<sup>7</sup>Sessional Paper No. 3 of 2009 on National Land Policy, §233(d).

<sup>8</sup> The Constitution of Kenya, 2010, was adopted by the Government of Kenya on 27 August 2010. The full text is available at [http://www.kenyalaw.org/klr/fileadmin/pdfdownloads/Constitution/Constitution\\_of\\_Kenya2010.pdf](http://www.kenyalaw.org/klr/fileadmin/pdfdownloads/Constitution/Constitution_of_Kenya2010.pdf), accessed May 25, 2011.

<sup>9</sup>Constitution of Kenya, art. 40.



*“The State shall not deprive a person of property of any description, or of any interest in, or right over, property of any description, unless the deprivation—results from an acquisition of land or an interest in land or a conversion of an interest in land, or title to land, in accordance with Chapter Five; or is for a public purpose or in the public interest and is carried out in accordance with this Constitution and any Act of Parliament that –*

- (i) Requires prompt payment in full, of just compensation to the person; and*
- (ii) Allows any person who has an interest in or right over, that property a right of access to a court of law.<sup>10</sup>*

The Constitution empowers the state to exercise the authority of compulsory acquisition. Land Act 2012 (LA) designates the National Land Commission (NLC) as the agency empowered to compulsorily acquire land.<sup>11</sup> Article 40 of the Constitution provides that the state may deprive owners of property only if the deprivation is "for a public purpose or in the public interest," which includes public buildings, roads, way leaves, drainage, irrigation canals among others. The state's exercise of this power is left at the discretion of NLC, and requires the state to make full and prompt payment of "just compensation" and an opportunity for appeal to court.

Article 40(3) (a) refers to acquisition and conversion of all kinds of land in Kenya (private, public, community land and foreign interests in land). The Constitution further provides that payment of compensation shall be made to “occupants in good faith” of land acquired by the state who do not hold title for such land.<sup>12</sup> An occupant in good faith is a “bona fide” occupant. On the other hand, under the Constitution, those who have acquired land illegally are not regarded as deserving any compensation.<sup>13</sup>

In addition to Article 40, Chapter Five of the Constitution is relevant to compulsory acquisition. This chapter, entitled "Land and Environment," is divided into two parts. Part 1 deals with land, and Part 2 deals with environment and natural resources. Part 1 of Chapter 5, articles 60 – 68, describes the principles of land policy. Land should be held, used and managed in a manner that is equitable, efficient, productive and sustainable and in accordance with security of land rights, sound conservation and protection of ecologically sensitive areas.<sup>14</sup> These principles must be implemented through a national land policy reviewed regularly by the national government and through legislation.<sup>15</sup>

### **3.4.1 The Land Act (1998) (CAP 227)**

The land act <sup>16</sup>(“LA”) is the Kenya’s framework legislation regulating compulsory acquisition of land (i.e. land, houses, easements etc.). The LA was adopted on 2<sup>nd</sup> may 2012 and provides

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<sup>10</sup> Id.

<sup>11</sup>The Land Act, 2012 The Government of Kenya, Section 8.

<sup>12</sup>Constitution of Kenya.Id. at art.40(5).

<sup>13</sup>Constitution of Kenya.Id. at art.40(3).

<sup>14</sup>Id. at art. 60.

<sup>15</sup>Id. at art.60(2).

<sup>16</sup> Land Act, 2012.

for sustainable administration and management of land and land-based resources including compulsory acquisition.

### 3.4.2 The National Land Commission Act

The National Land Commission (NLC), an independent government commission whose establishment was provided for by the Constitution of Kenya, 2010 to, amongst other things, manage public land on behalf of the national and county governments, initiate investigations into present or historical land injustices and recommend appropriate redress, and monitor and have oversight responsibilities over land use planning throughout the country.[1] It was officially established under The National Land Commission Act, 2012. Pursuant to Article 67 (2) of the Constitution, the functions of the Commission are:—

- To manage public land on behalf of the national and county governments;
- Compulsory acquire land for national and county governments
- Compensate acquired land on behalf of national and County government
- To recommend a national land policy to the national government;
- To advise the national government on a comprehensive programme for the registration of title in land throughout Kenya;
- To conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities;
- To initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress;
- To encourage the application of traditional dispute resolution mechanisms in land conflicts;
- To assess tax on land and premiums on immovable property in any area designated by law; and
- Monitor and have oversight responsibilities over land use planning throughout the country.

Under the National Land Commission Act, the Commission shall:

- On behalf of, and with the consent of the national and county governments, alienate public land;
- Monitor the registration of all rights and interests in land;
- Ensure that public land and land under the management of designated state agencies are sustainably managed for their intended purpose and for future generations;
- Develop and maintain an effective land information management system at national and county levels;
- Manage and administer all unregistered trust land and unregistered community land on behalf of the county government; and
- Develop and encourage alternative dispute resolution mechanisms in land dispute handling and management.
- Implement Settlement programmes on behalf of national and county governments as outlined in section 134 of the Land Act.
- Administer the Land Settlement Fund in accordance with section 135 of Land Act
- Manage the Land Compensation Fund

- Identify ecologically sensitive areas that are within public land and demarcate and take any other justified action on those areas and act to prevent environmental degradation and climate change in accordance with the Land Act.
- Reserve public land for the establishment of approved settlement programmes, and where public land is not available, purchase private land subject to the Public Procurement and Disposal Act, 2005 or any other law as provided for in section 134 (5) of the Land Act.
- Set aside land for investment purposes in accordance with section 12(3) of the Land Act.
- Approve compulsory acquisitions, wayleaves, easements and analogous rights.
- Ensure that the investments, in land benefit local communities and their economies.
- Make regulations prescribing the criteria for allocation of public land, such regulations to prescribe forms of ownership and access to land under all tenure systems.
- The procedure and manner of setting aside land for investment should respect mechanisms of benefit sharing with local communities.

As a result, NLC will compensate all affected PAPs, since legally they are the constitutional body charged with this responsibility.

### 3.4.3 The Valuation Act

Valuation of land is a critical aspect of compulsory acquisition practice and compensation. The National Land Commission based on land valuation determined by registered valuers will make compensation awards. Besides, the Valuers Act<sup>17</sup> establishes the Valuers Registration Board, which regulates the activities and practice of registered Valuers. All Valuers must be registered with the Board to practice in Kenya. The Board shall keep and maintain the names of registered Valuers, which shall include the date of entry in the register; the address of the person registered the qualification of the person and any other relevant particular that the Board may find necessary. The RAP team has made use of the services of registered Valuers who are approved by Valuers Registration Board.

### 3.5 African Development Bank Environmental Guidelines

AfDB OS 2 is a policy that provides a mechanism through which Project related resettlement issues are to be addressed. The specific objectives of this OS mirror the objectives of the involuntary resettlement policy to:

- a) Avoid involuntary resettlement where feasible, or minimise resettlement impacts where involuntary resettlement is deemed unavoidable after all alternative project designs have been explored;
- b) Ensure that displaced people are meaningfully consulted and given opportunities to participate in the planning and implementation of resettlement programmes;
- c) Ensure that displaced people receive significant resettlement assistance under the project, so that their standards of living, income-earning capacity, production levels and overall means of livelihood are improved beyond pre-project levels;
- d) Provide explicit guidance to borrowers on the conditions that need to be met regarding involuntary resettlement issues in Bank operations to mitigate the negative impacts of

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<sup>17</sup>The Valuers Act, Chapter 532, [http://www.kenyalaw.org/kenyalaw/klr\\_app/frames.php](http://www.kenyalaw.org/kenyalaw/klr_app/frames.php), accessed May 25, 2011.

displacement and resettlement, actively facilitate social development and establish a sustainable economy and society; and

- e) Guard against poorly prepared and implemented resettlement plans by setting up a mechanism for monitoring the performance of involuntary resettlement programmes in Bank operations and remedying problems as they arise

The Policy also covers economic, social and cultural impacts associated with Bank-financed projects involving involuntary loss of land, involuntary loss of other assets, or restrictions on land use and on access to local natural resources that result in;

- (a) Relocation or loss of shelter by the people residing in the project area of influence
- (b) Loss of assets (including loss of structures and assets of cultural, spiritual, and other social importance) or restriction of access to assets, including national parks and protected areas or natural resources; or
- (c) Loss of income sources or means of livelihood as a result of the project, whether or not the people affected are required to move.

AfDB OS 2 is therefore relevant to the **Namanga Dam Water Supply and Sanitation Project** as acquisition of private land is anticipated. The main features of this directive are as follows:

- (a) All viable alternative project designs should be explored to avoid or minimise the need for resettlement and when it cannot be avoided, to minimise the scale and impacts of resettlement.
- (b) Resettlement measures should include affected development activities in the affected community. The community should be assisted to improve former production levels, income-earning capacity and living standards, or at least restore them to the levels at which they would have been without the project.
- (c) Displaced persons should be:
  - Compensated at full replacement cost prior to commencement of construction;
  - Assisted with relocation; and
  - Assisted and supported during the transition period.

Physical relocation to new sites is anticipated. Therefore, PAPs should be considered for resettlement compensation at current market and replacement rates for the respective affected properties, where relevant. A 15 per cent disturbance allowance to assist the PAPs during the re-establishment transition period, including temporary loss of income, has been considered.

- (d) Vulnerable and socially disadvantaged groups should be considered in the RAP activities. These include groups such as the very poor, the disabled, minorities, refugees, orphans and child-headed families, squatters and others without clear legal rights to land, those incapacitated by advanced age, among others.
- (e) Communities should be given opportunities to participate in planning, implementing and monitoring their resettlement/compensation. This has been complied with and extensive community and stakeholder consultations undertaken. Also, the views of the community members and other stakeholders have been considered and integrated into the RAP.
- (f) Re-settlers should be helped with integration into their host community.





Table 3-2: Kenya Law vs AfDB Policy Guidelines

Kenya Law	AfDB Policy Guidelines	Recommendations to bridge gaps
Compensation for land and developments acquired for public purpose is paid for at the prevailing market price and in monetary form including an element for disturbance except where the beneficiary opts for alternative land equivalent to the value ascertained	Recommends land for land compensation. Other compensation is at replacement cost	Getting suitable land for the affected is proving challenging with time. Recommends land for land compensation. Other compensation is at replacement cost
Grievance redress mechanism is not adequately provided for	The mechanism is fully documented and the procedures laid down	Expedite the dispute resolution mechanism recently introduced by the judiciary
The Constitution of Kenya (2010), Section 60 (1) (f) seeks to eliminate gender discrimination in law, custom, and practices related to land and property.	AfDB Gender Policy (2001) reinforces the provisions of the Constitution by providing specific direction on how gender issues are to be handled in the course of the project.	This policy was adhered to during public consultation
Constitution recognizes public consultations before a project can be implemented, it does not stress on the co-operation and consultation of the Civil Society organizations.	On cooperation with Civil Society organizations, stresses on the need to consult and cooperate with the CSOs.	
Section 91 (1) of the traffic Act Cap 403, makes it an offense for any person to encroach on a road reserve by making or erecting any building, placing and advertisement sign or other obstacle, deposit any matter whatsoever, alters or obstruct any drainage under the control of highway authority without written permission from the authority. Section 91 (2) of the law further gives the authority power to remove the	Section 3.4.3 of the involuntary Resettlement policy provides for a third group of displaced persons who have no recognizable legal right on the land they are occupying in the project area. Examples According to the Policy, this category of displaced persons, will be entitled to resettlement assistance in lieu of compensation for land to sustain and improve their former living standards (compensation for loss of	





Kenya Law	AfDB Policy Guidelines	Recommendations to bridge gaps
obstruction, and the culprit is liable for prosecution.	livelihood activities, common property resources, structure and crops etc.), provided they occupied the project area prior to a cut-off date established by the borrow and acceptable to Bank. At the minimum, under the Bank's policy (with no contradiction to the borrower's legislation), land, housing, and infrastructure should be provided to the adversely affected population, including indigenous groups, ethnic, linguistic and religious minorities, and pastoralists who may have usufruct rights to the land or other resources taken for the project. The cut-off date must clearly be communicated to the project affected population. Persons who encroach on the project area after the cut-off date are not entitled to any form of resettlement assistance.	



## 4 CHAPTER FOUR: RESETTLEMENT IMPACTS

### 4.1 Introduction

The Construction of the Namanga Dam Water Supply and Sanitation Project will have resettlement impacts. The major impacts include:

- Loss of land-particularly at the dam area i.e. in Ol Doinyo Orok Forest and the WWTP site
- Loss of trees- Ol Doinyo Orok Forest comprises of mainly acacia trees and other indigenous trees that will be cut to pave way for the construction of the dam.
- Loss of crops- The families living downstream of the dam have engaged in small-scale farming and their crops are likely to be affected



Plate 4-1: Trees within the Ol Doinyo Orok Forest that will be affected by the Dam and WTP

### 4.2 Potential Impact of the Project

Affected land will be forest, residential and agricultural land. The impact will result in the permanent change of land use and the termination of the present use of the land. The direct impact of the project on PAPs in terms of the specific land parcels affected, sizes of land and affected owners will be determined during Valuation.

Table 4-1: Estimates of Affected Land Parcel for the various project components

Project Component	Acres	Ha
Dam area	64.2451	25.9996
Tank 1,3,4	0.997	0.4035
Pump station 1&2	3.5533	1.4380
WWTP	104.3822	42.2429



Access Road for Sewer	3.053	1.2355
Trunk Line	9.9235	4.0160
<b>Total</b>	<b>186.1541</b>	<b>75.3355</b>

The transmission mains and distribution lines are located along the road reserve with the aim of ensuring that there is minimal acquisition and displacement.

### 4.3 Project Affected Persons (PAPs)

Project affected persons (PAPs) are individuals whose assets may be lost and/or affected, including land, property, other assets, livelihoods, and/or access to natural and/or economic resources as a result of activities under the Namanga Dam Water Supply and Sanitation Project. During the asset inventory exercise undertaken by the Valuation team, 22 land parcels will be affected during the project implementation.

Category of impact in relations to PAPs have been identified namely;

- Project affected persons with trees
- Project affected persons with land

Generally, the design for Namanga Dam Water Supply and Sanitation Project. envisages the following disruptions and losses. Proposed against each anticipated disruption and loss is its mitigation measure(s).

#### a) Loss of Land and Proposed Mitigation Measures

The targeted project area comprises of a forested area as well as agricultural land. Loss of private land is inevitable based on the current design for the sewerage system (WWTP & Trunk lines), tank 1, 3 &4, pumping stations and access road to the sewer. Loss of land is also expected at the Ol Doinyo Orok Forest where about 64acres is needed for the construction of the dam and the Water Treatment Plant.

#### Proposed mitigation

- Compensate the affected persons whose private land is needed for the project implementation.

Table 4-2: Affected sizes of land to be acquired

Project Component	Acres	Ha
Dam & WTP area	64.2451	25.9996
Tank 1,3,4	0.997	0.4035
Pump station 1&2	3.5533	1.4380
WWTP	104.3822	42.2429
Access Road for Sewer	3.053	1.2355
Trunk Line	9.9235	4.0160
<b>Total</b>	<b>186.1541</b>	<b>75.3355</b>



## 5 CHAPTER FIVE: STAKEHOLDER ENGAGEMENT

### 5.1 Introduction

The overall goal of consultation and stakeholder engagement is to establish an ongoing dialogue with potentially affected parties and other interested organizations and individuals, so that their views and concerns can be taken into account in decisions about the Project. The consultation and stakeholder engagement activities of the RAP are entirely interwoven with the Project's Stakeholder Public Consultation which is provided in ESIA. In line with both the Government of Kenya and AfDB requirements, consultation with and participation of affected communities and individuals are key elements of the RAP development and - implementation process.

Another essential aspect of this participatory approach is the establishment mechanism to redress the grievances of affected people. The aims of community and stakeholder consultations were to:

- (a) Introduce Project implementation activities and potential impacts to the community members;
- (b) Identify the communal property and public infrastructure and facilities likely to be affected;
- (c) Identify the vulnerable social groups that may require special support;
- (d) Identify various socially and culturally acceptable resettlement and other mitigation alternatives;
- (e) Identify the community expectations and fears related to the resettlement compensations;
- (f) Explain to the community members the meaning of key concepts used under the RAP such as resettlement<sup>18</sup>, displacement, relocation and compensation, among others;
- (g) Explain to the community members the procedure for property identification and assessment for the PAPs

### 5.2 Stakeholder Analysis

Based on the Stakeholder identification and mapping exercise conducted under the ESIA, the primary stakeholders were specifically targeted during the RAP exercise. Table 5-1 indicates the specific interests of the various stakeholders.

Table 5-1: Analysis of the respective interests of the stakeholders

Stakeholder Name	Interest
TAWWDA	Improve the existing water system and meet the water demands in line with Vision 2030
OLWASCO	Obtaining water to supply to the public

<sup>18</sup> The concept of resettlement was explained to the PAPs as NOT only meaning physical displacement and relocation but also the loss of physical and economic assets and livelihood amenities and the necessary compensation measures to assist PAPs in restoring their livelihoods.



Stakeholder Name	Interest
<b>OWASCO</b>	Obtaining Water to supply to the public
<b>Enkokidong'oi Village Residents (dam site &amp; WTP)</b>	Understanding how the project safeguards their safety as the host community, in case of displacement, how resettlement will be undertaken.
<b>Ormankeki Village Residents (Proposed WWTP)</b>	Understanding how the project safeguards their safety and health as the host community, in case of displacement, how resettlement will be undertaken.
<b>Namanga, Maili Tisa, Ng'ataek &amp; Bisil Town centre residents</b>	Understanding how the water transmission and distribution lines might affect their livelihoods especially during the construction of the pipelines.
<b>County Government of Kajiado-</b>	Ensuring consistent water supply and sanitation needs in the county are met.
<b>KFS</b>	Ensuring the forest is not destroyed.
<b>KWS</b>	Ensuring the wild animals remain safe
<b>NLC</b>	Ensuring they acquire the land needed for the project implementation on behalf of the Government
<b>NEMA</b>	Adequate Environmental and Social Impact Assessment is undertaken before the project construction
<b>WRA &amp; WRUA</b>	Proper management and use of water resources
<b>Politicians (MCA, Ward Administrators, MP etc.)</b>	The residents within their area of jurisdiction access and enjoy amenities like water and proper sanitation
<b>Local Administration (CC, DCC, ACC, Chiefs &amp; Assistant Chiefs)</b>	Law and order are adhered to during the project implementation phases

Various stakeholders were targeted for consultation and to seek views / opinion and concerns about the project.

### 5.3 Stakeholder Sensitization on RAP Activities

The Consultant has been engaging both the primary and secondary stakeholders during the project period as indicated in the ESIA report. The local administration provided immense support in the organization of the public meetings.

For purposes of preparation of the RAP Report, the affected persons were the target audience for the awareness meetings that were held on the dates shown in Table 5-2 below. The PAPs raised several concerns and sought clarifications on various project aspects.

Table 5-2: Schedule of RAP Awareness Meetings

S/NO	Date	Venue	Target Audience
4.	8 <sup>th</sup> December 2022	First Baptist Church	PAPs at Maili Tisa and Enkokidong'oi Village





5.	4 <sup>th</sup> April 2023	Elim Full Gospel Church	PAPs along the Sewer System (Namanga and Ormankeki)
6.	5 <sup>th</sup> April 2023	First Baptist Church	PAPs at Maili Tisa and Enkokidong'oi Village

### 5.3.1 Summary of the RAP Awareness Meetings

#### a) Irrigation

The community reported that they appreciated the water for domestic use. However, they would also like a water provision for irrigation purposes as they have ranches near the dam area that can be cultivated.

TAWWDA noted the request and indicated that the water provision was beyond the scope of the project, but it will be considered as a future provision.

#### b) Water Supply Areas

The community sought information on the distribution of the domestic water to their households as the hosts of the project. They needed assurance that they would be supplied with the water because previous projects undertaken in the area made promises that were never kept.

The Consultant informed them that the current scope of works entailed designing of the dam, water transmission mains to Maili Tisa, Ngatataek, Bisil and Namanga towns. Additionally, the distribution component is limited to Namanga town. TAWWDA assured the community that once the design consultant completes their scope of works, designs for distribution would be done as the focus is to first secure the water resource i.e. the dam.

#### c) Displacement and Compensation

The Consultant's Valuer explained that displacement by projects is implemented where it is inevitable. Affected persons become eligible for compensation if their structure, trees, crops and land will be displaced. The Valuation methodology and how rates are determined was explained as well and urged the affected persons to ensure they have necessary documentation that would proof ownership of the assets such as land, lease or tenancy agreements as compensation is only done to the owners. In addition, he stated that the Consultant will undertake an asset inventory of the affected persons, but it will only be for purposes of budgeting by TAWWDA. During the project implementation, National Land Commission will be undertaking the compensation process as mandated by the Kenyan Constitution.

The community had enquired whether there would be an alternative land for mass relocation, but the Valuer explained that the constitution provides for two forms of compensation; land for land or cash for land. However, cash compensation is usually adopted.

#### d) Risk Assessment

The community enquired on whether the Consultant had taken any measures to identify the potential risks of the dam and provided for mitigation measures.

The Consultant discussed the design approaches adopted, field investigations such as the geotechnical and geophysical investigations used to ensure the stability of the dam and communicate any impending threats. He further stated that an Emergency Action Plan will be developed by the contractor indicating all the stakeholders, and their preparedness in case of





an emergency like dam break. Environmental and social risks have also been investigated and an Environmental and Social Management Plan developed that caters for the different project phases.

**e) Employment opportunities**

It was affirmed that the locals would be given first priority in employment during the construction phase of the project especially for the casual jobs. The vacant skilled labourers' positions will be advertised through the local administration to enable the locals who meet the required qualifications an opportunity for employment. Internship opportunities will also be provided to promote skill transfer to the locals.

**f) Corporate Social Responsibility (CSR)**

The Ol Doinyo Orok Community identified four projects to be considered as part of CSR during the construction phase. They include access roads, a hospital, secondary school and a storm water drainage system for the Maili Tisa Town centre. During the meetings it was reported that land for construction of the secondary school is available.

Other CSR projects that can be considered across the project area include water trough points for livestock and water kiosks.

A permanent access road will be tarmacked by the contractor to facilitate his movement during construction of the project and dam operations as well as to ease movement among the local people.

**g) Community Empowerment**

The community identified several income generation projects through its committee that would like to be considered for implementation once the project is complete. They include, bee keeping, power generation and fisheries. They also indicated that if the provision of water for irrigation is implemented they could engage in smallholder livestock feed project, domestic biogas,

A women empowerment project currently exists at Maili Tisa where they operate the Oloilali Milk Plant. The management requested for fencing of the facility to boost security or purchase of a cooler to increase their production capacity.

**h) Re-afforestation**

One of the major impacts of the project is loss of trees at Ol Doinyo Orok Forest. The Consultant has recommended for the planting of trees after the project construction in order to restore the environmental status of the area. The planting of the trees will be managed by the Kenya Forest Service and can be assisted with ensuring availability of seedlings. The Consultant recommends the tree planting not to be limited to the catchment area but across the project area.

**i) Billing**

During the meetings, it was reported that the water consumers will be billed monthly for their expenditure. The community were of the opinion that the water should be provided freely. However, the Consultant informed them that to ensure project sustainability, billing must be



done. TAWWDA explained that the water tariffs are set by the Water Services Regulatory Board (WASREB).

#### **j) Existing community water projects**

At the proposed dam area, there is existing community water projects whose operations will be affected by the project. The Consultant has provided for the relocation of the pipeline located at the reservoir to be placed around the dam. However, further discussions need to be made between the management of the water projects, OLWASCO and TAWWDA to determine if they will be provided with a bulk water pipeline that is metred thus ensuring continuous supply of the commodity or an alternative approach.

#### **k) Conflicts**

The community reported that the water scarcity challenge during the dry season results in increased human-wildlife conflict. TAWWDA needs to consider putting up water points for the animals to keep them away from the dam and the human households.

#### **l) Environmental impact concerns**

The community residing along the proposed WWTP (Ormankeki village) enquired on whether they would be affected by the smell from the WWTP. Additionally, in case of leakages along the trunk line, to whom do they report and how fast will the response be to avoid cases of contamination and risk of diseases?

The Consultant informed the community that the environmental recommendations include having a buffer zone where trees will be planted to contain the smell. OLWASCO will be managing the Sewerage system, therefore communication channels such as a hotline will be provided to the locals for reporting any incidents such as leakages.

### **5.4 Recommendations on Future Engagements**

Following the feedback from the stakeholders, below are the recommendations that the Consultant has made for TAWWDA's consideration during the implementation of the next phase of the project.

- i. The Ol Doinyo Orok Community (dam area) and the Ormankeki Community (Sewer area) formed their respective committees whose role is to provide support, help the community in decision making and general monitoring the project implementation. We recommend training of the committee members and organization of benchmarking trips to previously completed projects to help them perform their roles better.
- ii. The Affected Persons who have been identified as being eligible for compensation need to be taken through financial training before they are compensated. The financial knowledge will help them to properly utilize the awards to improve their wellbeing.
- iii. The Consultant has provided for offtakes along the transmission lines to Namanga, Ngatataek and Bisil. During the design of the distribution system, provision of water for livestock should be considered and water trough points provided within the project area.
- iv. In addition, the hosts of the WWTP and the trunk line need to be supplied with domestic water. This will help in promoting project acceptance.



PAP sharing his concerns during the RAP Awareness meeting



MCA Matapato South Ward sharing his remarks during the RAP Awareness meeting  
*Plate 5-1: RAP Awareness meeting held on 8th December 2022*





RCG Sociologist explaining the targeted water supply areas  
*Plate 5-2: RAP Awareness meeting on 4th May 2023*





RCG Project Engineer addressing the audience during the meeting

*Plate 5-3: RAP Awareness Meeting on 5th May 2023*



## 6 CHAPTER SIX: VALUATION METHODOLOGY AND STRATEGY

### 6.1 Introduction

Property valuation in Kenya is carried out by valuation professionals registered under the Valuers Act Cap. 532 of the laws of Kenya. A registered Valuer (with Valuers Registration Board) is a trained professional who has a thorough knowledge and understanding of the factors that create, maintain, or diminish values of real estate or assets. Valuation of assets is done in accordance with the Practice Statements and Guidance Notes published by the International Valuation Standards Committee (IVSC), adopted and recognized by international accounting standards and risk management professionals.

### 6.2 Valuation Methodology

#### 6.2.1 Comparative Sales Method (Market Comparables Approach Method)

This is the most realistic of all valuation methods. It is based on the comparison of the property to be valued with similar properties and the prices achieved from them, taking account of the differences between them. The comparability of the properties is based on the use of the property, location (characteristics of the neighbourhood), site area, site conditions, physical properties of the building (floor area, building materials used, amenities such as garage, etc.), and income related factors. The data to come up with an estimate market value is normally obtained from local land agents, Valuers, government departments, and other sources as necessary. Comparability is usually in respect of property transaction prices and market conditions. Each of these aspects has to be thoroughly analysed before accepting the method. The intention is to compare similar properties. For instance, agricultural land in one county may not be the same in another county, nor can residential property be compared with an industrial property.

This method of valuation is particularly constrained because of the general lack of market transactions. In some instances, property transactions are fairly secretive due to the controlled nature of the property market. Additionally, sales data often become historic due to effects of hyper-inflation making comparable sales analysis difficult.

The land estimate value in our case is based on Market Rate (commercial rate) according to Kenya law for sale of land or property. In terms of land, this may be categorized as follows;

- (a) Replacement cost for agricultural land: means the pre- program or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land,
- (b) Plus the costs of preparing the land to levels similar to those of the affected land; and
- (c) Any registration and transfer taxes; P-9

### 6.3 Valuation Strategy

The valuation report provides a strategy for resettlement compensation to ensure that the PAPs livelihoods are restored and/or improved before the land for the planned construction of the *Namanga Water and Sanitation project* is finally acquired. The strategies employed during the valuation of the access road are discussed below.





### 6.3.1 Valuation of Land

We first established the size of land to be affected and then we used the comparables sales data for recently sold land in the vicinity of the affected land. Comparable sales data was obtained from land sales agent in Namanga, fellow Valuers, chiefs and headmen in areas affected by the project, Kajiado Lands Registry, among other land dealers. This sales data was then adjusted and used to compute the compensatable amount for the affected land.

### 6.3.2 Valuation of Houses and Other Structures

In the valuation of houses and other structures, the following aspects were taken into consideration:

- The market cost of the materials to build a replacement structure with the area and quality similar to or better than those of the affected structure, or to repair a partially affected structure,
- Plus, the cost of transporting building materials to the construction site,
- Plus, the cost of any labour and contractors' fees, plus the cost of any registration and transfer taxes

**NB:** The proposed project does not affect structures hence no value has been assigned to them.

### 6.3.3 Valuation of Trees and/or Crops

For valuation of trees and/or crops, we relied on comparable data from various actors involved in compensation where similar projects have been conducted including Kenya Agricultural Research Institute (KARI) now Kenya Livestock and Research Foundation (KALRO), Department of Agriculture in the Ministry of Agriculture, Livestock and Fisheries, Rural Electrification & Renewable Energy Corporation (RE & REC), National Irrigation Authority (NIA), etc. Further, Under Kenya Resettlement Policy Framework 2017, trees and crops are supposed to be compensated using the guidelines from the Ministry of Agriculture and Kenya Forest Service.

**NB:** We did not assess the value of trees for the Kenya Forest Service land since we did not get access to the land. Further, most of the trees and/or crops along the project corridor are seasonal hence farmers/PAPs can be given adequate time to harvest.

## 6.4 Valuation cost

A field survey undertaken between 3<sup>rd</sup> April 2023 -10<sup>th</sup> April 2023 that sought to take an inventory of the affected assets within the project area as per the design, it was found that the major impact is loss of land at the proposed dam area and the sewerage system area.

Table 6-1: Estimates of Affected Land Parcel for the various project components

Project Component	Affected Land Parcel in Acres	Affected Land Parcel in Ha	Total Compensation Cost (Inclusive of Disturbance Allowance (KES)
Dam area	64.2451	25.9996	73,881,888
Tank 1,3,4	0.997	0.4035	1,819,341
Pump station 1 & 2	3.5533	1.4380	8,494,996
WWTP	104.3822	42.2429	240,079,160
Access Road	3.053	1.2355	5,266,467
Trunk Line	9.9235	4.0160	36,069,902
<b>Total</b>	<b>186.1541</b>	<b>75.3355</b>	<b>365,611,755</b>

Table 6-2: Summary of total valuation costs

	ASSETS CATEGORY	MARKET VALUE (KSHS)	ADD 15% DISTURBANCE ALLOWANCE (KSHS)	TOTAL VALUE (KSHS)
1	Land (186.15 Acres)	317,923,265.00	47,688,490.00	365,611,755.00
2	10% Contingency Sum			36,561,175.52
	<b>GRAND TOTAL</b>			<b>402,172,931.00</b>



## 7 CHAPTER SEVEN: COMPENSATION AND RESETTLEMENT STRATEGY

### 7.1 Introduction

The Kenya Constitution 2010 allows the government and local governments to acquire land for the purpose of community betterment or the public interest. The assessment for compensation under this RAP is, therefore, statutory and all steps have been taken to comply with the statutory provisions.

This is also in relation to the AfDB OS 2 procedures that spell out who is entitled to resettlement compensation as a result of involuntary displacement due to development projects. AfDB Policy is clear that both economic and social considerations should be taken into account when determining the requirement for compensation. Categorisation under the Policy is shown in the table below:

Table 7-1: Eligibility Criteria for Entitlement

No	Category of PAP	Entitlement
1	Displaced population having legal rights to land and assets	Full compensation for loss of land and assets
2	Displacement of population who can prove entitlement under country's customary laws	
3	Displaced persons with no recognized legal rights or claim to the land occupied	Resettlement assistance in lieu of compensation for land
4	All adversely affected population including indigenous groups, ethnic, religious, linguistic minorities, and pastoralists who may have rights to the land or other resources affected by the Project	Land, housing and infrastructure so long as it is not a contradiction to the borrower's legislation

### 7.2 Compensation Principles

The compensation principles to be followed are derived from the national legislation and the financiers guidelines on involuntary resettlement. These principles, including the valuation procedures, were all explained to the PAPs and other community members during the community dialogues and stakeholder consultations

- Resettlement and compensation of PAPs will be carried out in compliance with relevant Kenyan laws and financier standards.
- All PAPs physically or economically impacted shall be adequately, promptly and equitably compensated before the commencement of works at the project-affected sites. All efforts will be taken to provide necessary assistance for PAPs to restore their livelihoods.
- The Project will consider a 15 per cent disturbance allowance as stipulated in the Kenyan law in addition to the assessed compensation values for affected property.
- In consideration of the differences between national legislation and the financiers on Involuntary Resettlement, the higher of the two standards will be followed, where it best applies in this RAP, since this approach also satisfies the requirements of the lesser standard.



### 7.3 Eligibility for Compensation

Eligibility in this report is used in the context of the person that is entitled to or qualifies for any of the following provisions: compensation, resettlement, and rehabilitation assistance. Under this report, a person is determined amongst those that have qualified for any of the identified provisions when s/he meets in full the following conditions:

- a) Part or whole parcels of his or her land is tagged for compulsorily acquisition for the effective implementation of the Project;
- b) S/he occupied this land earmarked for project activities, prior to the cut-off date – i.e. the date recommended for the census.
  - The entitlement ‘cut-off’ date refers to the time when the census and assessment of PAPs and their property in the project area were carried out and ended. This was explained to the community members and PAPs during community dialogues and the PAP census. Thereafter, no new cases will be entertained for compensation.
- c) His or her rights or claim to the tagged land falls into any of the following categories:
  - Formal legal rights to land as recognised by the national and customary Laws of Kenya. Persons considered here are those that hold leasehold land, freehold land and, land held within the family or passed on through generations.
  - No formal legal rights to the land or assets at the time the census begins, but has recognised claim of use of such land or ownership of assets through the national and customary Laws of Kenya. Persons taken into account here are those that come from outside the country and have been given land by the local dignitaries to settle, and or to occupy.

No recognisable legal rights or claim to the land s/he is occupying, using or getting his or her livelihood from. Persons allowed under this considered here include encroachers and illegal.

#### 7.3.1 Cut-off date

The entitlement ‘cut-off’ date refers to the time when the census and assessment of PAPs and their property in the project area were carried out and ended. Since the census survey done by the Consultant is purely for budgeting purposes, no cut-off date was set.

However, during the actual acquisition that will be undertaken by National Land Commission (NLC), a cut-off date will be established and gazetted.

#### 7.3.2 Cash Compensation

This is the main strategy for property and income restoration where loss of land will be the main impact. This strategy will be through adequate and prompt monetary compensation and will apply to all the PAPs. This strategy will include cash compensation for land to enable PAPs to restore their livelihoods.



Table 7-2:Entitlement Matrix

#	Type of Loss	Unit of Entitlement persons	Entitlements
• <b>A. Loss of Residential/ Land</b>			
1	Partial loss of land but residual is viable	(a)Titleholder	<ul style="list-style-type: none"> <li>• 100% Cash compensation for loss at replacement cost</li> <li>• 15% cash top up in compulsory acquisition</li> <li>• Cash compensation for standing assets</li> <li>• Administrative charges, title fees, or other legal transaction costs</li> <li>• Money Management training</li> </ul>
		(b)Tenant	<ul style="list-style-type: none"> <li>• Cash compensation for standing assets</li> <li>• Administrative charges or other legal transaction costs</li> </ul>
		(c) Lease holder	<ul style="list-style-type: none"> <li>• One-month notice to vacate</li> <li>• Money Management training</li> </ul>
		d) Informal Settlers	<ul style="list-style-type: none"> <li>• Cash compensation for standing assets</li> <li>• One-month notice to vacate</li> <li>• Money Management training</li> </ul>
2	Entire loss of land or partial loss where residual is not viable	(a)owners	<ul style="list-style-type: none"> <li>• 100% Cash compensation for entire land holding at replacement cost</li> <li>• Replacement cost for standing assets erected by the Land Owner</li> <li>• 15% cash top-up in compulsory acquisition</li> <li>• Administrative charges, title fees, or other legal transaction costs</li> <li>• Money Management training</li> </ul>
		(b)Tenant (either residential or business)	<ul style="list-style-type: none"> <li>• Replacement cost for standing assets</li> <li>• Administrative charges or other legal transaction costs for registered leases</li> </ul>
		(c)Lease holders	<ul style="list-style-type: none"> <li>• One-month notice to vacate</li> <li>• Money Management training</li> <li>• Relocation assistance</li> </ul>

#### 7.4 Public Disclosure

PAPs will be given an opportunity to review the census survey and valuation results as well as the compensation policies through a binding disclosure prior to actual compensation.

#### 7.5 Livelihood Improvement Program

The aim of the livelihood restoration program in RAP is to enable PAPs to fully restore their livelihoods and improve living standards through capacity building for more profitable and



sustainable use of livelihood assets through capacity building for the establishment of alternative sources of livelihood.

Consultations between the Consultant and the community within the project area proposed the following livelihood improvement projects that can be implemented as part of Corporate Social Responsibility.

- Construction of a secondary school
- Construction of hospital or a dispensary
- Tarmacking or improvement of existing roads
- **Financial Training for Sustainable Use of Cash Compensation**

This is an important aspect of the livelihood restoration program to ensure that the Project does not live the affected worse off. Although cash compensation seemed to be the most preferred, experience has shown that it could be detrimental to the household members particularly female and children. The Project provides for measures to support sustainable use of cash compensation and for mechanisms within the overall monitoring framework to follow up the use of cash compensation. Proposed financial training for affected households that receive cash compensation will focus on:

- Assistance for opening and management of a bank account;
- Financial planning for the household;
- Planning of investments related to the household's participation in livelihood restoration programs;
- Saving strategy;
- Management of existing debts;
- Households will be required to enrol for this training when they sign off the compensation agreement. Both spouses/all partners shall participate in the training. Training will start in advance to the disbursement of compensation and be continued for a period of 1 year. The management of cash compensation will be integrated into the overall monitoring program.





## 8 CHAPTER EIGHT: GRIEVANCE REDRESS MECHANISM

### 8.1 Introduction

Grievances are any complaints or suggestions from the project affected persons about the way a project is being implemented. Grievances and complaints could arise with regards to land expropriation, resettlement, activities associated with the construction project activities, social issues or any other subject related to the project. For effective implementation of the project, grievances and complaints should be redressed throughout the lifetime of the project. The Grievance system will be applied across the various project components. It is important that the grievance committee is fully accessible to all PAPs with grievances. In addition to establishing formal procedures, grievance mechanisms should also work through existing traditional processes.

### 8.2 Grievances Procedure

In line with IFC requirements, the Grievance management provides for three tiers of amicable review and settlement, with the first tier at the site level, second level will integrate a mediation committee in case the grievance cannot be solved at first level and finally there will be an option for each of the complaint to resolve to the court of law (third level) in case there is no resolution of the grievance with the mechanism.

The first tier will comprise of a Grievance Redress Committee whose members include:

- Project Ad-Hoc committee (PAP's representatives)
- Village elder
- Chiefs and Assistant Chiefs
- A representative of groups e.g. the religious groups, business groups, youth and women groups
- TAWWDA representative
- Contractor representative
- Supervising engineer representative

The second tier involves a Mediation Committee whose members will include representatives from:

- Project Ad-Hoc Committee (PAP's representatives)
- National Government representative
- County Government representative
- TAWWDA representative
- Contractor representative
- Deputy County Commissioner/Assistant County Commissioner

### 8.3 Grievance Mechanism

A PAP will report a complaint at the grievance desk that will be set up at the Contractor's office. The Contractor's sociologist/grievance officer will record the complaint in the grievance record and the Grievance Redress Committee will investigate and evaluate the nature of the



complaint and provide a solution to the PAP within 14 days. The Contractor's sociologist/grievance officer will communicate the solution to the PAP agree on a timeframe for implementing the corrective action.

If the Grievance Redress Committee cannot find an amicable solution, the matter is raised to the Mediation Committee for resolution. Additionally, if the PAP is dissatisfied with the solution provided, they can present the grievance to the Mediation Committee who will be expected to provide a solution within 14 days. The Contractor's sociologist/grievance officer will communicate the solution to the PAP agree on a timeframe for implementing the corrective action. A Written agreement to proceed with the corrective action will be sought from the complainant and once the corrective measure is implemented, the complainant will sign the grievance log as a means of verification.

If the PAP remains dissatisfied with the solution provided, they are free to implement the third tier of Grievance Redress, which is filing a case at the court of law.

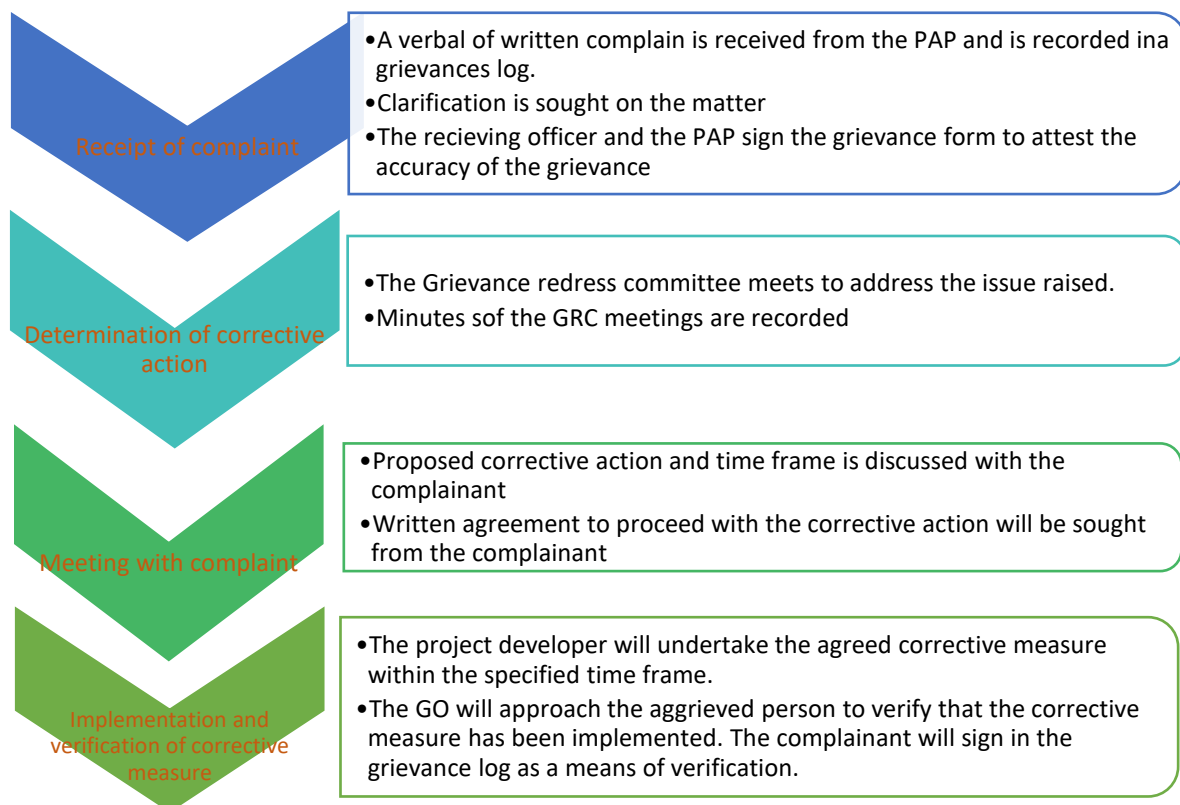


Figure 8-1: Summary of the proposed Grievance Redress Mechanism

The filing of grievances for accurate record keeping is important. The complainant if not able to write the complaint can be assisted by a local leader (preferably who is also a member of the Committee) to the complaints office to file the complaint that thereafter is entered into the register. Once a complaint is received at the complaints desk in the project office, it is registered and given a reference number for ease of following up. The Office will evaluate the application and determine whether the issue can be handled administratively or the Committee has to meet over the matter.

Where the Committee has to be convened, all its proceedings are recorded and minutes prepared of the deliberations. The minutes have to be confirmed at the next meetings and authenticated by the full sitting. All the signed minutes and the resolutions of the GRC are implemented as agreed and without delay so as not to impact negatively on the project implementation plan. Some issues that arise in-course of the project implementation are dealt with as they arise.

#### **8.4 Role of Grievance Redress Committee**

The main function of the Grievance Redress Committee is to provide a forum for the PAPs to air their dissatisfaction arising from the compensation or implementation process of the project. This is an informal forum within the Resettlement Committee to fast-track addressing of emerging issues in a project that can derail a smooth implementation of a project.

- The Committee is to receive complaints from the PAPs through the project office either verbally or in writing and they endeavour to address the issue to the satisfaction of the complainant.
- The Redress Committee will compile registers of all complaints received from the PAPs at the Contractor's office, the actions taken and the decisions arrived at.

#### **8.5 Role of PAP's Representatives in Grievance Redress Committee**

The PAPs officials headed by a Chairman elected by the PAPs shall carry out the following responsibilities as regards redressing grievances: -

- (i) Hear the grievances of the PAPs and provide an early solution to those they are able to;
- (ii) Immediately bring any serious matters to the attention of the Grievance Redress Committee; and
- (iii) Assist in informing the aggrieved parties about the progress of their grievances and the decisions made by the Grievance Redress Committee.

## 9 CHAPTER NINE: RAP IMPLEMENTATION

### 9.1 RAP Implementation Principles

The main objective of resettlement and compensation is to ensure that the PAPs receive due diligence fairly and promptly in regards to compensation. In this way it is expected that their income, production capacity and standard of living will be improved, or at least restored to their former levels. The guiding principles for the implementation of the RAP will be as follows:

- (a) Resettlement or relocation has been minimised by taking into consideration all possible alternative measures;
- (b) Compensation will be paid before project works start in a specific project area and in a manner that does not curtail the livelihoods of the PAPs in terms of access and utilisation of such compensation;
- (c) The compensation values awarded will be fair enough to restore the livelihoods of PAPs;
- (d) The compensation awards will be paid out according to the preference of the PAPs;
- (e) A statutory disturbance allowance of 15 per cent of the compensation value will also be included;
- (f) All other activities related to the RAP will be communicated in advance to the PAPs using the preferred channels of communication;
- (g) Where grievances arise, the respective PAPs will be given an opportunity to be heard, fairly and promptly;
- (h) Measures will be taken to ensure that vulnerable groups get special assistance and support; and where spousal and children consent is needed, the provision will be enforced.

### 9.2 RAP Implementation Arrangements

#### 9.2.1 Rap Implementation Unit

All PAPs will be compensated before clearance for construction commences -implying that compensation will be paid before project works start at a specific site/in a specific area as per the contractor's work schedule.

Client will be the lead agency in the RAP implementation and will work together with the County and National Governments in the PA to implement the RAP. TAWWDA will establish a RAP Implementation Unit (RIU), to implement this RAP. Therefore, it will bear the responsible for ensuring that PAPs promptly access their compensation entitlements and that their livelihoods are restored/improved after resettlement.

The RAP implementation team will be responsible for:

- (i) Delivery of the RAP compensation and rehabilitation measures;
- (ii) Appropriate coordination between the agencies and jurisdictions involved in the RAP implementation; and
- (iii) The measures (including technical assistance) needed to strengthen the implementing agencies' capacities for managing the facilities and services provided under the project.



### 9.2.2 Rap Implementation Unit Structure

The RIU will comprise a core unit responsible for day-to-day operations and technical support staff. The composition of the core unit will be as follows:

- a) An implementation team that will have the following members of staff:
  - Implementation Manager (1); TAWWDA Technical Manager
  - Implementation Officer (1); TAWWDA Social Specialist
  - Monitoring Officer (1); TAWWDA M&E Specialist
  - Administrators (3); one of the administrators can be the designate Grievance Officer.
- b) Valuer (1);
- c) Independent civil society organization/ NGO representative (1);
- d) National Government Representatives (Chiefs)
- e) County Government Representatives (CECM).
- f) Representatives of PAPs in the affected sites
- g) National Land Commission

The day-to-day role of the RAP implementation team will be to:

- a) Plan and coordinate prompt compensation payments;
- b) Plan and coordinate non- compensation issues such as special assistance to vulnerable groups;
- c) Ensure that the compensation process and entitlements adhere to legal provisions such as spousal and children's consent where it applies, and following the succession Act in case of the death of a PAP;
- d) Report to the TAWWDA senior management team and stakeholders;
- e) Ensure that the information needs of the PAPs are disseminated promptly and effectively;
- f) Establish, manage and update the RAP implementation database;
- g) Contribute to the regular monitoring and evaluation of the RAP implementation; and
- h) Consult and sensitize sensitise the community and PAPs with regard to the RAP implementation progress.

### 9.3 Payment Procedure

Payment of compensation will be guided by The National Lands Commission (NLC) under the NLC Act 2012. All compensation payments will be made through designated bank accounts of PAPs. PAPs without bank accounts will be assisted to open up bank accounts. Payment of compensation will follow the prescribed procedure outlined in the NLC Act.

### 9.4 Schedule of Implementation

The relevant stakeholders i.e. Client RAP implementation team and NLC will develop the schedule for the implementation of activities. The implementation schedule will include:

- (a) target dates for the start and completion of compensation payments;
- (b) timetables for and the place of compensation payments;
- (c) target dates for fulfilling the prerequisites for compensation payments and other legal requirements by PAPs;



- (d) the time table for special assistance to vulnerable groups;
- (e) dates for vacant possession of the acquired land from the PAPs (this date must be after the payment of all compensation); and
- (f) The link between the RAP activities to the implementation of the overall sub-project components.

## 9.5 RAP Budget

The budget for implementation of RAP comprises of the cost of acquiring land and the estimated cost of forest material (i.e. trees that will be harvested to allow for construction of the dam, WTP, raw water main). The estimated RAP budget for all components is summarised in Table 9-1. Table 9-2 and 9-3 provide the separate RAP budgets for Dam & Water Transmission and the Sewerage System respectively.

Table 9-1: Estimated RAP Budget for all Components (Dam, Water Transmission & Sewerage System)

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition + forest material	402,172,931
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>402,482,931</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	40,248,293
	<b>Total Cost 2</b>	<b>442,731,224</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	55,341,403
	<b>GRAND TOTAL</b>	<b>498,072,627</b>

Table 9-2: Estimated RAP Budget for Dam & Water Transmission

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition	149,437,283
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>149,747,283</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	14,974,728
	<b>Total Cost 2</b>	<b>164,722,012</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	20,590,251
	<b>GRAND TOTAL</b>	<b>185,312,263</b>





Table 9-3: Estimated RAP Budget for Sewerage System

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition	281,415,530
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>281,725,530</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	28,172,553
	<b>Total Cost 2</b>	<b>309,898,083</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	38,737,260
	<b>GRAND TOTAL</b>	<b>348,635,343</b>

\*The cost will also include a 10 per cent each for administration cost for the RAP implementation, which included the cost of conveyance, financial management training and monitoring and evaluation.



## 10 CHAPTER TEN: MONITORING, EVALUATION SYSTEM AND COMPLETION AUDIT

### 10.1 General Objectives of M&E

The purpose of monitoring and evaluation is to report on the effectiveness of the implementation of the RAP, and the outcomes and impact of compensation on the PAPs in relation to the purpose and goals of the RAP. This section describes the Monitoring and Evaluation (M&E) system for the RAP and also describes the parameters and associated indicators to be monitored, and the monitoring milestones and resources, including the persons or institutions responsible for carrying out the monitoring activities. Monitoring Officer will be part of the RAP implementation team.

The general objective of the M&E system is to provide a basis for assessing the overall success and effectiveness of the implementation of the resettlement and compensation processes and measures. A number of objectively verifiable indicators (OVIs) will be used to monitor the impacts of the compensation and resettlement activities. These indicators will be targeted at quantitatively measuring the physical and socio-economic status of the PAPs, to determine and guide improvement in their social wellbeing. The following parameters will be used to guide the measurement of the RAP performance:

- (a) Each PAP will have a digitised compensation file/record indicating his/her background situation before RAP, the compensation agreed upon and received, the impacts on land and property, the use of assets/improvements after RAP etc. This data will be entered into a database for comparative analysis at all levels;
- (b) The mode of compensation preferred by PAPs and used by the RIU;
- (c) The use of compensation payments and other resettlement assistance by PAPs;
- (d) The grievance handling outputs and outcomes for respective PAPs;
- (e) The number of grievances and the time and quality of resolution;
- (f) PAP's ability to re-establish their livelihood activities and property, including alternative incomes; and
- (g) New livelihood activities established and the productivity of such livelihoods at household and community levels;

The M&E will be undertaken at two levels:

- (i) **Internal monitoring:** This will be undertaken regularly by the RIU/Monitoring Officer; and,
- (ii) **External evaluations** (or end of time of RAP implementation): Evaluation will be undertaken by an independent consulting firm hired by TAWWDA. Evaluation will be necessary in order to ascertain whether the livelihood and income restoration goals and objectives have been realised.

### 10.2 Monitoring the Compensation Process

#### (a) Internal Monitoring Issues

The effectiveness of the RAP implementation process and activities will be monitored through internal monitoring. This will be undertaken by the client's Monitoring Officer and will involve monitoring of the compensation process and activities to ensure that effectiveness is achieved throughout the RAP implementation



Internal monitoring will be thematically carried out at two process levels; during the resettlement compensation payment period and after that period (post-compensation payment period). Each process/thematic period will have different monitoring issues which the M&E officer should pay attention to, as summarized in **Table 10-1** below.

*Table 10-1: Monitoring Thematic Issues during and after Compensation Payments*

Thematic periods	
Resettlement compensation payment period	Post-resettlement compensation payment period
<ol style="list-style-type: none"> <li>1. Number of PAPs compensated</li> <li>2. Number of PAPs who have acquired legal papers to new property</li> <li>3. Number of PAPs who have registered grievances with the GO</li> <li>4. Number of PAPs whose grievances have been resolved</li> <li>5. Number of vulnerable PAPs or groups identified and assisted during compensation payments</li> </ol>	<ol style="list-style-type: none"> <li>1. Number of PAPs with successfully restored livelihoods and assets,</li> <li>2. Number of PAPs who have maintained social and cultural ties,</li> <li>3. No of PAPs whose grievances have been resolved or otherwise,</li> <li>4. Number of vulnerable groups assisted and restored livelihood enterprise and assets.</li> </ol>

### (b) Roles and Responsibilities

The roles and responsibilities of the Monitoring Officer must be seen to directly contribute to the objectives of the internal monitoring process. The roles and responsibilities will involve:

- (i) Setting up a system to collect, on a monthly basis, basic demographic and livelihood data about PAPs and having this data entered into a database for M&E;
- (ii) The identification and improvement of indicators to measure the RAP performance;
- (iii) The measurement of indicators at appropriate intervals;
- (iv) Collecting and analyzing data against pre-compensation baseline information to be able to track and isolate changes in the livelihoods of the PAPs;
- (v) Setting up a system to enable the RIU to use M&E findings to improve or modify existing implementation measures or processes;
- (vi) Maintain in good order and regularly updating the M&E database;
- (vii) Receiving information from other officers in the RIU, from the general community, from technical and political officers from sub-counties;
- (viii) Giving feedback to other officers in the RIU, stakeholders and representatives through monthly reports and disseminations;
- (ix) Training and supervising locally recruited enumerators to collect data from the PAPs; and



- (x) Undertaking specialized assessment for vulnerable PAPs and suggesting necessary interventions for such groups.

**(c) Monitoring Indicators**

The relevant monitoring indicators against which to measure the RAP implementation effectiveness are presented in **Table 10-2** below. A monitoring form will be used for this purpose.

*Table 10-2: Proposed Monitoring Indicators*

Activity/Parameters	Indicators
Compensation payments to PAPs	Number of PAPs promptly paid Number of PAPs not paid promptly and reasons Amounts of money paid to PAPs
Community participation and public engagement	Number of local consultative meetings held Number of County and National Government leaders engaged/briefed about the RAP Number of Civil Society representatives engaged/briefed about the RAP Number of PAPs consultative meetings held
Grievance management	Number of grievances received Number of grievances resolved promptly (in allowed time) Number of grievances not resolved in time but completed Number of outstanding grievances not resolved Number of grievances referred Nature of outcomes from referred grievances
Mutation and registration of land rights	Number of mutation forms signed by PAPs Number of land titles received Number of land titles processed and returned to owners Number of land titles not processed and why Number or percentage of encumbrances entered on PAPs titles



### 10.3 External evaluation

TAWWDA will initiate the process of external evaluation collaboration with other national stakeholders. To avoid conflict of interest, the external evaluation will be undertaken by an external evaluation agency. The external evaluation will also be thematically undertaken at two levels and will examine the RAP implementation effectiveness and outcomes as outlined in **Table 10-3**.

*Table 10-3: External Evaluation Thematic Issues*

Thematic Issues	
Process indicators that measure the effectiveness of the RAP implementation process	Outcome indicators (the main design of outcome evaluation will be a pre- and post-compensation comparative analysis)
<ol style="list-style-type: none"> <li>1. Adequacy (of staff number/skills/knowledge levels; equipment and facilities) at RIU</li> <li>2. Legislative compliance with national and AfDB OS 2 standards</li> <li>3. Outputs of the M&amp;E, compensation payments, community engagement, reporting, grievance processes as indicators of effectiveness and adequacy</li> <li>4. Collaboration and coordination adequacy of the RIU</li> </ol>	Livelihood changes among PAP households, including production systems and the standard of living and welfare

### 10.4 RAP Completion Report

TAWWDA will at the end of the RAP implementation submit a final report to the project financiers. The final report will indicate the effectiveness of the RAP implementation process, including: the organisation and delivery of compensation payments and other resettlement measures; the grievance handling system; the M&E system; the community and public engagement, including vulnerable groups; and the socio-economic impacts of the resettlement measures. The final report will give an overall assessment of the RAP outputs against inputs indicating the planned activities completed and not completed as well as the lessons learnt during the RAP implementation.

### 10.5 Completion Audit

The completion audit is intended to verify the results of the RAP implementation indicators, and to assess whether the RAP implementation achieved the resettlement objectives. A specific question for the final audit is whether livelihood and living standards have been restored or enhanced. If the answer is positive, then the RAP implementation will be considered to be completed. The RPF notes that the audit will also assess the efficiency, effectiveness, impact and sustainability of the RAP sub-project activities and document the lessons learnt for application to future sub-projects or other projects in the sector and in the country. Finally, the



completion audit will ascertain whether the resettlement entitlements were appropriate, TAWWDA will submit the completion audit report to the Project Financiers for review and appropriate action. The client will be responsible for sourcing of and assigning to competent firm(s) the undertaking of the completion audit.





## **11 References**

Sessional Paper No. 3 of 2009 on National Land Policy (referred to as the “National Land Policy” in this report) was adopted in August 2009 by the Ministry of Lands. Available at

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## **12 Appendix**

### **12.1 Attendance List and Minutes of meetings**

## **12.2 Letters of Invitation to meeting**

### **12.3 Questionnaire used during Household Survey**

## **Annex**

### **Valuation Report**



## TANATHI WATER WORKS DEVELOPMENT AGENCY

### CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECT

CONTRACT NO. TAWWDA/028/2020-2021



## Valuation Report

May 2023

**Runji Consulting Group**   
Engineering & Project Management  
P.O Box 68053-00200  
Nairobi, Kenya



Internal Quality Control

Revision	Purpose description	Originated	Checked	Reviewed	Authorized	Date
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## Definition of Terms:

### a) Market Value:

The market value (MV) means the best price at which the sale of an interest in property might reasonably be expected to have been completed unconditionally for cash consideration on the date of valuation assuming; -

- a willing seller;
- That, prior to the date of valuation, there had been a reasonable period (having regard to the nature of the property and the state of the market) for the proper marketing of the interest, for the agreement of price and terms and for the completion of the sale;
- That the state of the market, level of values and other circumstances were on any earlier assumed date of exchange of contracts, the same as on the date of valuation; and
- That no account is taken of any additional bid by a purchaser with a special interest.

The market value reflects continuation of the existing use and the value may include a special element attributable to the earning potential of the premises for a particular existing purpose by reason of their nature, location, character and physical construction but such element of value, if present, exists irrespective of the benefit for the property to the particular individual undertaking of which it forms a part.

### b) Disturbance Allowance:

This refers to the amount of statutory compensation equal to fifteen per cent (15%) of the market value (Value of land and improvements only) as a way of compensation for disturbance.

The idea is to put the owner in a position to reinstate himself on other land so as to be able to carry on his activities unaltered and undiminished (equivalent reinstatement).

The Land Act No.6 of 2012 gave the National Land Commission to make rules to regulate the assessment of just compensation.

The Land (Assessment of Just Compensation) Rules 2017 provides that the Commission shall add a sum equal to fifteen per cent of the market value to the amount of compensation as compensation for disturbance.

# 1 INTRODUCTION

## 1.1 Background Information

Tanathi Water Works Development Agency (TAWWDA), an implementing agency has received funding from The Ministry of Water & Sanitation and Irrigation (MoWSI) for the Detailed Studies and Design of Namanga Dam Water Supply and Sanitation Project. This mission is in line with requirement of Vision 2030 and is aimed at augmenting water supply and sanitation services to meet the current and futuristic water supply and sanitation demands for Namanga Town and neighbouring urban centres.

TAWWDA is the legal Agency mandated with construction of water works within Machakos, Kitui, Makueni and Kajiado counties. Prior to 3rd May 2019, TAWWDA was known as Tanathi Water Service Board (TAWSB). The Agency is mandated to undertake the development, maintenance, and management of National public water works within the area of jurisdiction. It is also mandated to operate the water works and provide water services as a water provider, until such a time as a responsibility for the operation and management of the waterworks are handed over to a County Government. The Agency provide technical services and capacity building to such County Governments and water services providers within its areas as may be requested and provide to the Cabinet Secretary technical support in the discharge of his or her functions under the Constitution of Kenya and the Water Act 2016.

In the present study assignment, TAWWDA has contracted Ms. Runji Consulting Group Ltd to undertake the Detailed Design of Namanga Dam Water Supply and Sanitation Project. The Consultant commenced the studies on 25<sup>th</sup> May 2021. The conclusion of the assignment will be marked by the finalisation of design reports, tender documents, ESIA report and RAP report for the Project. It is in this regard that this Valuation Report has been prepared for purposes of budgeting for the compensation values that will be accorded to the Project Affected Persons whose land will be acquired in order to implement the project.

Prior to the present assignment, the Agency engaged Ms Seven Seas Consultants Limited for the Feasibility Studies and Preliminary Designs, cost estimates and tender documentation of the Project. The studies concluded in June 2020, recommended further investigations on construction of Namanga Dam, water treatment plant, water distribution to serve Namanga Town and Maili Tisa Town Centre.

## 1.2 Project Description

The proposed dam is to supply water to Namanga Town, Maili Tisa Centre, Ngataek Centre, Bisil Town and all the settlements between these towns. Sewerage works coverage is limited to Namanga Town.

The Project study has two main components of water supply and sanitation.

- Water supply study aims at augmentation of the existing system. The key components of the existing system include river intake works, chlorination of the river water, boreholes, ground and elevated storage tanks, limited water pipe network and limited individual connections. The existing water sources (Oldonyo Orok Springs/Stream, boreholes) have a measured capacity of 770m<sup>3</sup>/day and a design capacity of 1,178m<sup>3</sup>/day during wet season. The existing system for the town is challenged by limited pipe distribution
- There is no existing off-site waste water treatment facility for the project area. This study aims at developing plans for new waste water collection and treatment system

### 1.3 Terms of Reference

We received instructions from **Runji Consulting Group Limited, of P.O Box 68053-00200, Nairobi**, to carry out valuation for the assets (land, structures, trees & crops) to be affected by the Proposed Namanga Dam Water Supply and Sanitation Project and prepare a valuation report for **budgeting and compensation purposes**.

We therefore present our valuation as follows: -

- Market Value of the affected land
- In addition to: Disturbance Allowance @ 15% of the above totals.

### 1.4 An Overview of Resettlement Action Plan (Rap)

The Resettlement Action Plan (RAP) Study is an important exercise for any institution that wants to develop facilities where there are human activities. Preparation of a RAP is hinged on a Resettlement Policy Framework (RPF). RPF is a statement of policy, procedures, principles, institutional arrangements that guides and governs how to resolve issues arising from displacement. The RPF provides guidelines on how to avoid, manage or mitigate potential risks arising from the envisaged project. Based on the RPF, a detailed Resettlement Action Plan (RAP) is then prepared for each individual project within the RPF framework.

RAP is guided by the National Legal framework on entitlements for displaced populations as well as international good practices on involuntary resettlements. The preparation of the RAP is guided by the relevant legal policy framework in Kenya (Kenya Constitution 2010, the Land Act 2012) and the international good practices (World Bank OP.4.12, Japan International Cooperation Agency (JAICA) Guidelines, 2010 and the African Development Bank (AfDB) Guidelines on involuntary resettlement.

An important aspect of preparing a RAP is to establish appropriate socio-economic baseline data to identify persons who are likely to be affected by the implementation of the proposed development project. Such an action will require consultation and participation of the would-be affected persons and communities, in decision-making processes related to resettlement. A



RAP should address potential adverse impacts of the project and at the same time make provisions for improving the socio-economic conditions of the populations affected by the project (PAPs).

Therefore, to achieve the objectives of RAP, a mix of professionals is required, key among them being; Land Surveyor, Sociologist and Land Economist (Valuer). Others would be Public Finance Expert and Physical Planner. We note that the expertise of Land Surveyor and Public Finance are missing in your RFP but we recommend their inclusion in the lead team. We have included them in our technical proposal. A Land Surveyor is vital to carry out cadastral survey and determine the acreage of individual parcels of land for each Project Affected Person (PAP), especially where the affected parcels have not been adjudicated/registered, and produce settlement plans. This data is key in estimating the compensations for each PAP. On the other hand, a public finance expert would advise on costs and budgets of the RAP and educate the PAPs on the Income Restoration strategies.

### **1.5 Purpose of the Valuation report**

The objective of this valuation report is to come up with value estimates for land, structures, trees and/or crops which will then provide a strategy for resettlement compensation to ensure that PAPs livelihoods are restored and/or improved

## **2 PROCESS OF COMPULSORY LAND ACQUISITION IN KENYA**

Previously, compulsory land acquisition in Kenya was governed by Land Acquisition Act Cap 295 before it was repealed and replaced with Land Act No.6 of 2012.

Under the Land Act, 2012 Part VII, the process of compulsory land acquisition can be summarized as follows: -

### **2.1 Proof that acquisition is for public good**

Whenever the national or county government is satisfied that it may be necessary to acquire some particular land under section 110 of Land Act 2012, the acquisition of the land must be necessary for public purpose or public interest, such as, in the interests of public defence, public safety, public order, public morality, public health, urban and planning, or the development or utilization of any property in such manner as to promote the public benefit. The act state that respective Cabinet Secretary or the County Executive Committee Member shall submit a request for acquisition of public land to the NLC to acquire the land on its behalf.

### **2.2 Publication of notice of intention to acquire**

Upon approval, the Act provide that NLC shall publish a notice of intention to acquire the land in the Kenya Gazette and County Gazette and serve a copy of the notice to every person interested in the land and deposit the same copy to the respective Lands Registrar. The notice is expected to include the description of the land, indicate the public purpose for which the land is being acquired and state the name of the acquiring public body. According to the act, any interested person shall include any person whose interests appear in the land registry and the spouse or spouses of such person as well as any person actually occupying the land and the spouse or spouses of such person. The Lands Registrar shall then make entry in the master register on the intention to acquire and the land shall be geo-referenced and authenticated by the survey office at both national and county level.

### **2.3 Inspection of the Land to be acquired**

NLC may authorize in writing any person to enter the land specified in the notice to ascertain or satisfy whether the intended land is suitable for the public purpose which the applying authority intends to use as specified. However, the authorization shall not empower the person to enter a building, an enclosed court or garden attached to a dwelling house without the permission from the occupier or having served a written notice to the occupier on intention to enter in not less than seven days before entry. As soon as possible, NLC shall promptly pay in full, just compensation for any damages resulting from entry.

## **2.4 Notice of inquiry**

Thirty days after the publication of the Notice of Intention to Acquire, the NLC then schedules a hearing for public inquiry. NLC must publish notice of this hearing in the Kenya Gazette and County gazette 15 days before the inquiry meeting and serve the notice on every person interested in the land to be acquired. Such notice must instruct those interested in the land to deliver to the NLC, no later than the date of the inquiry, a written claim for compensation.

## **2.5 Public Hearing/Inquiry**

At least 30 days after publication of the Notice of Intention to Acquire the Commission shall appoint a date for an inquiry to hear issues of propriety and claims for compensation by persons interested in the land. At the hearing the NLC must conduct a full inquiry to determine the number of individuals who have legitimate claims on the land and receive written claim of compensation from those with interest in the land. For the purposes of this inquiry, the Commission shall have all the powers of the Court to summon and examine witnesses, including the persons interested in the land, to administer oaths and affirmations and to compel the production and delivery to the NLC of documents of title to the land. The public body for whose purposes the land is being acquired, and every person interested in the land, is entitled to be heard, to produce evidence and to call and to question witnesses at an inquiry. It will also provide opportunity to those interested in the land to hear the justification of the public authority in laying claims to acquire the land

## **2.6 Award of Compensation**

Upon conclusion of the inquiry NLC prepares a written award to each legitimate claimant. The NLC will publish these awards which will be considered “final and conclusive evidence” of the area of the land to be acquired, the value of the land and the amount payable as compensation.

## **2.7 Payment of Compensation**

A notice of award and offer of compensation shall be served to each person by the Commission. Section 120 provides that “first offer compensation shall be paid promptly” to all persons interested in land before a notice of acquisition is issued. Section 119 provides a supplementary condition and states that if the size of land is greater than the size of land in respect of which the award has been made, then NLC shall compensate for excess size “as soon as practicable”. Where such amount is not paid on or before the taking of the land, the NLC must pay interest on the awarded amount at the market rate yearly, calculated from the date the State takes possession until the date of the payment.

In cases of dispute, the Commission may at any time pay the amount of the compensation into a special compensation account held by the Commission, notifying

any persons interested accordingly. If the amount of any compensation awarded is not paid, the Commission shall on or before the taking of possession of the land, open a special account into which the Commission shall pay interest on the amount awarded at the rate prevailing bank rates from the time of taking possession until the time of payment.

## **2.8 Transfer of Possession and Ownership to the State**

Once first offer payment has been awarded, the NLC serves notice to all persons with interest in the property indicating the date the Government will take possession. Upon taking possession of land, the commission shall ensure payment of just compensation in full. When this has been done, NLC removes the ownership of private land from the register of private ownership and the land is vested in the national or county Government as public land free from any encumbrances.

The commission has also the power to obtain temporary occupation of land. However, the commission shall as soon as is practicable, before taking possession, pay full and just compensation to all persons interested in the land.

## **2.9 Urgent Acquisition**

In cases of where there is an urgent necessity for the acquisition of land, and it would be contrary to the public interest for the acquisition to be delayed by following the normal procedures of compulsory acquisition under this Act, the Commission may take possession of uncultivated or pasture or arable land upon the expiration of fifteen days from the date of publication of the notice of intention to acquire, and on the expiration of that time the Commission shall, notwithstanding that no award has been made, take possession of that land in the manner prescribed by subsection (1) of the Act.

Upon taking the land under subsection (1) or (2) the commission serve a notice to the registered owner and the lands registrar that possession of land has been taken and now vests on the County or National Government.

## **2.10 Dispute Resolution**

Any dispute arising from any matter provided under this Act shall be referred to Environment and Land Court. However, Land Value (Amendment) 2019, has reviewed this and provided for Land Acquisition Tribunal as the first jurisdiction to hear any disputing arising from the acquisition with Environment and Land Court exercising appellant jurisdiction.

## **2.11 Valuation Provision**

It should be noted that the Land Act, 2012 does not explicitly provide for a valuation in the process. However, the Land Value (Amendment) Act 2019 which amended the Land Act, valuation is explicitly provided under section 3 which state that if the NLC establishes that the request meets the criteria for compulsory acquisition it shall cause

the affected land to be mapped out and valued by the NLC using the valuation criteria provided in the Act and also establish that the acquiring authority has identified the number and maintains a register of persons in actual occupation of the land, confirming for each such occupation how much time they have been in uninterrupted occupation or ownership of interest in the land prior to the date of the request for acquisition of the land, and the improvements thereon.  
part.

### **3 LAWS RELATING TO COMPULSORY ACQUISITION/INVOLUNTARY RESETTLEMENT IN KENYA**

Kenyan legislations do not use the term involuntary resettlement. Involuntary resettlement refers to two distinct but related processes. The first, displacement, is a process by which development projects cause people to lose land or other assets, or access to resources. This can result in physical dislocation, loss of income or other adverse impacts. The second process, resettlement, or rehabilitation, is a process whereby those adversely affected are assisted in their efforts to improve, or at least restore, their incomes and standards of living.

The legislation related to involuntary resettlement in Kenya include Kenya Constitution (2010), Land Act (2012) and Land Registration Act 2012. These legislations provide for involuntary acquisition or purchase of private land for a public purpose or interest. They also provide for prompt and full compensation for loss of land and other assets to all persons determined to have interest in the land, including occupants in good faith of land acquired who may not hold title to the land.

What the laws do not provide for is resettlement of people displaced as a result of such compulsory acquisition beyond monetary compensation. This is notwithstanding the fact that affected persons may incur much more than they are paid in compensation in order to restore their livelihoods to previous status.

In this context the interpretation of “just compensation in full” may vary from one acquiring entity to another, with others considering the issue of livelihood restoration as an aspect of corporate social responsibility, rather a resettlement need. The Consultants will review the relevant existing legal framework related to RAP, such as the ones highlighted below.

#### **3.1 Kenya Constitution 2010**

The Kenya Constitution (2010) in Article (40) on right to property provides that every person has the right, either individually or in association with others to acquire and own property of any description in any part of Kenya. However, Article 40(3) provides that the State may deprive a person of property of any description if the deprivation is for a public purpose or in the public interest, and that there is “prompt payment in full of just compensation” to the person.

Article 40(4) provides for compensation to be paid to occupants in good faith of land acquired under clause (3) who may not hold title to the land. These provisions of Article (40) have been legislated for in the Land Act of 2012, Land Registration Act of, 2012 and Electricity Power Act of 1997.



### 3.2 Land Act No. 6 of 2012

The Land Act (2012) repealed both the Land Acquisition Act and the Way leaves Act that relate to deprivation of property for a public purpose or in the public interest, and provided for the same under Part VIII on *compulsory acquisition of interest in land* and Part X on *easements and analogous rights*, respectively.

The Land Act vests the procedures for compulsory acquisition of land in the National Land Commission on behalf of an entity requiring land for a public purpose or public interest, and provides under Section 111(1) that if land is acquired compulsorily, "just compensation shall be paid promptly in full to all persons whose interests in the land have been determined".

Section 144(1) of the Act provides for the creation of a way-leave on application to the Commission whether by a State department, county government, public authority or corporate body. The entity applying for way leave shall serve notice to all persons occupying or have interest in the land and the county government in whose area of jurisdiction land over which the proposed way-leave to be created is located.

Sections 146-147 provide for the procedure to be followed by the Commission in the creation of the way leave that involves consultations with the respective county government and the occupants of the land. The agreed way leave should be delineated, published in the Gazette by the Cabinet Secretary for Lands, notified to the county government, and publicized in any manner to bring it to attention of people occupying or using the land along the route of the way leave.

Section 148(1) provides for compensation for a way leave in case of private land to any person in lawful or actual occupation as assessed by a qualified valuer in respect of:

- (i). The use of the land
- (ii). The damage suffered in respect of trees, crops, buildings on the route of the way leave
- (iii). The damage suffered during any preliminary work undertaken in connection with surveying or determining the route of that way leave.

Section 148(5) provides for recourse to Land and Environment Court for a person entitled to compensation for way leave who is dissatisfied with the amount, mode of payment and time taken to make payment. The Court in determining the amount and method of payment may make additional costs and inconvenience incurred by the person entitled to compensation.

### **3.3 Land Registration Act of 2012**

The Land Registration Act (2012) provides for registration of overriding interests in the register for each parcel of land. The overriding interests under Section 28 include among other things rights of way, rights of water, or electric power lines, telephone and telegraph lines or poles, pipelines etc erected, constructed or laid in pursuance or by virtue any power conferred by any written law. It is a requirement that any way leave or ROW acquired be gazetted and submitted to the Land Registrar for entry into the particulars of each parcel of land affected.

### **3.4 Community Land Act, 2016**

Compulsory acquisition of community land is provided for under Part V of the Act. The Act states that subject to the Constitution and the Land Act, no right over community land may be compulsorily acquired by the State except in accordance with the law, for a public purpose and upon prompt payment of just compensation to the person or persons, in full or by negotiated settlement.

### **3.5 The Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act, 2012.**

The provisions of this Act are guided by the Bill of Rights under the Constitution of Kenya 2010. Section 5 of the Act lists development projects among the displacing factors and outlines involvement of the affected persons through awareness, sensitization, training and education on causes, impact, consequences and prevention measures.

Section 6 of the Act provides that displacements and relocation from land required for a development project will only be justified by a compelling and overriding public interest.

Section 22 list procedures to be followed during relocation which include justification as to why the displacement is unavoidable and that there is no other feasible alternative, seeking free and informed consent from the affected persons, holding public hearing on project planning, giving reasonable notice to allow the affected persons review and react to the displacement conditions and that displacement process should reflect respect to human rights.

### **3.6 The Matrimonial Property Act, 2013**

The Act identifies the joint ownership of matrimonial property. Section 4 gives instances when a woman has the same right as a man with regard to property. Despite any other law, a married woman has the same rights as a married man. It provides for the equal status of spouses to acquire, administer, hold, control, use and dispose of property whether movable or immovable, to enter into a contract and to sue and be sued in her own name. This law is relevant because of the shared property rights in polygamous or monogamous families that will be encountered during acquisition.

### 3.7 The Land Value (Amendment) Act 2019

The Act came into force on 16 August 2019 and has amended various sections of the Land Act, the Land Registration Act as well as the Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act. Major provision introduced by the Act can be summarized as follows: -

- **Government to take possession of land before compensation;** Before enactment of this Act, the National Land Commission (NLC) was required to compensate a landowner prior to taking possession of the land. However, the Act now allows the NLC to take possession of the land and pay compensation at a later date within a reasonable amount of time (not later than one year). The Act contravenes the constitution which provide for prompt and just compensation as one year maybe considered too long to be considered prompt.
- **Establishment of the Land Acquisition Tribunal and limiting powers of the court;** The Act has established the Land Acquisition Tribunal which shall hear disputes related to the compulsory land acquisition process and in determining such disputes, confirm, vary or quash the decision of the NLC. Before the enactment of this Act, disputes were referred to Environmental Land Court as the first jurisdiction to hear such a dispute. However, under this Act, the Tribunal is the first jurisdiction to hear such disputes with Environmental Land Court exercising appellate jurisdiction.
- **NLC possession of land;** The Act provides that where the NLC has taken possession of the land, no order stopping any development of the land may be issued by any court if public funds have already been committed to its development.
- **Assessment of Land Values;** The Act provides that valuation of freehold land and community land for purposes of compensation shall be based on the Land Value Index. This is an analytical representation showing the spatial distribution of land values in a given geographical area at a specific time to be developed jointly by the national government and county government. In calculating the Land Value Index, the declared value of the land for purposes of payment of rates, rents or stamp duty shall be taken into account in addition to other factors provided in the Act such as the increase in the value of the land due to improvements made on it. However, an increase in value will be disregarded if the improvements are carried out after the publication of a gazette notice that sets out the government's intention to acquire the land compulsorily.
- **More forms of compensation;** Apart from monetary compensation, the following new forms of compensation have been introduced under the Act:
  - Allocation of an alternative parcel of land of equivalent value and comparable geographical location and land use to the land compulsorily acquired;
  - Issuance of government bond;
  - Grant or transfer of development rights as may be prescribed;

- Equity shares in a government-owned entity; and
- Any other lawful compensation.

## 4 VALUATION METHODOLOGY AND STRATEGY ADOPTED

### 4.1 Comparative Sales Method (Market Comparables Approach Method)

This is the most realistic of all valuation methods. It is based on the comparison of the property to be valued with similar properties and the prices achieved from them, taking account of the differences between them. The comparability of the properties is based on the use of the property, location (characteristics of the neighbourhood), site area, site conditions, physical properties of the building (floor area, building materials used, amenities such as garage, etc.), and income related factors. The data to come up with an estimate market value is normally obtained from local land agents, valuers, government departments, and other sources as necessary. Comparability is usually in respect of property transaction prices and market conditions. Each of these aspects has to be thoroughly analysed before accepting the method. The intention is to compare similar properties. For instance, agricultural land in one county may not be the same in another county, nor can residential property be compared with an industrial property.

This method of valuation is particularly constrained because of the general lack of market transactions. In some instances, property transactions are fairly secretive due to the controlled nature of the property market. Additionally, sales data often become historic due to effects of hyper-inflation making comparable sales analysis difficult.

The land estimate value in our case is based on Market Rate (commercial rate) according to Kenya law for sale of land or property. In terms of land, this may be categorized as follows;

- a. Replacement cost for agricultural land: means the pre- program or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land,
- b. Plus, the costs of preparing the land to levels similar to those of the affected land; and
- c. Any registration and transfer taxes;

### 4.2 Valuation Strategy

The valuation report provides a strategy for resettlement compensation to ensure that the PAPs' livelihoods are restored and/or improved before the land for the planned construction of the *Namanga Water and Sanitation project* is finally acquired. The strategies employed during the valuation of the access road are discussed below.

#### 4.2.1 Valuation of Land

We first established the size of land to be affected and then we used the comparables sales data for recently sold land in the vicinity of the affected land. Comparable sales data was obtained from land sales agent in Namanga, fellow Valuers, chiefs and headmen in areas

affected by the project, Kajiado Lands Registry, among other land dealers. This sales data was then adjusted and used to compute the compensatable amount for the affected land.

#### **4.2.2 Valuation of Houses and Other Structures**

In the valuation of houses and other structures, the following aspects were taken into consideration:

- The market cost of the materials to build a replacement structure with the area and quality similar to or better than those of the affected structure, or to repair a partially affected structure,
- Plus, the cost of transporting building materials to the construction site,
- Plus, the cost of any labour and contractors' fees, plus the cost of any registration and transfer taxes

**NB:** The proposed project does not affect structures hence no value has been assigned to them.

#### **4.2.3 Valuation of Trees and/or Crops**

For valuation of trees and/or crops, we relied on comparable data from various actors involved in compensation where similar projects have been conducted including Kenya Agricultural Research Institute (KARI) now Kenya Livestock and Research Foundation (KALRO), Department of Agriculture in the Ministry of Agriculture, Livestock and Fisheries, Rural Electrification & Renewable Energy Corporation (RE & REC), National Irrigation Authority (NIA), etc. Further, Under Kenya Resettlement Policy Framework 2017, trees and crops are supposed to be compensated using the guidelines from the Ministry of Agriculture and Kenya Forest Service.

**NB:** We did not assess the value of trees for the Kenya Forest Service land since we did not get access to the land. (See appendix 6.4) on letter done to KFS). Further, most of the trees and/or crops along the project corridor are seasonal hence farmers/PAPs can be given adequate time to harvest.

### **4.3 GENERAL REMARKS**

During our valuation fieldwork exercise, we noted some areas of concern which we have captured as comments as follows: -

#### **4.3.1 Sewer Component**

The Registration Section of the parcels to be acquired along the first section of the land near Namanga Town where the pipe is expected to pass reads Kajiado/Meto. This might be explained by the alleged overlapping of the cadastral maps from the County Department of Lands office and needs to be sorted out in the next phase of the project implementation. To this end, we encountered a great challenge around this section since they were not willing to



give their details as the registration details we had differed with what they held as title deeds. Accordingly, we have not apportioned value estimates to individual PAPs and have thus based our compensation value estimates on the total acreage proposed to be acquired along the sewer-line project corridor.

#### **4.3.1.1 Trunk Line**

There is no need of acquisition at the boarder point area because there is an adequate road reserve where the line can pass through until where it exits the main road and joins the earth-road. The earth road also has adequate space for sewer line passage. Upon exiting the earth-road, acquisition now becomes inevitable.

Right before accessing the Waste Water Treatment Plant (WWTP), there is no need of acquiring wayleave within parcels 2077,2078 and 3706. The line can pass through the existing wayleave BUT probably within 3707 (to facilitate a smooth turning which is not a must unless it's a design parameter)

#### **4.3.1.2 Line 1**

The line passes next to the existing Namanga road and it can be fixed along the edge of the road reserve.

#### **4.3.1.3 Line 2**

There is adequate reserve to accommodate the line thus no need for acquisition.

#### **4.3.1.4 Line 3**

To minimize the acquisition, the line can be re-routed to pass through an existing road reserve to the point of the Dead-end then a minimum acquisition can be effected to allow connection to the MTL.

#### **4.3.1.5 Waste Water Treatment Plant (WWTP)**

We visited the PAP (Parcel No.1001) where the WTP will be situated and the land owners was not willing to sell 100 acres, which is his entire piece of land. He indicated that he could only part with about 50acres. Our suggestion is that there is a need for the project proponent to have a meeting with him and the neighbouring land owners to see if they are willing to sell their land parcels for construction of the WWTP.

### **4.3.2 Water Supply Component**

There is an existing 12M road corridor that connects the KFS land and Maili Tisa and therefore the project can be restricted to this road corridor to avoid acquisition.

### **4.3.3 Dam, Water Treatment Plant and Access Roads Component**

The project has designed these components within the Ol Doinyo Orok Forest land. This will minimize the displacement of persons as the forest lies within government land. The Consultant did not manage to undertake an inventory of the affected trees within the forest, but the affected land size has been considered in the valuation. Therefore, we recommend that during the acquisition, KFS to be engaged as they have their system of taking an inventory of the trees and their value assessed if need be. If KFS, which by extension is a government agency, requires compensation for their trees to be affected, the same can be considered under the contingency sum provided for in the RAP Report.

#### **4.3.4 Structures, Trees and/or Crops**

Most of the proposed sewer line corridor affects land parcels that are devoid of any structures. Where there are crops and/or trees to be affected, PAPs can be given ample time to harvest since most of them are seasonal.

## 5 VALUATION OF AFFECTED ASSETS

### 5.1 Asset Inventory

A field survey undertaken between 3<sup>rd</sup> April 2023 -10<sup>th</sup> April 2023 that sought to take an inventory of the affected assets within the project area as per the design, it was found that the major impact is loss of land at the proposed dam area and the sewerage system area.

Table 5-1 shows the affected land size and estimated cost for each component. A detailed list on the asset inventory schedule is provided in appendix 6.2.

Table 5-1: Estimates of Affected Land Parcel for the various project components

	Affected Land Parcel in Acres	Affected Land Parcel in Ha	Total Compensation Cost (Inclusive of Disturbance Allowance (KES))
Dam area	64.2451	25.9996	73,881,888
Tank 1,3,4	0.997	0.4035	1,819,341
Pump station 1 & 2	3.5533	1.4380	8,494,996
WWTP	104.3822	42.2429	240,079,160
Access Road	3.053	1.2355	5,266,467
Trunk Line	9.9235	4.0160	36,069,902
	<b>186.1541</b>	<b>75.3355</b>	<b>365,611,755</b>

### 5.2 Certificate of Value

Having regard to the foregoing particulars, our terms of reference and the present day economic circumstances, it is our considered opinion that the value of the assets proposed to be affected as at the date of inspection by the *Namanga Water and Sanitation Project Corridor, Kajiado County for Compensation Purposes* is as follows:

-

Table 5-2: Summary of total valuation costs

	ASSETS CATEGORY	MARKET VALUE (KSHS)	ADD 15% DISTURBANCE ALLOWANCE (KSHS)	TOTAL VALUE (KSHS)
1	Land (186.15 Acres)	317,923,265.00	47,688,490.00	365,611,755.00
2	10% Contingency Sum			36,561,175.52
	<b>GRAND TOTAL</b>			<b>402,172,931.00</b>



**CERTIFICATION:**

This Valuation Report has been prepared for **RUNJI CONSULTING GROUP LTD, 3<sup>RD</sup> KINDARUMA ROAD (OFF NGONG ROAD), OF P.O BOX 00200, NAIROBI**, and on behalf of **PROLAND REALTORS LIMITED of P.O BOX 29509 – 01000 NAIROBI, BY: -**



.....  
**NICHOLAS KIMANTHI**  
**B.A LAND ECONOMICS (HONS), LLB (UON),**  
**DIPLOMA (I.S.K.) M. I.S.K**  
**REGISTERED & LICENSED VALUER**

**SIGNED AND SEALED ON THIS 17<sup>TH</sup> DAY OF MAY, 2023.**

## 6 Appendix

### 6.1 Valuer's Practicing License 2023

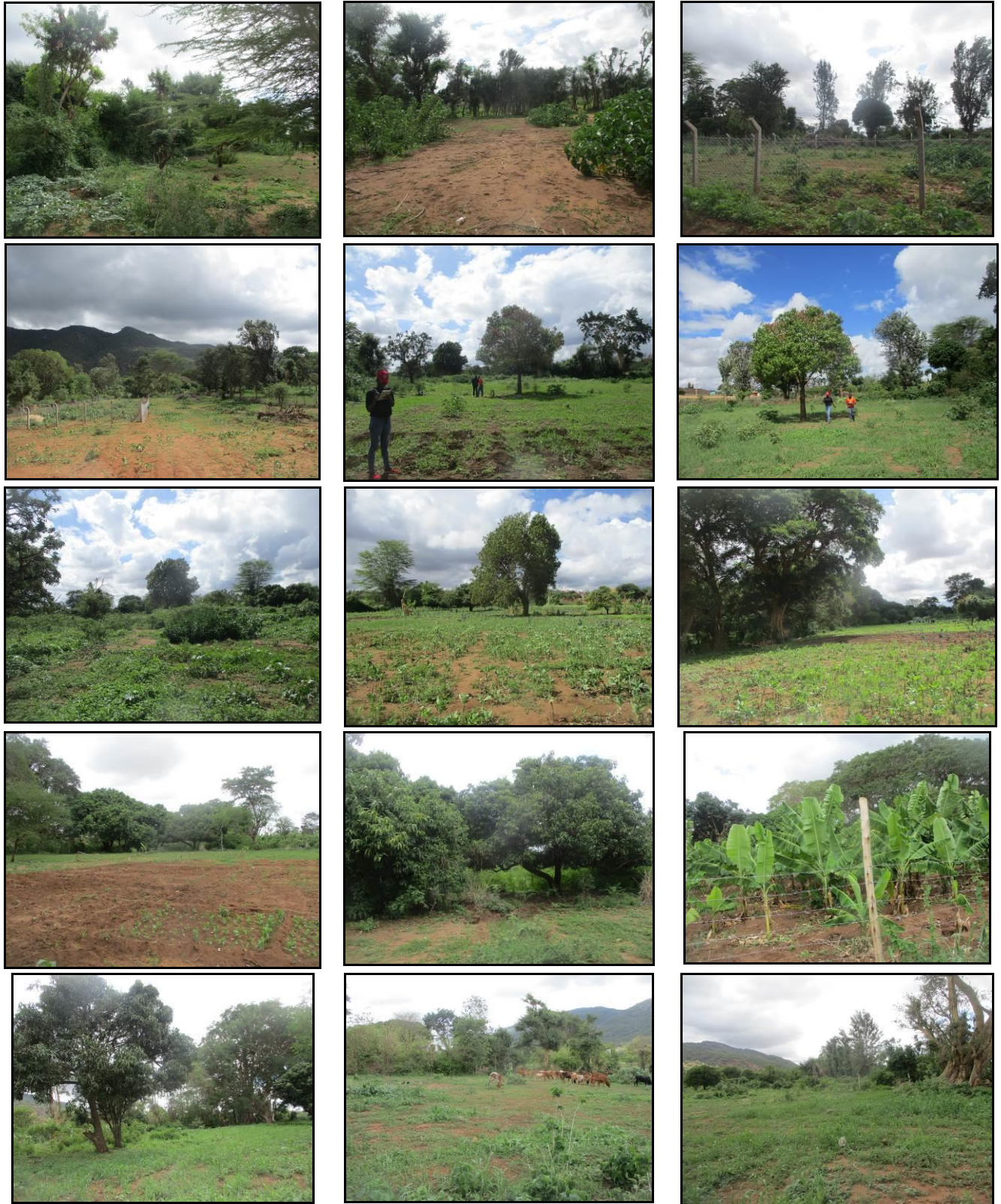


## **6.2 Asset inventory schedule**





### 6.3 Sampled photos of the affected land parcels















*Plate 6-1: Sample photos of the affected land parcels to be acquired  
Source: Photos taken during the field survey undertaken between 3<sup>rd</sup> April 2023-10<sup>th</sup> April 2023.*



## **6.4 Layouts**

### **6.4.1 General dam layout plans**

### **6.4.2 Namanga Water Transmission Lines Layout**



### **6.4.3 Namanga Town Water Distribution Layout**

### **6.4.4 Sewerage General Layout Plans**



## 6.5 Letter submitted to the Chief Conservator at KFS

**Runji Consulting Group**  
Engineering & Project Management



3, Kindaruma Road, (Off Ngong Road)  
P.O. Box 68053-00200, **Nairobi**, Kenya  
Telephone: (020) 2717213/4, 2713066  
Cell: +254 722 751889/+254 735 677627  
Email: [info@runji.co.ke](mailto:info@runji.co.ke)  
Web: [www.runji.co.ke](http://www.runji.co.ke)

Our ref: WR 970/PROJ./2022 12-13 (1), 13<sup>th</sup> December 2022

**The Chief Conservator of Forests,**  
Nairobi Conservancy,  
Kajiado Ecosystem,  
Kenya Forest Service.

Dear Sir,

**CONSULTANCY SERVICES FOR DETAILED STUDIES OF NAMANGA DAM  
WATER SUPPLY AND SANITATION PROJECT-TAWWDA/028/2020-2021**

**Asset Inventory for Valuation**

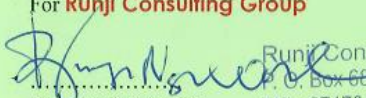
Reference is made to the above-mentioned Project study which is being undertaken by Runji Consulting Group as the consultant for Tanathi Water Works Development Agency. Reference is also made your later ref. WATER/1/KFS/VOL.XII/20 and dated 28 January 2019 granting access to Ol doinyo Orok Forest for studies related to siting of Proposed Namanga Dam Project.

As part of evaluating the feasibility of the proposed site for dam construction, the consultant is expected to prepare an Environmental and Social Impact Assessment Report and undertake valuation of all assets that will be directly affected by the Project for purposes of budgeting before the actual acquisition process.

The purpose of this letter is to kindly request your assistance in taking inventory of the trees that will be affected by the target project area within the Ol doinyo Orok Forest. The entire affected area is approximately 22.6 hectare (56acres). See attached Project layout plan.

Your assistance will be highly appreciated.

Yours sincerely,  
For **Runji Consulting Group**



Runji Consulting Group Ltd.  
P. O. Box 68053 - 00200, Nairobi  
TEL: 2717213 / 4

Eng. Runji Ngware  
**Managing Director**

Encl./  
JOM/-

Directors: Runji Ngware B.Sc(Eng.), M.Sc(Eng.), MIEK, MACEK, R.Eng.(Managing); J.Mburu B.Sc(Eng.), MIEK, R.Eng.  
M. Nyaga John B.Sc(Eng.), MIEK, R.Eng, L. K. Wesamba B.Sc(Eng.), M.Sc(Eng.), MIEK, R.Eng

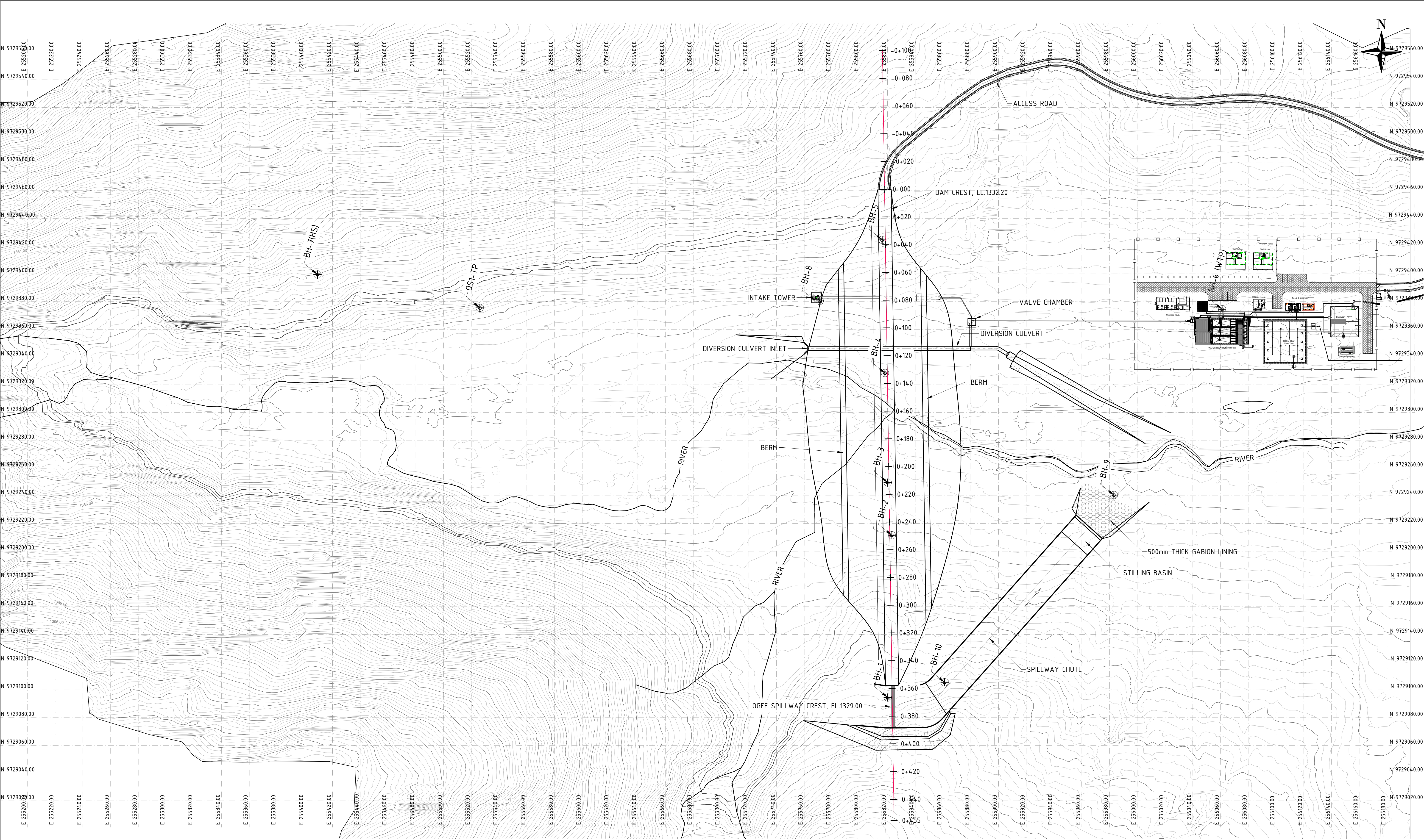
Member of FIDIC through the Association of Consulting Engineers of Kenya (ACEK)





NAMANGA DAM WATER SUPPLY AND SANITATION PROJECT -KAJIADO COUNTY													
COMPENSATION MATRIX INDICATING LAND VALUE ESTIMATES													
S/No.	Land Parcel No.	Registered Land Owners	Contact	National Identity Number	Ownership Category	Description	Google Coordinates	Size of Land affected in square metres	Size of Land Affected in Acres	Land Value Per Acre(Kshs)	Total Land Value(Kshs)	Add 15% Disturbance Allowance(Kshs)	Total Compensation amount(Kshs)
1	N/A	N/A	N/A	N/A	N/A	Tank 1	-2.227542°, 36.793374°(9723494,260174)	2,030.00	0.5016061	1,500,000.00	752,409.19	112,861	865,270.57
2	N/A	N/A	N/A	N/A	N/A	Tank 3	-2.120366°, 36.763282°(9760993,254337)	1,655.00	0.4089449	1,500,000.00	613,417.35	92,013	705,429.95
3	N/A	N/A	N/A	N/A	N/A	Tank 4	976,718,254,074	350.00	0.0864838	2,500,000.00	216,209.54	32,431	248,640.97
4	N/A	N/A	N/A	N/A	N/A	Pump Station 1	-2.412395°, 36.848671°(9727327,260011)	8,325.00	2.0570793	2,500,000.00	5,142,698.30	771,405	5,914,103.04
5	N/A	N/A	N/A	N/A	N/A	Pump Station 2	-2.233326°, 36.783452°(9750320,255335)	6,055.00	1.4961700	1,500,000.00	2,244,255.00	336,638	2,580,893.25
6	Kajiado/Mailua/85	GOVERNMENT OF REPUBLIC OF KENYA	KFS- County Conservator	N/A	Public Land	Dam area including 30M buffer zone	N/A	260,000.00	64.2451198	1,000,000.00	64,245,119.84	9,636,768	73,881,887.82
7	Kajiado/Mailua/1001	Kipas Nkinyu	788707195	N/A	N/A	WWTP	N/A	408,210.02	100.8673141	2,000,000.00	201,734,628.12	30,260,194	231,994,822.34
8	Kajiado/Mailua/3197	Toipa Lenkoi	759283590	N/A	N/A	WWTP	N/A	14,224.92	3.5149296	2,000,000.00	7,029,859.15	1,054,479	8,084,338.03
9	87	N/A	N/A	N/A	N/A	Access Road (Sewer Area)	N/A	12,355.59	3.0530245	1,500,000.00	4,579,536.69	686,931	5,266,467.20
10	N/A	N/A	N/A	N/A	N/A	Within 500m From the border/town	N/A	6,993.24	1.7280058	5,000,000.00	8,640,028.91	1,296,004	9,936,033.25
11	N/A	N/A	N/A	N/A	N/A	Within 500m - 1000m From the border/town	N/A	5,136.12	1.2691169	4,000,000.00	5,076,467.46	761,470	5,837,937.58
12	N/A	N/A	N/A	N/A	N/A	Within 1000m - 1500m From the border/town	N/A	5,041.81	1.2458153	3,500,000.00	4,360,353.45	654,053	5,014,406.46
13	N/A	N/A	N/A	N/A	N/A	Within 1500m - 2000m From the border/town	N/A	4,341.16	1.0726867	3,500,000.00	3,754,403.43	563,161	4,317,563.94
14	N/A	N/A	N/A	N/A	N/A	Within 2000m - 2500m From the border/town	N/A	2,184.25	0.5397218	3,500,000.00	1,889,026.28	283,354	2,172,380.22
15	N/A	N/A	N/A	N/A	N/A	Within 2500m - 3000m From the border/town	N/A	1,621.71	0.4007186	2,500,000.00	1,001,796.52	150,269	1,152,065.99
16	N/A	N/A	N/A	N/A	N/A	Within 3000m - 3500m From the border/town	N/A	2,143.46	0.5296413	2,500,000.00	1,324,103.32	198,615	1,522,718.81
17	N/A	N/A	N/A	N/A	N/A	Within 3500m - 4000m From the border/town	N/A	2,596.55	0.6415983	2,000,000.00	1,283,196.52	192,479	1,475,675.99
18	N/A	N/A	N/A	N/A	N/A	Within 4000m - 4500m From the border/town	N/A	2,316.57	0.5724173	2,000,000.00	1,144,834.69	171,725	1,316,559.90
19	N/A	N/A	N/A	N/A	N/A	Within 4500m - 5000m From the border/town	N/A	3,822.81	0.9446038	2,000,000.00	1,889,207.64	283,381	2,172,588.78
21	N/A	N/A	N/A	N/A	N/A	Within 5500m - 6000m From the border/town	N/A	1,438.33	0.3554075	1,800,000.00	639,733.48	95,960	735,693.50
22	N/A	N/A	N/A	N/A	N/A	Within 6000m - 6500m From the border/town	N/A	813.85	0.2011003	1,800,000.00	361,980.53	54,297	416,277.61
						TOTAL		753,366	186.1541629		317,923,265	47,688,490	365,611,755
						10% Contingency sum to cater for forest material							36,561,175.52
						GRAND TOTAL							402,172,931





GENERAL LAYOUT PLAN  
SCALE 1:1250

A				
REV	Description	Sign	Date	Approved

Design Consultant:




Runji Consulting Group Ltd

Engineering & Project Management.

P.O.Box 68053 - 00200 Nairobi

Designed by:	JOM	Drawn by:	MIKE
Sign:.....		Sign:.....	
Checked by:	MTB	Approved by:	R.N
Sign:.....		Sign:.....	



TANATHI WATER WORKS  
DEVELOPMENT AGENCY

Project Manager:

Date:

Date:

Engineer:

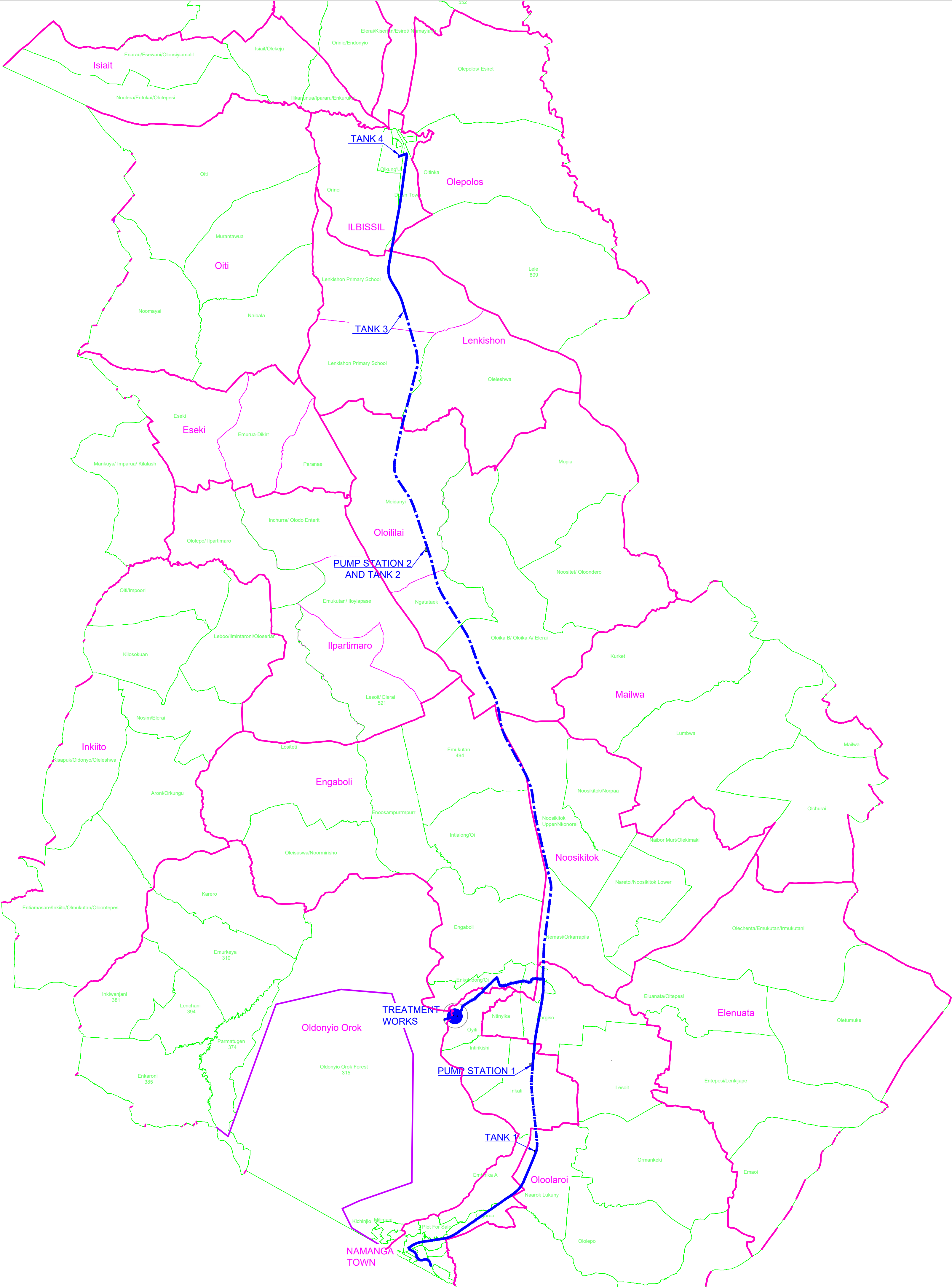
Date:

Sign:.....

Sign:.....

Project:	CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECTS		
Drawing Title:	GENERAL DAM LAYOUT PLAN		
Scale:	NTS	Sheet No:	1 / 1
Drawing No:	WR970-GL-001		





LEGEND

- — — RISING MAIN
- GRAVITY MAIN
- VILLAGE BOUNDARY
- SUBLOCATION BOUNDARY

	Arc 1960 / UTM zone 37S		
Tank Designation	N	E	Volume (m3)
Tank 1	9723517.235	260175.902	2000
Tank 2	9750317.251	255332.868	150
Tank 3	9761000.267	254335.917	1000
Tank 4	9767912.106	254076.938	100
Pump Designation	N	E	
Pump Station 1	9727325.591	259977.698	
Pump Station 2	9750317.251	255332.868	

	REVISIONS	SIGN	DATE	APPROVED
C				
B				
A				
	ISSUED FOR TENDER			

Consultant:



**Runji Consulting Group Ltd**  
Engineering & Project Management.  
3, Kindaruma Road (Off Ngong Road)  
P. O. Box 68053-00200 Nairobi  
Tel. (020) 2717213/4

Project: CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECT

Scale(s) As Shown Date: MARCH 2023

Dwg. No. WR970/NAM/GL/01A

Design by: M.M.N Drawn by: P.W.K

Sign..... Sign.....

Checked by: M.M.N Approved by: R.N

Sign..... Sign.....

CLIENT:



**TANATHI WATER WORKS DEVELOPMENT AGENCY**

CONTRACT NO: TAWWDA/028/2020-2021

PROJECT MANAGER DATE ENGINEER DATE

Sign..... Sign.....

DWG. Title: GENERAL LAYOUT PLAN - TRANSMISSION MAINS







# Sanitation

## **CERTIFICATION**

We hereby certify that the content of this Environmental and Social Impact Assessment Report for the Proposed Namanga Dam Water Supply and Sanitation Project (Sanitation component) is factual and that the content conforms to the provisions of the Environmental Management and Coordination Act Cap. 387 and the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2003.

## **CONSULTANT**

### **RUNJI CONSULTING GROUP LTD**

Name: Sammy Letem

Designation: Lead Expert (NEMA Reg. No 0401)

Signature: [Signature] Runji Consulting Group Ltd.

P. O. Box 68053 - 00200, Nairobi

TEL: 2717213/4

Date: 26/06/2023

## **PROPONENT**

### **TANATHI WATER WORKS DEVELOPMENT AGENCY**

Name: FREDRICK TITO MWAMATI (P. Eng. Tech.)

Designation: Chief Executive Officer

Signature: [Signature]

TANATHI WATER WORKS DEVELOPMENT  
AGENCY  
PRIVATE BAG,  
KITUI

Date: 30<sup>th</sup> May, 2023



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## **ABBREVIATIONS**

ACC	Assistant County Commissioner
ASAL	Arid and Semi-Arid Lands
CECM	County Executive Committee Member
CBO	Community Based Organization
CSR	Corporate Social Responsibility
CC	County Commissioner
DCC	Deputy County Commissioner
DOSHS	Directorate of Safety and Health Services
DWC	Double Wall Corrugated
EMCA	Environmental Management Coordination Act
EHS	Environmental Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GDP	Gross Domestic Product
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Virus
KFS	Kenya Forest Services
KMD	Kenya Meteorological Department (KMD and
KWS	Kenya Wildlife Services
ICOLD	International Commission on Large Dams
KWS	Kenya Wildlife Services
LPG	Liquefied Petroleum Gas
MCA	Member of County Assembly
MD	Managing Director
MP	Member of Parliament
MoWSI	Ministry of Water, Sanitation & Irrigation
NEMA	National Environment and Management Authority
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organization
O & M	Operation and Maintenance
ODF	Open Defecation Free
OLWASCO	Ol Doinyo Orok Water & Sewerage Company Ltd
OSHA	Occupational Safety and Health Act
OWASCO	Olkejuado Water & Sewerage Company
PAPs	Project Affected Persons

PPE	Personal Protective Equipment
RAP	Resettlement Action Plan
RC	Reinforced Concrete
RCC	Roller Concrete Compacted
SDG	Sustainable Development Goal
SGR	Standard Gauge Railway
SOPs	Standard Operating Procedures
SSHP	Site Safety Health Procedures
STIs	Sexually Transmitted Diseases
TAHMO	Trans-African Hydro-Meteorological Observatory
TAWWDA	Tana Athi Water Works Development Agency
ToR	Terms of Reference
WASREB	Water Services Regulatory Board
WHO	World Health Organization
WRA	Water Resources Authority
WRUA	Water Resources Users Association
WTP	Water Treatment Plant
WWTP	Waste Water Treatment Plant





## 0 EXECUTIVE SUMMARY

### 0.1 Introduction

This Environmental Social Impact Assessment Report is prepared in line with the Terms of Reference (TOR) for the **Consultancy Services for Detailed Design of Namanga Dam Water Supply and Sanitation Project**. It is also prepared as per the Environmental Management Coordination Act CAP 387, for submission to National Environment Management Authority for obtaining an EIA license before construction of the project commences. The key objectives of the assignment are to carry out Detailed Designs and Tender Documentation for Namanga Dam Water Supply and Sanitation Project. This report focuses on the sanitation component of the project.

### 0.2 Project Background

Sanitation is an important factor in the overall function of a human wellbeing. This is particularly the case in urban centres where significant amount of sewer is generated. Lack of sanitation infrastructure in a town bears negative impact on the health and productivity of the inhabitants. This has been the case in Namanga Town which has been growing in population devoid of sewerage services. It is against this background that the proponent, Tanathi Water Works Development Agency has proposed to construct a Sewerage system and Waste Water Treatment Plant for Namanga Town in Kajiado County.

The proposed sanitation project will serve Namanga Town in Kajiado County. Though the town has been growing in population, the it has not been connected to a sewer system. As a result, residents have to rely on exhauster services which are mainly from the bordering Country-Tanzania. This is a costly and inconvenient disposal method. It predisposes residents to waterborne diseases, unsanitary conditions and poor living conditions. It bears a negative impact on investment potential and the land value in the area. It is against this background that the proponent has proposed to develop a water supply project so as to address the challenge of inadequate water supply in the area. This report presents the Environmental Social Impact Assessment Report and a methodology to be adopted in the preparation of the Resettlement Action Plan.

### 0.3 Project Description

The sewerage system proposed caters for the collection of town wastewater by a 9.1 km trunk line and 10.9km primary sewer lines. The proposed Trunk is located along the river valley to give it adequate gradient for any future connections. Waste Stabilisation Ponds have been proposed for the Ultimate Sanitation Works to treat Wastewater from sections of the Namanga Town. It is 8Km East of Namanga town, and a trunk sewer line and primary sewer lines for the town.

### 0.4 Objectives of the ESIA

The specific objectives of the ESIA study include:

- To establish the baseline conditions in the project area so as to determine the likely impacts of the project on existing resources and infrastructures
- To identify both positive and negative environmental impacts associated with the project and provide for mitigation measures of the negative impacts.



- Identification and analysis of stakeholders relevant to the project at both national and local levels for purposes of stakeholder consultation
- Preparation of an include an Environmental and Social Management Plan (ESMP) including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.
- Create awareness about the project and obtain opinions and concerns regarding the proposed project i.e. location, design, operation and management through public participation and consultation meetings as per Part II Section 17 of the Environmental (Impact assessment and Audit) Regulations, 2003

### 0.5 Project Methodology

The ESIA team conducted Project Screening and Scoping that identified all the environmental impacts associated with the proposed project. A Terms of Reference for ESIA study was prepared and an approval to undertake ESIA Study was issued by NEMA. (See Appendix 10.2 for the TOR Approval).

A Stakeholder Engagement Plan was developed as per the mapped stakeholders. Key Informant Interviews were conducted among the Secondary Stakeholders. Public meetings were also held in Namanga and Maili Tisa towns to create awareness about the project and obtain their views. The views of the public and secondary stakeholders are summarised in Chapter Five of this report.

### 0.6 Policy Legal and Regulatory Framework

The following frameworks were reviewed by the Consultant; The Constitution of Kenya, The Kenyan Vision 2030, National Policy on Water Resources Management and Development, Policy Guidelines on Environment and Development, Sustainable Development Goals.

Some of the policies and regulatory frameworks that were reviewed are outlined below:

a) **Sanitation Policy and Regulatory Framework-**

- Public Health Act, CAP 242
- Water Quality Regulations, 2006, (Legal Notice No.121)

b) **Environmental Policy and Regulatory Framework**

- National Environment Action Plan Framework,
- Environment Management & Coordination Act Cap 387
- The Environmental (Impact Assessment and Audit) Regulations, 2003/Legal Notice 31 & 32
- Environmental Management and Coordination (Conservation of Biological Diversity) Regulations 2006
- Environmental Management and Coordination (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulations 2009
- Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007
- Environmental Management and Co-ordination (Waste Management) Regulations, 2006

- Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations 2006
- Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Control Regulations, 2009

## 0.7 Public Participation and Stakeholder Engagement

The assessment involved mapping and identification of key stakeholders in sanitation management. The aim was to inform them of the proposed project, seek their opinion and expertise and develop an environmental management plan based on this input. The key stakeholders engaged include: Department of Water services, Department of Environment, National Environment Management Authority, National Government Administration Office-Namanga and Kenya Forest Service. Public consultation involved conducting community meeting at different project sites. This was facilitated by the relevant NGAOs. Additionally, it involved household data collection to establish individual concerns and opinions with regard to the project. The outcome of these meetings and household survey is annexed to this report.

## 0.8 Project Alternatives

This report details an analysis of the major project alternatives which include: sewer treatment plant siting, sewer line system and piping material. Further it includes an evaluation of the no project option which is advantageous from a conservative perspective but not optimal in terms of meeting the sanitation needs of the residents of Namanga.

## 0.9 Potential Project Impacts and Proposed Mitigation Measures

Construction Phase	Positive Impacts	Negative Impacts
	<ul style="list-style-type: none"><li>• Job opportunities</li><li>• Skill transfer to the local communities</li><li>• Promotes local businesses through sourcing of construction materials locally and other enterprises such as accommodation and catering</li><li>• Improvement of infrastructure e.g. roads that provide access to the project site</li><li>• Improved livelihoods in the area as money generated from increased businesses in the area and compensation enables the locals to engage in development activities like construction of rental houses, fees for educating children, replenishing of livestock lost during drought</li></ul>	<ul style="list-style-type: none"><li>• Vegetation clearance</li><li>• Soil disturbance and erosion</li><li>• Air pollution</li><li>• Land degradation due to excavation activities</li><li>• Noise and vibrations</li><li>• Solid waste generation</li><li>• Conflicts due to disgruntled PAPs</li><li>• Occupational hazards such as falls, fire and other injuries</li><li>• Increased population influx-insecurity, moral decadence</li><li>• Water quality</li></ul>



Mitigation Measures	<ul style="list-style-type: none"> <li>• Carry out proper disposal of the soil and other materials that will result from land clearance and excavation to avoid sedimentation in river and wind erosion</li> <li>• Plant native grass and trees where appropriate on the bare land after project completion to reduce soil erosion and restore aesthetic appearance on the land</li> <li>• Sprinkle water on the ground before earth moving to control dust emission into the air</li> <li>• Equip the machines to be used with standard noise attenuation features and use machines with the accepted noise limits</li> <li>• Besides, proper management of oil and solid wastes arising from construction activities will be done including sensitization of the workers on waste management.</li> <li>• Involvement of local leaders in project planning</li> <li>• Establish standard procedures for skilled and non-skilled employment</li> <li>• Institute a grievances and redress committee</li> <li>• Demarcate construction areas and routes to these sites</li> <li>• Adhere to the noise and vibrations protocols provided for in regulations</li> <li>• Ensure the environmental assessment report and the RAP is validated</li> <li>• Adopt occupational health and safety guidelines</li> </ul>	
Operation Phase	<b>Positive Impacts</b> <ul style="list-style-type: none"> <li>• Improved public health</li> <li>• Improved living conditions</li> <li>• Increased revenue and sustainability of OLWASCO &amp; OWASCO</li> <li>• Institutional strengthening &amp; Capacity building for the water companies</li> <li>• Improved aesthetics</li> <li>• </li> </ul>	<b>Negative Impacts</b> <ul style="list-style-type: none"> <li>• Public health hazards due to blockage, leaks and overflows</li> <li>• Contamination of water resources -surface and ground</li> <li>• Odour nuisance</li> <li>• Increased cases of malaria infections at the sewer treatment area</li> <li>• Macroclimate alteration</li> <li>• Insecurity issues such as destruction of sewer pipes, vandalism of equipment</li> <li>• Increased water demand</li> </ul>
Mitigation Measures	<ul style="list-style-type: none"> <li>• The treatment pond should be made as impermeable as practically possible in order to prevent possible contamination of ground water or shallow wells in the area</li> <li>• Ensure that the sewerage is properly treated before disposal</li> <li>• Quality tests should be conducted to ensure that it meets the expected public health standards</li> </ul>	



	<ul style="list-style-type: none"><li>• Mitigating this impact entails ensuring proper design and alignment of the treatment lagoons and planting trees around the area where the ponds/lagoons are located for wind breaking.</li><li>• Consider rain water harvesting to have alternative water supply for use at the sanitation facility</li></ul>
Recommendations	<ul style="list-style-type: none"><li>• During the construction phase, allow Kajiado County to have an officer as part of the management and be actively involved in the site meetings</li><li>• Ensure public participation in all project stages</li><li>• Client should be actively involved in the project from the planning, design, construction to commissioning and ensure adequate funding is available throughout the project cycle.</li><li>• Engage the local leaders to create a ‘buy in’ and project support to ensure sustainability</li></ul>



# 1 INTRODUCTION

## 1.1 Project Background

Sanitation is a critical component of human wellbeing. The SDG 6 on clean water and sanitation envisages that every individual should have access to water and improved sanitation by the year 2030. Though Kenya has made remarkable milestones in improving access to safe water and sanitation services, there are some areas of the Country that are still lacking adequate sanitation services. Namanga Town in Kajiado County is one of these areas that are underserved. As a result, the residents face public health related risks such as waterborne diseases which account for 60% of all diseases in Kenya and disease outbreaks.

Additionally, sanitation plays a key role in economic development in Kenya. Lack of sanitation also holds back economic growth. It contributes to significant economic losses in any society. The economic losses are mainly driven by premature deaths, the cost of health care treatment, lost time and productivity seeking treatment, and lost time and productivity finding access to sanitation facilities. Pollution resulting from improper disposal and treatment of wastewater and domestic faecal sludge also affects both water resources and ecosystems. At the same time, faecal sludge and wastewater can provide valuable resources such as water, nutrients, soil conditioner, briquettes and energy and economic opportunities in urban areas.

Kenya's Vision 2030 for water and sanitation seeks to ensure that improved water and sanitation is available and accessible to all. It is against this background that the Government of Kenya through the Ministry of Water, Sanitation and Irrigation, Tanathi Water Works Development Agency (TAWWDA) intends to develop Namanga Dam Water Supply and Sanitation Project to improve the current situation and provide for future water supply and sanitation needs of the Project area.

TAWWDA is one of the Nine Water Works Development Agencies in Kenya that are responsible for the development, maintenance and management of water and sewerage infrastructure. The Agency serves Kitui, Makueni, Machakos, and Kajiado Counties. In line with this mandate, TAWWDA has engaged an Engineering Consultant, Ms. Runji Consulting Group Ltd to undertake: “**Detailed Designs and Tender Documentation for Namanga Dam Water Supply and Sanitation Project.**” The Consultant will also undertake an Environmental and Social Impact Assessment and prepare the Resettlement Action Plan (RAP) of Project Affected Persons (PAPs). This report is the outcome of an environmental and social impact assessment for the sanitation component.

## 1.2 Project Justification

Namanga Town like other emerging towns is characterized by increased urban population occasioned by border activities and the positive fruits of devolution which has created opportunities in what was small market centres and towns turned into busy commercial centres and local government administrative centres. However, infrastructure development in these towns has not been commensurate with the population growth. Consequently, most of them lack critical infrastructure services such as water and sanitation while in some cases the existing infrastructure is dysfunctional due to system overload. Namanga town has no centralized sewerage system. The use of on-plot sanitation systems such as pit latrines and septic tanks for disposal of effluent is prevalent. Effluent from septic tanks is mostly transported to the neighboring country, Tanzania, using exhaust vacuum tanker. This on-plot sanitation systems



though manageable at present it will not be sustainable for long with the rapid population growth and reliance of the neighboring country for effluent disposal. Moreover, with additional water resources development and expansion of distribution network, the use of on-plot sanitation systems will not suffice and thus health and environmental hazards are bound to occur. It is therefore critical that the government and other stakeholders prioritize on provision and improvement of basic infrastructure. This will ensure harmonious and sustainable development of the emerging urban centres.

### **1.3 Purpose of the Study**

The proposed project aims to improve public health conditions in Namanga Town through provision of a sewer line, a treatment plant and complementary facilities. This undertaking will bear both positive and negative impacts during planning, construction and implementation phases. The benefits will include employment during construction and improved sanitation and public health in the long term. However, it is notable that the construction and operation processes may generate negative environmental and social impacts. Such negative effects if not properly managed may obscure the realization of benefits anticipated from the proposed development. It is therefore paramount that a comprehensive assessment of possible negative impacts is undertaken to identify mitigation measures and safeguards that need to be instituted during the project period.

In an attempt to ensure that development provides optimal benefits without creating a significant social and environmental burden, the Government of Kenya has put in place wide range of policy, institutional, and legislative framework to address major causes of environmental degradation and negative impacts on ecosystems deriving from development programs. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound. It is an obligation of the Kenya Government to conduct an Environmental and Social Impact Assessment (ESIA) on development projects such as the proposed Sanitation Project in Namanga Town. The ESIA assesses the impacts of a proposed project before commencement of implementation. In addition to helping formulate environmental management framework, EIA provides for public participation in the decision-making process within the proposed project.

### **1.4 Objectives of the Study**

The specific objectives of the ESIA study include:

- To establish the baseline conditions in the project area so as to determine the likely impacts of the project on existing resources and infrastructures
- To identify both positive and negative environmental impacts associated with the project and provide for mitigation measures of the negative impacts.
- Identification and analysis of stakeholders relevant to the project at both national and local levels for purposes of stakeholder consultation
- To solicit views/opinion of the public and neighbours on the impacts of the project, and
- Preparation of an include an Environmental and Social Management Plan (ESMP) including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.

## 1.5 Scope of the Study

This Environmental and Social Impact Assessment (ESIA) project report was prepared as per the provisions of the Environmental Management and Coordination Act No. 8, 2015 and more specifically to Environmental Impact Assessment Regulations 2003. In accordance with the ToR, the scope of the assignment entails:

- Detailed description of the proposed project
- Assessment of the baseline conditions in the project area
- Analysis of the relevant policy, legal and regulatory frameworks
- Analysis of alternative to the project site, design and inputs
- Identification of anticipated social and environmental impacts and their mitigation measures during the construction, operation and decommissioning phase
- Development of an environmental and social management plan

## 1.6 Approach and Methodology

The study adopted an investigative approach as specified under the legal notice 101 of EMCA 1999, (amended in 2015) was adopted. The following methodology was adopted for the EIA project:

- **Document Review**

Relevant documents relating to the proposed project was conducted to gain an in-depth understanding and to gain sufficient background information regarding the project. A review of engineering drawings, various policies, regulatory and relevant legal documents was also carried out.

- **Field Data Collection**

A survey and a physical inspection for the project was conducted to allow gathering of information on the biophysical, a biophysical and social aspects of the proposed project site. The study also sought public opinion/views through Consultation and Public Participation (CPP) exercise.

### 1.6.1 ESIA Process

#### 1.6.1.1 Screening

It comprises of the initial identification of potential interactions between the Project and physical, ecological and human receptors indicating the level of impact assessment required. It also involves examination of relevant national and international legislative requirements and an illustration of the potential interactions of project activities with the physical, ecological and human receptors.

#### 1.6.1.2 Scoping

Scoping entails identification of considerable negative environmental and social impacts of a proposed project. The assessment conducted reviews of secondary data sources (including engineering designs, published journals, similar reports) and other relevant documents to collect relevant information. Some of the information that was collected through this process included status of sewerage distribution system (infrastructure) in the project area, current sanitation infrastructure and its accessibility, the capacity of the current systems and customer needs and preferences and possible mitigation measures. Further, the information collected

form literature review was validated through key informant interviews with relevant stakeholders. Discussions with project beneficiaries also provided information on possible significant impacts of the proposed project and were used in development of the management plan for the project.

#### **1.6.1.3 Baseline Field Surveys and Studies**

Field Studies included:

- **Hydrological Analysis:** This is an analysis of meteorological data, catchment delineation, and reservoir volume particularly to understand the environmental flows, flood frequency and sediment load analysis.
- **Geotechnical assessment:** This involves detailed soils and materials investigations which include trial pitting, laboratory tests for foundation characteristics of the various structures and for construction material sourcing.
- **Baseline Survey:** The Consultant will undertake a household survey within the project area to understand the existing socio-economic conditions. The information will be used in assessing how livelihoods will be affected especially due to displacements.
- **Asset Inventory:** The Consultant will obtain cadastral maps, determine land tenure, identify the registered landowners of the affected private land parcels and develop a record of structures, crops, trees as well as costing.

#### **1.6.2 Impact Assessment Framework**

The process of assessing the potential project impacts is centred on the following aspects:

- **Prediction-**What will happen to the environment because of this project?
- **Evaluation-**Will it have a beneficial or adverse effect? How big is the change expected to be? How important will it be to the affected receptors?
- **Mitigation:** If the impact is of concern, can anything be done to avoid, minimise, or offset the impact or to enhance potential benefits?
- **Residual Impact:** After mitigation, is the impact still of concern?

Environmental and Social Management Plans (ESMPs) are developed to capture all mitigation and management measures, and environmental and social commitments made within the ESIA Report. Adherence to these plans will be a condition of any Project construction and operation contracts awarded.

#### **1.6.3 Stakeholder Engagement**

The ESIA team will map out the relevant stakeholders who are likely to be affected by the proposed project either directly or indirectly. A stakeholder analysis will be conducted to determine their level of power and interest in order to know the best approach for engaging them and the significance of their input to the project. A Stakeholder Engagement Plan has been developed and the feedback from the stakeholders is discussed in detail in Chapter five of this report.

### **1.7 Structure of the Study Report**

Environmental and social impact assessment will include:

**Executive summary:** This section presents a summary of the entire report.

**Chapter 1: Introduction:** This chapter gives description of the Project Background, Project History, Consultants Assignments and TORs, Justification of the Project, Study Methodology and Field Findings, and Scope and Content of the project.

**Chapter 2: Project description:** This chapter gives a description of the status of the project in the project cycle, specifically during construction, operation and decommissioning.

**Chapter 3: Policy, legal and institutional / administrative framework:** This chapter outlines the overview of legislative framework, regulatory, international guidelines and conventions relevant to this project.

**Chapter 4: Environmental setting:** This chapter gives description of the environmental setting of proposed project and surrounding areas, e.g., climate, soils, geology, vegetation, fauna, land use, human populations, socio-economics, cultural heritage.

**Chapter 5: Stakeholder Engagement:** This chapter gives description of the objectives, methods used and summary of results of the public consultation activities undertaken during the ESIA.

**Chapter 6: Analysis of alternatives:** This chapter gives a description of the project details of the proposed project, alternative options, designs and implementation strategies.

**Chapter 7: Assessment of environmental impacts and mitigation measures:** This chapter presents the analysis of beneficial and adverse impacts of the project on the biophysical and human (social, cultural and economic) environments. The analysis covers anticipated impacts during the construction, operation phases and decommissioning phases and describes the enhancement and mitigation measures proposed to enhance benefits.

**Chapter 8: Environmental and social management and monitoring Plans:** This chapter presents the proposed Environmental and Social Management and Monitoring Plans prepared for the project.

**Chapter 9: Conclusion and recommendations:** The conclusion briefly presents the environmental and social acceptability of the project, taking into account the impacts, measures and recommendations identified during the assessment process.

**Appendix and Annex:** This section presents attached documents such as Minutes and supplementary reports.

## 2 PROJECT DESCRIPTION

### 2.1 Project Location

#### 2.1.1 General Project Area

The sanitation component will be constructed in Namanga Town in Kajiado County. The sewer line will be laid in Namanga Town draining into a Sewer Treatment Plant at Ormangeki in Namanga (UTM Zone 37M Co-ordinates 253 894E, 9 718 151 N). It is approximately 5 KM off the Nairobi-Namanga road. The proposed WWTP site lies on a 100 acres' piece of land though the project works are expected to only cover 50 acres. The other acreage is meant for future expansion of the WWTP. It neighbours one residential house (600 Meters) a school (800 Meters). Most of the area around the proposed site is undeveloped, characterized by grass and shrubs.



Figure 2-1: General Layout Plan of Namanga Sewerage System







Plate 2-1: Neighbouring land uses at the STP site



Plate 2-2: School neighbouring the proposed WWTP Site

## 2.2 Project Components

The proposed project will provide for stabilization ponds at 8Km East of Namanga town, and a trunk sewer line and primary sewer lines for the town. It will serve the whole Namanga town and provide a central point where exhausters will safely discharge the wastewater from satellite urban centers.

### 2.2.1 Sewerage System

The sewerage system proposed caters for the collection of town wastewater by a 9.1 km trunk line and 10.9km primary sewer lines. The proposed Trunk is located along the river valley to give it adequate gradient for any future connections.

To enhance actualization of the sewerage system, 100 number consumer connections are considered. Each consumer connection comprises of 50m DWC pipeline of 250mm diameter, one 900mm diameter collection chamber and one number 600x600mm inspection chamber. All public institutions such as schools within Namanga town are to be connected. The specific connections will be identified during implementation in liaison with the service provider.

The topography of the town offers sufficient drainage of the township area through gravity up to the waste water treatment plant. The sewerage network has been proposed based on the general topography of the town and the town physical development plan.



The wastewater flows that is to be collected and conveyed for treatment has been estimated considering the population densities and the earmarked land. The proposed sewerage reticulation system in the project consists of only the Trunk and Primary sewers.

Secondary and Lateral sewers to connect to properties will be privately developed or be done at a later phase of the project.

The proposed sewer reticulation lines for the town consist of the following sizes: -

*Table 2-1: Proposed sewer sizes and lengths for the project area*

Item	Sewer Size and Description	Length of the Proposed Sewer line (m)
1	500mm dia HDPE DWC SN 4	8,100
2	400mm dia HDPE DWC SN 4	1,000
3	300mm dia HDPE DWC SN 4	10,000
4	250mm dia HDPE DWC SN 4	5,000
<b>Total</b>		<b>25,000</b>



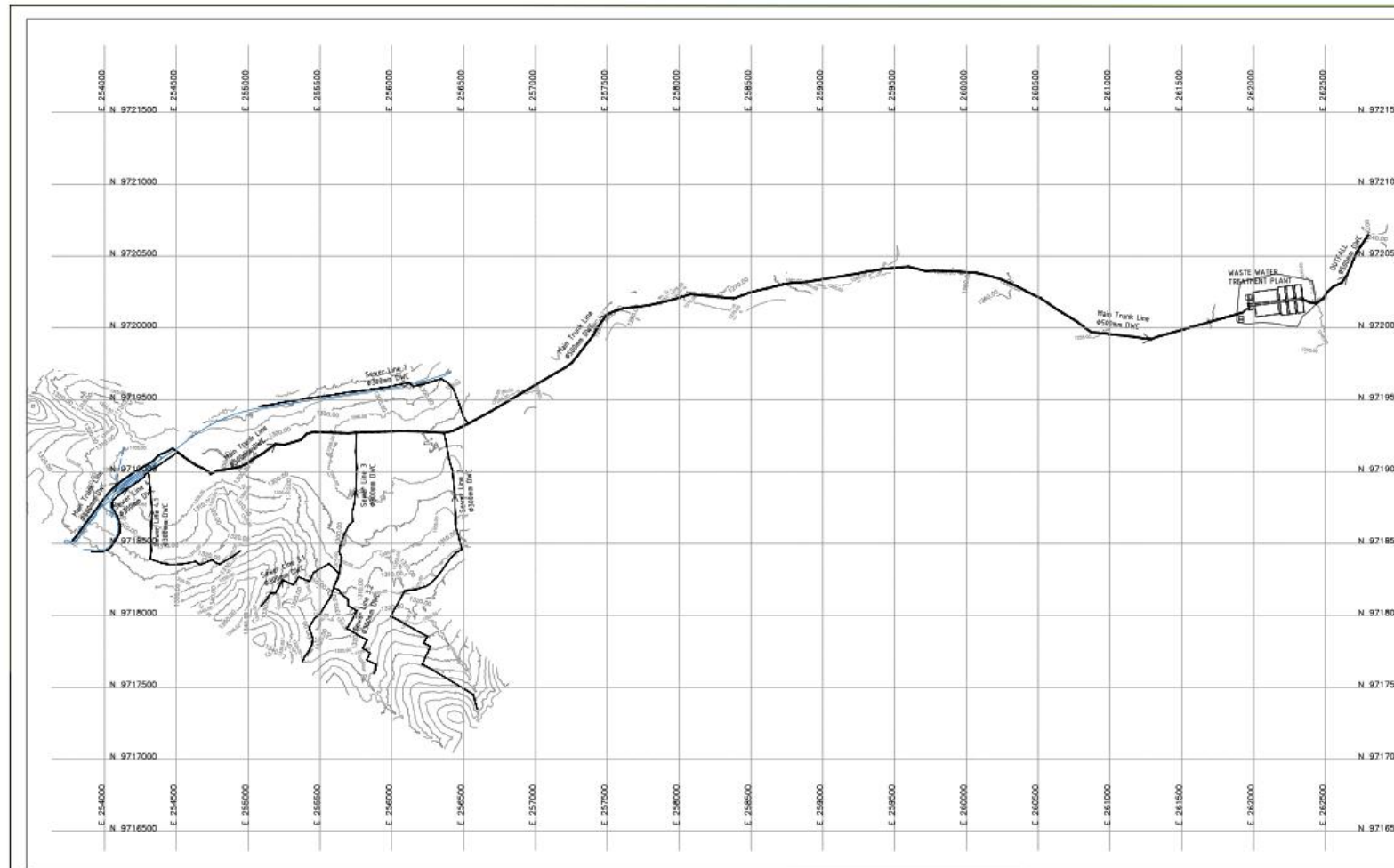


Figure 2-2: Namanga Sewerage general Layout Plan



### 2.2.2 Sewage Treatment works

Waste Stabilisation Ponds have been proposed for the Ultimate Sanitation Works to treat Wastewater from sections of the Namanga Town. The choice of stabilization ponds for both wastewater has been made taking into consideration the following: -

- Appropriateness of Technology
- Environmental conditions for the area
- O&M requirements

### 2.2.3 Discharge effluent standards

The national standards for effluent discharge to natural water body adopted for the design are as follows: -

- |                              |   |               |
|------------------------------|---|---------------|
| • Effluent BOD concentration | = | 20 mg/l       |
| • Effluent FC concentration  | = | 5000 FC/100ml |
| • Suspended solids           | = | 30mg/l        |

### 2.2.4 Design and description of the proposed Sewage Treatment Works

#### 2.2.4.1 Process units

The sewage treatment works recommended will be for full treatment process.

The process units will consist of the following major units: -

- Manually cleaned bar screen at the inlet
- Manually cleaned bar-screen for the by-pass
- Flow Measuring device at inlet and outlet
- Anaerobic Ponds
- Facultative Ponds in series
- Maturation Ponds in series

In addition to the proposed treatment process units, the project will include the following: -

- Gate House and Control building.
- Laboratory for process control and monitoring
- Electricity supply to the WWTW site
- Access roadworks to the WWTW site and between the ponds.

#### 2.2.4.2 Location of the ponds

To cater for collection and disposal of wastewater within the whole of Namanga Town, the stabilization ponds have been proposed at 8Km east of Namanga town. The co-ordinates of the ponds location are: 37M, 261931, UTM 9720116

#### 2.2.4.3 Evaporation and seepage

The ability to maintain a satisfactory water level in the ponds is one of the most important aspects of design. A minimum depth of water of 1m should be maintained in the ponds to discourage growth of aquatic weeds and vegetation.

It is therefore proposed that the ponds be lined by a 75mm thick concrete during construction to reduce seepage into the underground water.



## 2.2.5 The Proposed Wastewater Stabilization Pond System

Following detailed designs for the ponds in parallel streams, the dimensions below were recommended. The construction dimensions adopted for the anaerobic, facultative and maturation ponds adopted for the sewage flows of 3,000m<sup>3</sup>/day for the initial year. For the future year and the ultimate, a detailed design is being undertaken under a different contract.

Table 2-2: Proposed Namanga Ponds

Pond Type	Description	Initial Year (2046)
<b>Anaerobic Ponds</b>	No. of ponds in parallel	2
	Length/Width ratio	1
	<b>Length (m)</b>	<b>31</b>
	<b>Width (m)</b>	<b>31</b>
<b>Facultative Ponds</b>	<b>Depth (m)</b>	<b>3</b>
	No of ponds in parallel	2
	Length/Width ratio	2
	<b>Length (m)</b>	<b>166</b>
<b>Maturation Ponds</b>	<b>Width (m)</b>	<b>83</b>
	<b>Depth (m)</b>	<b>2</b>
	No. of ponds in parallel streams	2
	No. of ponds in series per stream	3
	Total number of ponds	6
	Length/Width ratio	2
<b>Maturation Ponds</b>	<b>Length (m)</b>	<b>94</b>
	<b>Width (m)</b>	<b>47</b>
	<b>Depth (m)</b>	<b>1</b>

Table 2-3: Expected treated effluent quality from Namanga Ponds

Location	Pond Type	Retention Time (days)	Effluent BOD (mg/l)
<b>Namanga</b>	Anaerobic	2	184
	Facultative	19	46
	Maturation 1	3	34.5
	Maturation 2	3	25.9
	Maturation 3	3	19.4

### 2.2.5.1 Ancillary works

The civil and ancillary works proposed for the treatment works site include the following: -

- Inlet Works
- Outfall Sewer
- Site works and gravel access road
- Sludge drying beds
- Fencing of the entire sewage treatment works and gate





- Administration building
- Two Staff houses
- Guardhouse

#### **2.2.6 Sludge drying beds**

The anaerobic ponds will be de-sludged once they have accumulated sludge to half the depth of the pond. This is estimated to take 2 years with an expected production of 680m<sup>3</sup> of sludge. It is proposed that sludge drying beds are used to stabilize and dry the sludge before it is disposed or sold as manure. To cater for this volume, the designs proposes 2 No. drying beds that are 30m long, 18m wide and 0.6m deep. The effluent from the beds will be collected by a perforated pipe at the base of the ponds and directed to the anaerobic ponds for treatment. The beds will be located a short distance to the west of the anaerobic ponds to reduce the sludge haulage distance. The sludge drying bed is designed and dimensions found to be 30m x 18m x 0.6m. The total land requirement for the proposed ponds is estimated at 15ha.

#### **2.2.7 Disposal of treated effluent**

The treated effluent from the WSP is expected to meet NEMA standards for discharge into the environment and therefore will be discharged directly into River.

#### **2.2.8 Ablution Blocks**

Ablution Blocks are essential in Namanga Town for improved access to sanitation facilities especially in public places e.g., markets, bus stops, schools, etc. They are important to market vendors, market customers, long distance travelers, bus operators and the general public. Their locations in Namanga Town will be selected in consultation with the Water service providers and the County Government of Kajiado.

Considering the population densities and the number of urban centers, a total of four (4) Ablution Blocks are proposed for construction in Namanga Town. Each Ablution Block comprises of six (6) toilets and two (2) Shower Rooms with equal number for each gender i.e. Ladies and Gents, one unit either side is reserved and fitted for children. The allocated number of toilets in each Ablution Block ensures provision of sufficient service levels for the target population. It is estimated that on average, a user spends 5 minutes in the facility. Thus, for a single facility with 6 toilets and 10 hours of operation in a day, a maximum number of 960 persons can be served in a day.

Each section (ladies and gents) is provided with a toilet fitted with special amenities for use by disabled persons. The “Gents” are provided with separate urinals to increase the service levels especially during the peak hours.

The shower rooms are equipped with a dressing area and hand-wash basins. In addition, a spacious common area with hand-wash basins, hand driers and wall mounted mirrors is provided.

Each of the shower units is fitted with coat hangers behind the doors for convenience. To enhance natural lighting within the facility, transparent polycarbonate roofing material have been incorporated in the design. Proper ventilation is ensured by the louvered windows and gap between the ring beam and the roof. The gap is fitted with louvre blocks and plastic-coated coffee tray wires to prevent insect entry.



A septic tank with a holding capacity of 16 m<sup>3</sup> is provided at the facility for storage and partial treatment of sewage. The septic tank will require desludging after every 3 months with septage discharged into the collection manhole to be conveyed to the waste stabilization ponds. In addition, a 5,000-litre water tank mounted on a 3.5m high reinforced concrete tower within the facility provides a 3-day storage of potable water.

Other services provided at the site include; electricity for use at night and for security lighting, controlled access through 4 m wide metallic gate and boundary chain link fence where applicable.

Permission to use the facility is to be on a pay-per-use basis. This is an effective model used in many parts of the country to raise money required for operation and maintenance. A personnel office completes with a shop for essential commodities and a storage room shall be provided at the entrance of the facility with grilled opening for ease of payment before use.

A typical Site Layout Plan of the proposed Ablution Block are given in Figure below.

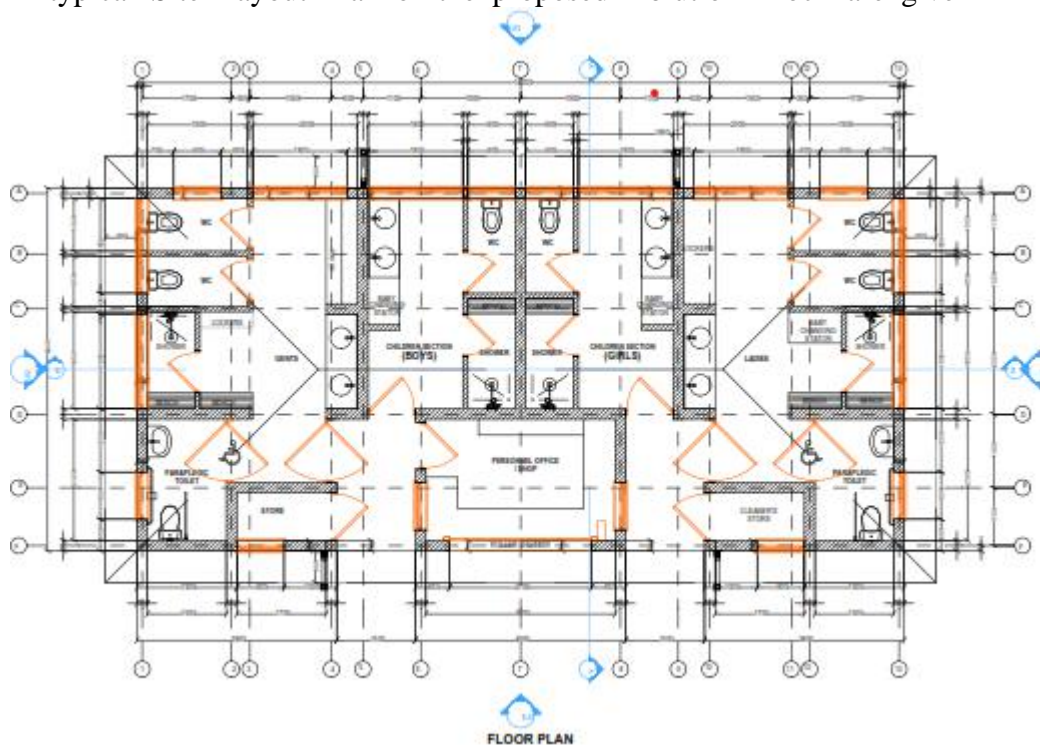


Figure 2-3: A typical Ablution Block Layout Plan

## 2.2.9 Projected Wastewater Flows

The total wastewater generated within a service area is determined by the wastewater generated from the water consumed (sewage contribution factor of 80%), infiltration into the sewers and splash flows.

Based upon the above components and assuming a regular / unsuppressed water supply and full water distribution network, the projected wastewater generation for the Namanga Town has been determined and is given in table below;

Table 2-4: Projected Wastewater Generation up to Year 2046

Detail	Unit	Rate	Demand in m <sup>3</sup> /d		1.47%
			2026	2036	2046
Domestic Demand			2,071.67	2,397.49	2,774.55
<b>Institutional Water Demand</b>					
Education	L/h/d	50	215.80	249.74	289.02
Hospital (Inpatient)	l/bed/d	420	0.45	0.52	0.61
Dispensary and Health Centre	l/disp/d	5000	26.89	31.12	36.02
Small Lodging Hotels (Avg 25beds)	l/bed/d	300	3.23	3.73	4.32
High Class Hotel (Avg 40beds)	l/bed/d	600	2.58	2.99	3.46
Commercial Entities	l/shop/d	100	11.83	13.69	15.85
Administrative offices	L/h/d	25	0.40	0.47	0.54
Industry	l/ha/d	20000	100.00	115.73	133.93
<b>Total Institutional Water Demands</b>			<b>361</b>	<b>418</b>	<b>484</b>
<b>Total Water demand</b>			<b>2,433</b>	<b>2,815</b>	<b>3,258</b>
Sewer Generated	80%		1,946	2,252	2,607
Add 15% Infiltration	15%		292	338	391
<b>Total Flow available for Treatment</b>			<b>2,238</b>	<b>2,590</b>	<b>2,998</b>

### 2.3 Project Classification

According to the Environmental Management and Coordination Act, No. 8 of 1999, projects should be classified as either Low Risk Project, Medium Risk Project or a High Risk Project. An analysis of the Namanga Sanitation Project as per the Second Schedule of the EMCA Act shows that the project will be classified as a Medium Risk Project.



## **2.4 Total Project Cost**

The total project cost for the proposed project is estimated at four hundred and sixty-four million, three hundred and fifty-eight thousand, four hundred and ninety-three Kenya shillings (KES464,358,493).



### 3 POLICY, LEGAL AND REGULATORY FRAMEWORK

#### 3.1 Introduction

##### 3.1.1 The Constitution of Kenya

The constitution of Kenya 2010 provides that every citizen has ‘a right to a clean and healthy environment’. It provides that development should be sustainable to preserve the environment for both the present and future generations under article 42 of the bill of rights. Chapter 5 of the constitution addresses sustainability issues around Land and environment. Part 1 of this chapter is devoted to equity and sustainability issues of land where it is a requirement that land be utilized ‘in a manner that is equitable, efficient, productive and sustainable.’

On the other hand, Part 2 of chapter 5 focuses on the conservation and protection of environment and natural resources as outlined in article 69. The article provides that the government have the obligation to:

- a) Ensure public participation in the management, conservation and protection of the environmental and natural resources
- b) Conserve genetic resources and other biodiversity
- c) Institute environmental and Social Impact Assessments and audits systems
- d) Reduce activities and processes that pose a danger to the environment
- e) Exploit the environment and natural resources in an approach that benefits the people of Kenya

Further, it is worth noting that article 70 of the constitution provides for redress in a court of law if they that allege that their right to a clean and healthy environment provided for under article 42 is violated. It is therefore important that the proposed project is implemented in compliance with the highlighted sections of the constitution of Kenya. *The project should ensure active participation of the public to consider their views in project implementation and the public have the right to seek legal redress if they believe that their right was violated. This project aligns to these provisions through the environmental and social assessment which is anchored on the principles of participation, equity, transparency among others*

##### 3.1.2 The Kenyan Vision 2030

The Kenya Vision 2030 is a policy document outlining Kenya’s development programme covering the period between the years 2008 to the year 2030. The objective of Vision 2030 is to help transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens in a clean and secure environment by 2030. Additionally, the Kenya Vision 2030 also has environmental goals outlined under the social pillar. According to the pillar, Kenya aims to be a clean, safe and sustainable environment by 2030. *In line with this, this environmental impact assessment aims to ensure that the proposed project enhances the inherent benefits of the project-improved sanitation and public health in Namanga-and devices measures to mitigate against possible negative social and environmental impacts. The resultant ESMP will contribute to the progressive realization of a clean environment by 2030.*

### **3.1.3 National Environment Policy**

The National Environment policy revised in 2012 puts in place guidelines on sustainable management and utilization of natural resources in the country. It seeks to protect and conserve nature from the increasing pressure from human activities. The policy seeks to develop an integrated approach to environmental management and strengthen the legal and institutional structures for effective coordination and promotion of environmental management. *The proposed project shall develop and implement an Environment and Social Management and monitoring plan in accordance to mitigate identified significance impacts of the project. The plan will ensure that susceptible ecosystems are protected from during project implementation and after its completion*

### **3.1.4 National Policy on Water Resources Management and Development**

While the national Policy on Water Resources Management and Development (1999) enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. It, therefore, calls for development of appropriate sanitation systems to protect people's health and water resources from institution pollution. Industrial development projects, therefore, should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating there from.

The same policy requires that such projects should also undergo comprehensive EIA/EA that will provide sustainable measures to be taken to ensure environmental resources and peoples' health in the immediate neighbourhood and further downstream are not negatively impacted by the emissions.

In addition, the policy provides for charging levies on wastewater on quantity and quality (similar to polluter-pays-principle) in which those contaminating water are required to meet the appropriate cost on remediation, though the necessary mechanisms for the implementation of this principle have not been fully established under the relevant Acts. However, the policy provides for establishment of standards to protect water bodies receiving wastewater, a process that is ongoing.

*An environmental management plan will be developed to provide mechanisms for safeguarding the environment and particularly ensuring the treated waste water from the treatment plant meets the standard requirement*

### **3.1.5 Policy Guidelines on Environment and Development**

Among the key objectives of the Policy Paper on Environment and Development (Sessional Paper No.6 of 1999) are: -

- a) To ensure that from the onset, all development policies, programmes and projects take environmental considerations into account,
- b) To ensure that an independent environmental impact assessment (EIA) report is prepared for any industrial venture or other development before implementation,
- c) To come up with effluent treatment standards this will conform to acceptable health standards.

Under this paper, broad categories of development issues were covered that require sustainable approach these issues include the waste management and human settlement sectors. The policy recommended the need for enhanced re-use/recycling of residues including wastewater, non-waste technologies, increased public awareness raising and appreciation of clean environment. It also encourages participation of stakeholders in the management of wastes within their localities.

### **3.1.6 Sustainable Development Goals**

Goal number eleven of the global sustainable development goals, talks of making cities inclusive, safe, resilient and sustainable. Some of the goal's targets which are relevant to the project include: to ensure access for all to; adequate, safe and affordable housing and basic services and upgrade slums by 2030 and to enhance inclusive and sustainable urbanization and capacity for sustainable human settlement planning in all countries by 2030.

*The project will directly contribute towards sustainability of Namanga Town and the surrounding towns. The project will be implemented in consideration of environmental principles.*

## **3.2 Sanitation Policy and Regulatory Framework**

### **3.2.1 Public Health Act (Cap. 242)**

This Act provides for conditional securing of health and safety while undertaking development activities. Part IX of this Act on Sanitation and Housing is concerned with protection of public health by providing that no individual should encounter health problems and insecurity as a result of any development. The County has the obligation to ensure that no development activities in their jurisdiction pose a danger to people and the environment. The proposed project is founded and guided by this Act as it seeks to reduce wastewater emissions and other waste, which pose a danger to human health and environmental integrity. The proponent will also ensure that the proposed project will have no leakages that might result to offensive emissions, smell and water from the projects.

The Act comprehensively ensures that safety and health are upheld during development and projects set up facilities that are secure which the proponent will abide by. The Public Health (Drainage and Latrine) Rules Rule 85 provides that every owner or occupier of every workshop, workplace or other premises where persons are employed shall provide proper and sufficient latrines for use by employees. Rule 87 requires every contractor, builder or other person employing workmen for the demolition, construction, reconstruction or alteration of any building or other work in any way connected with building to provide in an approved position sufficient and convenient temporary latrines for use by such workmen. Rule 91 provides that no person shall construct a latrine in connection with a building other than a water closet or a urinal, where any part of the site of such building is within 200 feet of a sewer belonging to the local authority which is at a suitable level, and where there is sufficient water supply.

*The EMP will provide measures to safeguard the health and safety of the community living around the project area during construction and operation phase.*

### 3.2.2 Water Act, 2016

The Water Act No. 8 of 2016 provides for the management, conservation, use and control of water resources and for acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services. Section 18 of this Act provides for national monitoring and information systems on water resources. Following on this, sub section 3 mandates the Water Resources Authority (WRA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may require to be kept by a site operator and the information thereof furnished to the authority.

Section 73 of the Act provides that a person who is licensed to supply water has a responsibility of safeguarding the water sources against degradation. According to section 75 (1) such a person is required 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 pollution of water sources within his/her jurisdiction. Section 94 of the Act also makes it an offence to 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 water resource in such a manner as to cause, or be likely to cause, pollution of the water resource.

*The proposed project will provide measures that ensure that ensure raw sewer is not directed into rivers or does not pollute existing water sources. Treated sewer will meet the required standards before it is drained into the river.*

### 3.2.3 Water Quality Regulations, 2006, (Legal Notice No.121)

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.

No person is allowed to abstract water from a natural water body for domestic purposes unless such water meets the standards set out in the First Schedule.

These regulations provide for the protection of lakes, rivers, streams springs, wells and other sources. The overriding objective of the regulations is to protect human health and the environment. Proper enforcement of the regulations can lead to marked reduction in water-borne diseases. The regulations provide guidelines and standards for the discharge of poisons, toxins, radioactive and other pollutants into the aquatic environment. Standards have also been set for discharge of effluent into the sewer and aquatic environment. The National Environment Management Authority regulates discharge into the aquatic environment.

Persons (real or legal) discharging effluent into the environment are required to submit quarterly discharge monitoring records to NEMA.

### 3.2.4 Kajiado County Water Sector and Sanitation Policy, 2019

The water sector and sanitation policy seek to guide the County Government of Kajiado on how to develop and implement an effective water services and sewerage system where there is guaranteed clean and safe water for all. It further provides a framework for sustainable and equitable development of water resources through promotion of good governance of affordable supply and sanitation in the county. The policy intends to coordinate stakeholders in the water and sanitation sector, develop and implement a legal framework to aid delivery of water and



sewerage services, ensure enhanced delivery of sewerage services and the inclusion of rural population in the delivery of water and sewerage services in the county.

*The proposed project is aligned to this policy as it seeks to provide sanitation services. The development process incorporates the principles highlighted in this policy: good governance, sustainability and equity. It has allowed for a broad stakeholder involvement in designing the project and identifying environmental and social impacts.*

### **3.3 Environmental Policy and Regulatory Framework**

#### **3.3.1 National Environment Action Plan Framework**

The National Environmental Action Plan Framework is the second national environmental policy after the 1994 National Environmental Action Plan (NEAP). The development of NEAP is provided for by EMC (amendment) Act 2015 which requires preparation of Environmental Action Plan at different levels; County and national levels. The framework recognizes the intertwined linkages between economic growth and environment in Kenya. It highlights priority themes and activities for the country towards achieving sustainable environment.

#### **3.3.2 Environment Management & Coordination Act Cap 387**

This Act of Parliament, EMCA 1999 and the subsequent amendments, is the parent Act of Parliament that provides for the establishment of appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto.

EMCA, in its 13 interrelated parts, provides regulatory provisions for all levels of environmental conservation and management. The first one part provides legislative guidelines on administrative and planning components of environmental management. They include; (I); General principles (II); Administration (III); Environmental planning (IV); Protection and Conservation of the Environment. Parts five to seven focus on on-field management of the environment as an integral component of actual or proposed projects. (V), Environmental impact assessments (EIA), audits and monitoring (VI); Environmental audit and monitoring (VII); Environmental quality standards. The last five parts of the Act regulate on enforcement of provisions outlined in the Act and recognition of international agreements along which the EMC (amendment) Act 2015 has been established. They are; (VIII); Environmental Restoration orders, Environmental Easements (IX); Inspection, analysis and records (IX); Inspection Analysis and Records (X); International Treaties, Conventions and Agreements (XI) National Environment Tribunal (XII); Environmental Offences (XIII).

All the chapters 1 to 13 apply to the proposed project at one stage or the other and therefore the project proponent is required to understand and conform with the Act accordingly. One such area is Environmental and Socio Impact Assessment. This is expressly stated in section 58(2) of the Act.

#### **3.3.3 The Environmental (Impact Assessment and Audit) Regulations, 2003/Legal Notice 31 & 32**

This is a supplementary legislation to the EMC (amendment) Act. It gives additional punch by providing guidelines for conducting Environmental Impact Assessments and Audits. It offers guidance on the fundamental aspects on which emphasis must be laid during field study and outlines the nature and structure of Environmental Impact Assessments and Audit reports. The



legislation further explains the legal consequences of partial or non-compliance to the provisions of the Act.

The Legal Notice 31 & 32 categorizes the proposed sanitation project as a high-risk one that requires a comprehensive study. This implies undertaking a detailed assessment of site conditions, extensive public participation and broad stakeholder engagement.

### **3.3.4 Environmental Management and Coordination (Conservation of Biological Diversity) Regulations 2006**

These regulations are described in Legal Notice No. 160 of the Kenya Gazette Supplement No. 84 of December 2006. These Regulations apply to conservation of biodiversity that includes Conservation of threatened species, inventory and monitoring of biological diversity and protection of environmentally significant areas, access to genetic resources, benefit sharing and offences and penalties. This legislation takes cognizance of the need to promote the integrity of biodiversity to promote their integrity. Most of the biological diversity is highly threatened by development in the current world and there is an apparent need to enhance their integrity. Section IV, prohibits any activity, which may have adverse effects on the ecosystem.

### **3.3.5 Environmental Management and Coordination (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulations 2009**

These regulations provide for the protection, management of wetlands, riverbanks, lakeshores, seashore management, and detail guidelines on the same.

### **3.3.6 Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007**

These Regulations aim to regulate the production, trade and use of controlled substances and products; provide for a system of data collection to facilitate compliance with relevant reporting requirements under the Montreal Protocol on Substances that Deplete the Ozone Layer; promote the use of ozone friendly substances, products, equipment and technology; and ensure the elimination of substances and products that deplete the ozone layer.

### **3.3.7 Environmental Management and Co-ordination (Waste Management) Regulations, 2006**

Regulations guiding waste management are described in Legal Notice No. 121 of the Kenya Gazette Supplement No. 69 of September 2006. They offer legal provisions on handling of a variety of wastes emanating from various projects and activities. The waste categories covered by the regulations include:

- Industrial waste
- Hazardous and toxic wastes
- Pesticides and toxic substances
- Biomedical wastes
- Radio-active substances

These Regulations outline requirements for handling, storing, transporting, and treatment / disposal of all waste categories as provided therein. Part V section 34 requires that pesticides or toxic substances be disposed at designated site or plant approved by the authority.

### **3.3.8 Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations 2006**

These regulations are described in Legal Notice No. 131 of the Kenya Gazette Supplement No. 74 of October 2006 and will apply to all internal combustion engine emission standards, emission inspections, the power of emission inspectors, fuel catalysts, licensing to treat fuel, cost of clearing pollution and partnerships to control fossil fuel emissions.

### **3.3.9 Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Control Regulations, 2009**

This is covered under the legal notice number 61. These Regulations under part II section 3 prohibit making or causing any loud, unreasonable, unnecessary or unusual noise, which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.

Section 4 prohibits excessive vibrations and excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or excessive vibrations which exceed 0.5 centimetres per second beyond any source property boundary or 30 meters from any moving source;

Operations of machineries that produce excessive noise are also prohibited under section 11 including; Operating or repair of any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air-conditioning apparatus or similar mechanical device; or engaging in any commercial or industrial activity, which is likely to emit noise or excessive vibrations that exceed the levels prescribed in the First Schedule (See annex) to these Regulations.

The legal notice also prohibit construction at night except for the purposes specified in sub-Regulation (2) which include roads and other public utilities. Section 15 calls for an Environmental Impact Assessment to be carried out by any person intending to carryout construction, demolition, mining or quarrying work to do an Environmental Impact Assessment studies to identify natural resources, land uses or activities which may be affected by noise or excessive vibrations from the construction, demolition, mining or quarrying;

Determine the measures that are needed in the plans and specifications to minimize or eliminate adverse construction, demolition, mining or quarrying noise or vibration impacts; and incorporate the needed abatement measures in the plans and specifications.

## 4 BASELINE CONDITIONS

### 4.1 General Overview

The proposed project is located in Kajiado County. The county is located in the Southern part of the Kenya. It borders counties of Nairobi to the North East, Narok to the West, Nakuru and Kiambu to the North, Taita Taveta to the South East, Machakos and Makueni to North East and East respectively. The proposed project area is in Namanga, a small town located in the border of Kenya and Tanzania. The exact coordinates of its location are 2°32'22.2"S, 36°47'49.6"E), (2°32' 22"S, 36°47'50"E), (2°32'25"S, 36°47'51"E), (3°32'25"S, (36°47'50"E).

### 4.2 Physical Environment

#### 4.2.1 Climatic Conditions

The proposed project area lies in the semi-arid lands of Kenya categorized as Agro Ecological Zone V. The distribution of the rainfall is bimodal received in two rain seasons. The short rains fall between October and December while the long rains fall between March and May. Generally, sections of the county that experience heavy rains include: Ngong Hills, Chyulu Hills, Nguruman escarpment and the foothills of Mt. Kilimanjaro. This is because the rainfall in the district is strongly influenced by altitude. The temperatures in the county also vary according to altitude. Mean maximum of 34°C around L. Magadi and a mean minimum of 10°C on the foothills of Kilimanjaro have been recorded. Moisture deficit is also observed in the greater part of the year. This gives the area a dry season of between 7-9 months. The climate scenario indicates that other than the Nguruman area where heavy rains are experienced, Namanga Town generally receives low rainfall. The proposed project will therefore not be at risk from frequent flooding due to heavy rains.

#### 4.2.2 Hydrology

The greater part of the county depends on ground water reserves. Limited surface water resources exist for livestock and domestic use. The major rivers in the area include; Athi, Ewaso Ngiro, Olkejuado and Nooltresh. In this case construction of water dams and pans, boreholes and shallow wells are important means of accessing water. Ground water yields vary throughout the district from 0.01 to 35.77 cubic metres per hour. This larger project for which this ESIA is being undertaken provides a dam and water reticulation component which will increase water access. There is a seasonal stream in the project area (Ormankeki stream) where the treated effluent will be directed.





Plate 4-1: Ormankeki stream during the dry season

#### 4.2.3 Soils

The soil and rock structure in the county come in three geological regions namely Quaternary volcanic, Pleistocene and Basement rock soils. River valleys and parts of the plains are dominated with basement rock system, which consist mainly gneisses, cists, quartzite and crystalline limestone. The inland lake drainage system is especially around Lake Amboseli is largely underlain with Pleistocene soils and quaternary volcanic soils are found mainly in the Rift Valley region. Soil type is one aspect alongside altitude and rainfall in determining vegetation type in the area. Soils are well drained; shallow to moderately deep, brown to dark brown, firm and slightly smeary, strongly calcareous, stony to gravelly clay loam, in many places' saline and/or sodic soils and with inclusions of lava fields (Ando-calcaric Regosols, partly lithic phase).

### 4.3 Biological Environment

#### 4.3.1 Flora and Fauna

The main vegetation type in the project area is determined by altitude, soil type and rainfall received in the different parts of Namanga. However, anthropogenic and animal causes have modified the status significantly. Overgrazing, charcoal burning, extraction of fuel wood, forest fires and quarrying activities are some of the leading causes of this trend. Ground cover varies according to seasons while the canopy cover ranges from 1% on the densely populated areas to 30% on the steep slopes. The main vegetation types comprise wooded grassland, open grassland, wooded bush land, bushed grassland and forest (Ol-donyorok). Woody species include; *Acacia tortilis*, *Acacia xanthopholea*, *Acacia mellifera*, *Commifora schemperi*, *Balanites aegyptiaca*, *Balanites gabra*, and *Salvadora persica*. Grasses include; *Pennisetum mezianum*, *Pennisetum stramineum*, *Chloris roxburghiana* and *sporobulus angustifolia*, *Chloris guyana* and *Cenchrus ciliaris*. The vegetation on the proposed site will be cleared to allow for development of the treatment plant and the laying of sewer lines.







Plate 4-2: Characteristic flora in the project area

## 4.4 Socio-economic environment

### 4.4.1 Demographic characteristics

According to the 2019 Kenya Population and Housing Census, Kajiado County has a total population of 1,117,840 where males are 557,098 and females are 560,704. During the Census, the project area was under Kajiado Central Sub-County. However, in 2020, the Government of Kenya created a new Sub County, Oloililai Sub County to serve the residents of Ng'ataack, Maili Tisa, Torosei, and Namanga Towns. This implies that the project area now lies in Oloililai Sub-County.

The table below shows the population distribution in each location and sub-location within the project area and depending on which project component.

Table 4-1: Demographic characteristics within the project area

Project Component	Location	Sub-Location	Male	Female	Total
Sewerage system	Namanga	Namanga	7917	7669	15586
		Oloolarui	2294	2196	4490

### 4.4.2 Land Ownership

In the county, land ownership is classified into three namely communal, private, and public land. Most of the land is registered either as leasehold or freehold interest. An estimated 95 percent and 5 percent of land in rural and urban areas is registered and titled respectively. The mean land holding size in the county stands at nine (9) Ha in small scale and 70 Ha on large scale. The land where the sewer treatment plant will be constructed is privately owned. The owner will be compensated at the market value based on the valuers report. Other areas where sewer lines will pass through private land will also be compensated.





#### **4.4.3 Land use**

The county is dominated with livestock farming by the *Maasai* community practicing pastoralism. Small to medium scale farming is practiced in high potentials areas of Ngong, Loitokitok, and Nguruman while large-scale flower farming is practiced in Kitengela and Isinya areas. The county is experiencing rapid urban development that include industrial and housing developments which is spread across the county with increased sub-division and fragmentation of agricultural land affecting rural livelihood sustainability. The predominant land use in Namanga Town is commercial use but small scale farming is practiced in the peri urban zones. There are a number of small scale farmers practicing irrigated farming around the proposed project area.

#### **4.4.4 Education**

The project area has around 12 learning institutions where ten are primary schools and three are secondary schools. One rescue centre is located along the Namanga-Nairobi Highway. Out of this, the percentage of boys who have enrolled in the school is higher than that of the girls. The transition from primary to secondary schools is also high among the boys than the girls. This is attributed to issues such as early marriages and Female Genital Mutilation. The proposed STP neighbours a school Savelberg mixed day and boarding school. This study will provide measures to ensure the project activities do not affect the learning environment in the school.

#### **4.4.5 Infrastructure**

##### **4.4.5.1 Health**

There are 4 sub county hospitals namely Kajiado, Loitokitok, Ngong and Kitengela, 17 health centres and 78 dispensaries under by the county government. There are also 6 hospitals, 13 nursing homes, 7 health centres, 27 dispensaries and 101 clinics, which are either managed by private, faith based, community based and other non-government organizations. The county has 92-community health units initiated out of which only 78 are active. The doctor population ratio is 1:26,094, Public Health Staff is 1: 7,619, and the nurse population ratio is 1: 1,068. The average distance to a health facility is 14.3 Km against the 5 Km recommended by WHO with only 9.9 percent of the population within a distance of less than a Kilometer to a health facility.

##### **4.4.5.2 Transport System**

The county is linked up to various centres within and around the county through five (5) major roads, Standard Gauge Railway (SGR) and 7 airstrips. The five major tarmac roads are Emali-Loitokitok, Namanga-Kitengela, Isinya-Kiserian, Magadi-Mbagathi and Kiserian-Ngong. The SGR passes through the parts of Kajiado East and North with a terminus at Emali that facilitates transportation of soda ash and offering commuter services in the area. At least each sub-county in the county is served with an airstrip in Kajiado town, Loitokitok, Olooloitikosh, Ngong, Magadi, Daraja and Amboseli National Park. The project is served by the Nairobi-Namanga road and an access road approximately 8 KM from Namanga Town.



*Plate 4-3: Access road connecting the Namanga-Nairobi highway to the proposed STP site*

#### **4.4.5.3 Energy Access**

Kajiado County is regarded as the frontier counties in developing green energy with Ngong hills wind power contributing the national power grid with a capacity of 25.5 MW. Green energy such as wind, biogas, and solar are envisioned to be of great potential in the county. Electricity, solar, lantern and tin lamp are the major sources of lighting in the county. An estimated 39.8 percent of households use electricity, 39.8 and 18.9 percent of households use tin lamp and lantern respectively. About 94.6 and 74.5 percent use paraffin, firewood and charcoal in rural and urban areas respectively. Liquefied Petroleum Gas (LPG) and electricity is common for cooking in urban areas with an estimated 21.4 and 2.0 percent of households respectively. The proposed STP is served with electricity.

#### **4.4.5.4 Economic Activities**

The labour force in the county is projected at 624, 184 with agriculture, manufacturing, construction, and transport sectors being the major employers. An estimated 40 percent of the population is self-employed in Micro, Small and Medium Enterprises while the public sector is reported to employ 0.7 percent of the total population. On the other hand, unemployment rate in the county stand at 9.7 percent slightly lower than the national rate at 11 percent. In addition, a large population engage in livestock trade, retail and wholesale trade, horticultural and floriculture, industrial activities, Jua kali, and tourism sector – tour guide and sale of cultural artefacts and beads.

#### **4.4.5.5 Sanitation**

Sanitation distribution in rural areas is low at 26 percent and 47 percent in urban areas accessing toilets/latrines. The county lacks a sewerage connection system and residents rely on ineffective methods of waste management such as urine diverting toilets and septic tanks. There



is no sewer treatment plant in the county and therefore pit empties/exhaust vehicles have to transport the waste to Ruai waste treatment plant in Nairobi. The situation is expected to worsen with the rapid urbanization that will increase effluent discharge. The county has seven dumpsites in Kajiado, Kitengela, Bissil, Ngong, Loitokitok, Mashuuru and Isinya. There are 8 trucks that aid waste management in the county alongside several private investors that collect garbage from homesteads at a fee. The proposed project will address one of the major sanitation challenges by providing sewerage infrastructure in Namanga Town.

## 5 STAKEHOLDER ENGAGEMENT

### 5.1 Introduction

Stakeholder engagement is a critical process in a project as it significantly influences the project's success. Stakeholders in this report refers to person (s) who has an interest or can either affect or be affected by the project. It is important to undertake effective consultation with stakeholders from the project inception to closure.

In this project, stakeholders were mapped out as either primary or secondary. They were then analysed based on their impact, level of influence, importance to the project, and contribution to the project. This helped in determining the best strategy for engaging with them. It then concludes with a summary of the feedback obtained from the stakeholders that is reviewed and incorporated in the final design, construction and operation of the project.

### 5.2 Objectives of Stakeholder Engagement

Stakeholder engagement has the following objectives:

- **Inform:** Provide accurate, relevant, timely and culturally appropriate information to Project stakeholders about the Project, its impacts and benefits, and the ESIA process.
- **Engage:** Provide opportunities for Project stakeholders to express their opinions and concerns about the Project, and to seek broad stakeholder support for the Project and impact management
- **Understand:** Enable the Project team to understand the concerns and priorities of stakeholders
- **Review:** Incorporate justified concerns and priorities into the design, construction and operation of the Project
- **Inform (feedback):** Provide feedback to Project stakeholders and host communities as the Project develops so that the consultation process continues.

### 5.3 Stakeholder Mapping

Mapping of stakeholders is an essential process that assists the expert in understanding whom they need to prioritize in their engagement. The following stakeholders have been identified as persons who will be affected by the project or who could influence the project's success. They are mapped as either:

- Primary Stakeholders-** Those who hold a direct interest in the proposed project
- Secondary Stakeholders-** Those with an indirect interest, but they can influence the project's success.

They are mapped as shown in the table below:

Table 5-1: Mapping of Stakeholders

Primary Stakeholders	Secondary Stakeholders
<ul style="list-style-type: none"> <li>• Project Affected Persons</li> <li>• Hosting community at the Proposed Dam area (Enkokidong'oi Village-Maili Tisa Town) and at the Waste Water Treatment Plant (specific location to be determined)</li> <li>• Kenya Forest Services</li> <li>• Kenya Wildlife Services</li> <li>• Neighbours along the project area</li> <li>• Ol Doinyo Orok Water &amp; Sewerage Company (OLWASCO) &amp; Olkejuado Water &amp; Sanitation Company (OWASCO)</li> <li>• Client (Implementing Agency) - Tanathi Water Works Development Agency Client (TAWWDA)</li> </ul>	<ul style="list-style-type: none"> <li>• County Government of Kajiado</li> <li>• CECM (Water, Irrigation, Environment &amp; Natural Resources)</li> <li>• CECM (Lands, Physical Planning &amp; Urban Development)</li> </ul>
	<ul style="list-style-type: none"> <li>• National Land Commission (NLC)</li> <li>• National Environment Management Authority (NEMA)</li> <li>• Water Resource Authority (WRA)</li> <li>• Water Resources Users (WRUA)</li> <li>• NGOs / CBOs</li> <li>• Institutions within the area (Schools, Hospitals, Churches etc.)</li> </ul>
	<p>Political class</p> <ul style="list-style-type: none"> <li>• Member of Parliament</li> <li>• MCA</li> <li>• Ward Administrator</li> </ul>
	<p>Local Administration</p> <ul style="list-style-type: none"> <li>• County Commissioner –Kajiado County</li> <li>• Deputy County Commissioner –Oloililai Sub County</li> <li>• Assistant County Commissioners- Oloililai Sub County</li> <li>• Chiefs and their Assistants</li> </ul>





## 5.4 Stakeholder Analysis

Table 5-2: Analysis of project stakeholders

Stakeholder Name	Impact (Low, Medium, High)	Influence (Low, Medium, High)	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project?	Strategy for engaging the stakeholder
<b>TAWWDA</b>	High	High	Improve the existing water and sanitation system and meet the water demands in line with Vision 2030	By providing funds for undertaking the project	Blocking the funds	Regular status report, monthly reports and other deliverables
<b>OLWASCO</b>	High	Low	Obtaining water to supply to the public and providing a sewer reticulation and treatment system particularly for the growing urban population	Communicate with other stakeholders to express their support for the project	Making complaints about quality of service after the reports	Information and feedback meetings every 6 months
<b>OWASCO</b>	High	Low	Obtaining Water to supply to the public	Communicate with other stakeholders to express their support for the project	Printing stories that oppose the new reforms	Quarterly progress meetings
<b>Ormankeki Village (Proposed WWTP) Residents,</b>	High	High	Understanding how the project safeguards their safety and health as the host community, in case of displacement, how	By sharing their concerns, opinions about the project from the design stage.	Reject the project by refusing to be displaced	Create project awareness and provide an open communication to ensure they understand the project well. Their



Stakeholder Name	Impact (Low, Medium, High)	Influence (Low, Medium, High)	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project?	Strategy for engaging the stakeholder
<i>farmers, school, church</i>			resettlement will be undertaken.			engagement shall be ongoing throughout the project cycle
<b>County Government of Kajiado-Department of Water</b>	High	Low	Ensuring consistent water supply and sanitation needs in the county are met.	By sharing relevant information on proposed project with the Client/Consultant.  Assist in the creation of project awareness and promoting acceptance	_____	Through KII and Focused Group Discussions. Consultant sharing their findings with the County.
<b>NLC</b>	High	Low	Ensuring they acquire the land needed for the project implementation on behalf of the Government	Inform the affected stakeholders of the acquisition process during the disclosure stage	_____	The client to officially communicate to the County Coordinator and Director of Valuation when the acquisition process needs to be initiated
<b>NEMA</b>	High	High	Adequate Environmental and Social Impact Assessment is undertaken	By availing the ESIA report for review and licensing	By not issuing EIA License	Providing ESIA Report and all other necessary documentation regarding the project for review



Stakeholder Name	Impact (Low, Medium, High)	Influence (Low, Medium, High)	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project?	Strategy for engaging the stakeholder
			before the project construction			
<b>WRA &amp; WRUA</b>	High	High	Proper disposal of treated effluent/ Ensuring effluent discharged meets the recommended standards to prevent contamination of surface water	By sharing relevant information of the water resources that will be affected by the project. Link the consultant with the WRUA of the project area	By not issuing WRA permits required for water abstraction	Consulting with the stakeholder during the design stage and providing the relevant reports needed for issuing of permits.
<b>Politicians (MCA, Ward Administrators, MP etc.)</b>	Low	High	The residents within their area of jurisdiction access and enjoy amenities like water and proper sanitation	Creating awareness about the project in order to obtain support and project acceptance		Involving them in focused group discussions and public stakeholder meetings
<b>Local Administration (CC, DCC, ACC, Chiefs &amp; Assistant Chiefs)</b>	Low	High	Law and order are adhered to during the project implementation phases	Help in organization of local meetings, sharing relevant information about the project area, assist in identifying the affected land owners,		Involving them in KII, focused group discussions and public stakeholder meetings.  Communicating all findings during each step of the project.



Stakeholder Name	Impact (Low, Medium, High)	Influence (Low, Medium, High)	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project?	Strategy for engaging the stakeholder
				Help in resolution of any complaints that may arise during the project implementation phase.		Head the Grievance Redress committee once they are set up



## 5.5 Stakeholder Engagement Approach

Stakeholder engagement process is a crucial process in the undertaking of any project. The interaction is aimed at creating awareness, obtaining their views/opinions and concerns about the project.

Table 5-3: Methodology adopted in Stakeholder Engagement

Technique	Target Group	Objective	Date Undertaken
Key Stakeholder Interviews	Secondary Stakeholders <ul style="list-style-type: none"> <li>County Government of Kajiado-CEC Water, Environment, Natural Resources</li> <li>KFS</li> <li>NEMA</li> <li>KWS</li> <li>WRA</li> <li>Local Administration (DCC-Ngatataek Sub County, ACC, Chiefs &amp; Assistant Chiefs)</li> </ul>	<ul style="list-style-type: none"> <li>To create awareness about the project</li> <li>To obtain their views regarding the project</li> </ul>	3/11/2021-5/11/2021
Public Entry Meeting	<ul style="list-style-type: none"> <li>Residents within the project area</li> </ul>	<ul style="list-style-type: none"> <li>To create awareness about the project</li> <li>To inform them about the upcoming field work activities to be undertaken by the Consultant</li> </ul>	17/11/2021 & 19/11/2021
Household Surveys	<ul style="list-style-type: none"> <li>Residents within the project area</li> </ul>	<ul style="list-style-type: none"> <li>To understand the socio-economic status of the affected communities</li> </ul>	To be undertaken
Focused Group Discussion	Key stakeholders	<ul style="list-style-type: none"> <li>To obtain their input on the proposed design</li> </ul>	To be undertaken
Asset inventory	Project Affected Persons	<ul style="list-style-type: none"> <li>To take an inventory of all assets that will be displaced by the project for purposes of budgeting</li> </ul>	To be undertaken
Public Consultation and disclosure Meeting	<ul style="list-style-type: none"> <li>Residents within the project area</li> </ul>	To obtain their views/opinions/concerns about the developed design	To be undertaken



Technique	Target Group	Objective	Date Undertaken
Compensation/ resettlement meeting	<ul style="list-style-type: none"> <li>• Department of Water, Environment &amp; Climate Change</li> <li>• Project Affected Persons</li> <li>• Community (residents, community groups, institutions)</li> <li>• Local Administration (DCC Sub County, ACC, Chiefs &amp; Assistant Chiefs)</li> </ul>	<p>Provide information on compensation processes</p> <p>Discuss project impacts</p> <p>Address questions related to project design, location and beneficiaries</p>	3/4/2023- 5/4/2023

## 5.6 Summary of Feedback from the Secondary Stakeholders

The Consultant undertook Key Informant Interviews that targeted the Secondary Stakeholders from 3/11/2021 to 5/11/2021. The feedback from the stakeholders is summarized below:

### a) County Government of Kajiado- Department of Water

- Dam safety for both the local residents and the wild animals should be considered during the design and construction phases of the project
- The locals should be given first priority in job opportunities particularly for the casual labourers
- Consider putting up troughs and communal water points for livestock and community respectively
- There is need for the Water Service Providers and TAWWDA to ensure proper sensitization to the local community on the billing of water service
- The county should be involved in public meetings during the design phase and site meetings during the construction and supervision stage.
- The County would like to have an officer/staff as part of the Project Implementation Unit
- A Disaster Management Office that collaborates with the County Office should be established

### b) County Government of Kajiado- Department of Environment

- Urged the Consultant to conduct public participation in all the stages of the project
- Consider solar energy in areas where pumping is needed as its more sustainable
- Sand harvesting is a major source of livelihood and income for the County Government. Since it's an activity practised within the project area access how the project will affect the activity.
- Consultant to check on the land tenure of the proposed location for the construction of the Wastewater Treatment Plant (WWTP) because an area zoned as residential is prohibited from setting up of a WWTP.

### c) Local Administration

- Ensure the local authority is alerted whenever any activity is ongoing to ensure security especially of equipment



- Create awareness on compensation and land acquisition process to avoid conflicts
  - Consider alternative sources of energy such as solar to ensure consistent water supply in the area
  - Build trough points for livestock to access water
  - Ensure the dam is fenced to avoid cases of drowning
  - During construction, the contractors should work with the local authority
  - Casual work should be accorded to the local workers
- d) Ol Doinyo Orok Water and Sewerage Company Ltd (OLWASCO)-MD**
- Ensure adequate awareness and sensitization meetings about the project are held
  - Engage all relevant stakeholders to promote project ownership and support
  - Train the host community on the need and how to protect the project equipment from vandalism and destruction by animals
- e) Olkejuado Water and Sanitation Company Ltd (OWASCO)- MD**
- Ensure proper sensitization to the local community on the billing of water service is done
  - Boreholes are highly an unreliable source of water in the area; the dam will really help in boosting the situation.
- f) National Land Commission –County Coordinator**
- The client to officially communicate to the County Coordinator and Director of Valuation when the acquisition process needs to be initiated.
- g) Kenya Forest Service-Namanga Forest Station Manager**
- All reports on the Consultant's findings to be availed to the KFS offices
  - During the studies, KFS will be availing rangers to accompany the experts to the forest since there are wild animals.
  - An active Community Forest Association is in existence and they are involved in conserving the forest.



Plate 5-1: LEFT: Courtesy call at County Commissioner's office-Kajiado County. RIGHT: Courtesy call to CECM-Water Kajiado County





Plate 5-2: LEFT: Courtesy call at OLWASCO. RIGHT: Courtesy call at ACC's office Oloilai Sub-County

## 5.7 Summary of Feedback from the Public

The Consultant undertook Public Entry Meetings to create awareness about the project from 17/11/2021 to 19/11/2021. RAP Awareness meeting was done on 4<sup>th</sup> May 2023. The Client TAWWDA, representatives from OLWASCO, Area MCA and the Local Administration (ACC, Chiefs and Assistant Chiefs) were present in the meetings. The Consultant provided a brief of the project Scope, upcoming field activities then had a question and answer forum with the attendees. The team first met with the Opinion Leaders before conducting the public meetings. They are all supportive of the project as lack of water is a critical issue in the area. However, they had concerns that are summarised below. The minutes of the meetings are attached in the Appendix.

### 5.7.1 Feedback from Public

- *Employment opportunities*- The locals should be given first priority in the available job opportunities especially during construction. The locals should be hired as interns to ensure skills and knowledge are transferred.
- *Land Acquisition*- Forceful eviction should not be done. The affected persons should first be compensated using market rates. There should be no delays as in the past projects the affected persons failed to get their compensation.
- *Scope of Water Supply Areas*- Areas that may not be reached with the water connections to the residential areas, consider putting up water kiosks at common points to boost accessibility. Local community tend to clash over the resource particularly during the dry season.
- *Dam Safety* is a critical concern particularly among the residents leaving downstream of the proposed dam. Sensitive receptors such as Noontoto Primary School and First Baptist Church are also located downstream
- There are several *existing community water projects* that are likely to be affected by the proposed project. The consultant needs to ensure that the local community projects are well handled especially during construction phase. The community recommended that the pipelines should be relocated before construction commences.
- *Billing of Water*-The Community would not wish to be charged for the water provided for domestic use-The Consultant explained that billing was necessary as the funds are used for maintenance of the project and ensuring people access clean water. Besides, if no billing is done, the project may not be sustainable. The billing rates are set by WASREB.



- *Change in Title Deed to indicate an existing wayleave*, will it imply that the wayleave is no longer your land? Others were of the opinion that the wayleave should be left as public land- The Consultant explained that the wayleave will still be part of your land only that there are limited activities the owner can do on that section. For instance, no permanent structure should be constructed or planting of trees.
- *Impact of Sewerage Plant causing diseases like Cholera and issue of smell*- The WWTP is constructed in such a way that trees are planted to assist with the smell and is not located near a residential place. The raw sewer water will not mix with the clean water as they have separate pipelines. However, in case of spillage, OLWASCO has to be having routine checks and have a communication system where the public can alert them and repair immediately.
- *Rehabilitation of existing water projects in the area*- Yes, the existing water facilities will be rehabilitated.
- *Setting up a Health Facility*-Namanga has no public health facility. Residents have to travel to Bissil or access private clinics. As part of CSR activities consider establishing a health facility as cases of Malaria and other water associated diseases are likely to be on the rise once the project is implemented.



Plate 5-3: Stakeholder Consultation Meeting on 18/11/2021 at AIC Namanga Church Hall

## 5.8 Summary of Feedback during the RAP Awareness meeting undertaken on 4<sup>th</sup> May 2023

*Department of Water, Natural Resources, Environment and Climate Change*

- ✓ There is need to consider the issue of project sustainability e.g. provide renewable energy to minimize operational costs
- ✓ Namanga will be the first operational sewer system in the subcounty-it is a significant project in the county
- ✓ Allow for increased women participation in the project
- ✓ Provide durable materials considering the prevalence of wildlife especially elephants in the proposed project area

### *Community meeting*

The client introduced the project to the community and indicated the key components -dam, water supply, sewerage system





The project engineer assured the community that the odour nuisance will be mitigated

The community expressed concern in the following areas:

Will the project compensate for trees felled?

The area is susceptible to erosion -this may lead to exposed pipes which may be vandalized or damaged

*The pipes will be more than 1 meter into the ground*

We have an example of KETRACO which made false promises, how do we get the assurance that what we have agreed will be implemented?

*All aspects agreed upon will be included in the design which the community will validate implying that they must be implemented*

Apart from the monetary compensation are there other benefits for the PAPs?

*No other specified benefits but the principle is that all the affected persons will not be disadvantaged*

*There will be meeting specifically for the PAPs to discuss specific compensation issues and procedures*

Community leaders were charged with responsibility of ensuring women participate in the project

The sewer treatment plant site area will be sealed off and guarded

### Summary

- ✓ Need for sustained community participation in project planning/design
- ✓ The compensation process will entail notification, provision of information, engagement and compensation
- ✓ An inventory of the land to be affected will be taken
- ✓ The Client through the consultant will work with the local administration and NLC who will oversee the compensation process.
- ✓ There is need for the community to regularize their land tenure



Plate 5-4: RAP Awareness Meeting on 4th May 2023





## 6 ANALYSIS OF ALTERNATIVE

### 6.1 Introduction

The Proposed Namanga Sanitation Project is set to be implemented in Namanga Town in Kajiado County. The sewer line will cover Namanga Town and the sewer treatment plant will be located in the lower parts of the town. This chapter analyses the different alternatives considered in selection of the sanitation design.

### 6.2 The No Project Alternative

The no-action alternative is often defined by the baseline information and is crucial in the assessment of impact because other alternatives are weighed with reference to it. This alternative would mean that the project does not proceed.

The no project alternative option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from the conservative environmental perspective as it ensures non-interference with the existing conditions. Under no project alternative, the proponent's proposal would not receive the necessary approval from NEMA and proposed project would not be constructed. This option will however, involve several losses both to the community and the county as a whole. Development of the project on the other hand will improve water provision to the residents of Namanga.

The no project option will however lead to the following (general) major negative and long-term impacts:

- OLWASCO and OWASCO will not be able to provide sewer services to its consumers. This will limit their sustainability and revenue base.
- Continued use of exhauster services which is a costly and inconvenient way of waste disposal
- Stunted economic growth within the urban areas as a result of poor sanitation
- Poor economic stimulation as a result of unemployment
- Skills of the locals will remain underutilized

This scenario is not appropriate on either social or environmental grounds.

### 6.3 The Project Design Alternative

Sewerage collection systems are normally designed as one of three different types: The principal objective of wastewater treatment is generally to allow human and industrial effluents to be disposed of without danger to human health or unacceptable damage to the natural environment.

#### 6.3.1 Conventional treatment

A centralized water treatment approach, also known as conventional treatment, uses a combined process of coagulation, flocculation, sedimentation, filtration, and disinfection. It treats water in a central location and then distributes water via dedicated distribution networks. A centralized water treatment system can treat large volumes of water at high rates to accommodate all residential, business, and industrial uses. This approach is well developed and can effectively remove practically any range of raw water turbidity along with harmful pathogens, including bacteria, virus, and protozoa. However, the capital cost and operating and maintenance costs for a centralized system can be significant. It consists of water source



development, construction of significant infrastructures (e.g., the treatment facility, reservoir, and water distribution main), implementation of automated monitor and control systems, and on-site operators

### **6.3.2 Decentralized Waste Water Treatment System**

Decentralization focuses on the on-site treatment of wastewater and on local recycling and reuse of resources contained in domestic wastewater. Decentralized solutions in general will tend to be compatible with local water use and reuse requirements, where locally treated water could support agricultural productivity or (in more urban areas) be used as a substitute for drinking-quality supply water for compatible uses. They however require intensive management protocols which if not adhered to result into multiple negative impacts.

### **6.3.3 Natural biological treatment systems**

Natural low-rate biological treatment systems are available for the treatment of organic wastewaters such as municipal sewage and tend to be lower in cost and less sophisticated in operation and maintenance. Although if properly designed they are more effective in removing pathogens processes, they tend to be land intensive by comparison with the Decentralized Waste water treatment Facilities.

Given there are no constraints of land availability in Namanga Town the disadvantage does not hold. Its cost effectiveness also makes it a suitable option.

#### **6.3.3.1 Selected Pipe Material**

Concrete (cement, sand and ballast), building stones and steel reinforcement bars will be used in the construction of the weir. Valve chambers will also be constructed using these materials.

Pipes and fittings will be used to convey water from the intake through to the farms. The pipes will vary in size and type but most will be GI (Galvanized Iron) and uPVC for trunk sewers.

Timber will be used as shuttering material during the casting of the intake structure whereas building stones will be used in the construction of valve chambers.

Wastes to be generated during the construction phase will include wood chippings, pipe shavings and used cement bags. It is recommended that the wood shavings be composted and used as manure, while the pipe shavings and the cement bags are recycled

## **7 IMPACT IDENTIFICATION AND ANALYSIS**

### **7.1 Introduction**

The proposed project will have varied impacts on both environment and community, which can be classified as either negative or positive impacts. The impacts have been identified based on a comprehensive analysis of the proposed environment and project. Further, the impacts categorized as either positive if they are beneficial to or negative if they are detrimental. The following section will discuss the impacts of the project at various phases from pre-construction phase to decommissioning phase.

### **7.2 Impacts during the construction phase**

#### **7.2.1 Positive impacts**

##### ***Employment opportunities***

Both the preconstruction and construction phases of the proposed project will offer job opportunities to professionals and unskilled workers. Formal, semi and unskilled employees will get employed on the project sites during pre and construction period. Professionals as well unskilled people (casual workers) including youth from both from within and outside the community where the project will be undertaken will work in the project in various capacities. People who will be employed by the project will earn either salaries or wages, which will improve their living standards. Casual labourers involved in clearing and excavation of trenches for sewer pipes and holes, plumbers, engineers, supervisors are some of the people who will benefit from employment opportunities.

##### ***Creation of market for materials used during construction***

The project will utilize various materials such as pipes, pumps, valves, Cement, Sand, stones chemicals among others which will be sources in markets located in and outside the project area. The usage of these materials will provide a ready market for the local and regional suppliers.

##### ***Improvement of the local economy and wealth creation***

A considerable amount of the project budget will be discharged into the local economy through various ways during the construction period. Various activities related to construction (such as small food and drinks venturing, fuel and accommodation) will come up along project sites which will improve the local economy. Further, there will be payment of workers and purchase of construction materials, which will spur growth of the local economy.

##### ***Upgrading the Quality of Life***

The implementation of the proposed project will improve the quality of life and the hygienic conditions in the areas. The operation of the sewerage system will relieve these areas to a great extent from previous problems that were caused by the continuous emptying of cesspools. In the past, hotels and blocks of apartments were required to empty and maintain septic tanks and soak ways. The sewerage system provides a healthier and more appropriate way to manage liquid wastes.

##### ***Preserving the Natural Environment***

Previously, all sewage waste was discharged in septic tanks and cesspits, resulting in the pollution of the ground water resources, surface water bodies of the areas where such waste are



discharged and other various risks and other environmental problems. Treated sludge is used as a soil-improving substance mainly for tree cultivations whilst methane is being used for electricity generation, covering part of the power, required to operate the plant.

### ***Saving and Processing Waters***

Water is a substantial natural resource for our country and it should be managed in the best possible manner. The tertiary treated effluent at the wastewater treatment plant is reused for agricultural and other purposes. On completion of the project, the amount of water to be saved is expected to exceed 10 million cubic meters per year. Today around 4 million cubic meters of water are reused per annum.

### ***Saving of Money***

The implementation of the infrastructure will result to financial savings as the existing means of exhauster is beyond the means of the residents of the area.

### ***Economic Development and Tourism***

The most significant advantage of the system is maintaining sustainable development, the protection of the environment and improvement of the quality of life in our town, with a further impact on the development of tourism and the economy in general.

### ***Standard of Living***

With the implementation of the sewerage system, we and our children will enjoy a better quality of life in the years to come and that we will secure a better environment to the forthcoming generations.

### ***Waste Reduction***

Through the treatment of wastewater, the amount of waste that is usually released into the environment is reduced thus improving environment's health. By doing so, the government in turn reduces the health risks associated with environmental pollution, and reduces the water loss induced through water pollution. Wastewater treatment also reduces the amount of money spent by a country on environmental rehabilitation projects required to battle pollution.

## **7.2.2 Negative Impacts**

### ***Vegetation clearing***

During the construction phase, land will be cleared and excavated. There will be clearance of site and excavation activities on the land where sewer distribution lines will penetrate. In addition, vegetation clearance and excavation will occur in specific sites where sanitation facilities will be put up. Clearance of land will affect both small animals (including insects) and plants as well as loosen soils at these sites. Thus, one of the possible negative impacts of the project is interference of the ecosystem and habitat modification. Excavation activities of the project will also disrupt the soil structure and profile as well as surface water run-off direction on sites where this will be undertaken. This might result to soil erosion where soils can be washed and be deposited in lower areas such as rivers if proper mitigation measures are not undertaken.

### **Mitigation Measures**

The project will undertake various mitigation measures to limit soil erosion and enhance vegetation cover.



- Reduce vegetation clearance as much as possible
- Carry out proper disposal of the soil and other materials that will result from land clearance and excavation to avoid sedimentation in river and wind erosion
- Plant native grass and trees where appropriate on the bare land after project completion to reduce soil erosion and restore aesthetic appearance on the land
- Cement blending will be done in selected areas away from water drains to avoid draining into rivers
- Organize for regular disposal of solid waste (Spilled cement and concrete) in proper disposal sites
- The employees of the project will be sensitized on proper handling and disposal of cement and concrete spillages

### ***Air Quality and Pollution***

There is a likelihood of air pollution incidences due to emissions from the construction equipment, excavators or even manual excavation, vehicles and trucks coming to the construction site. Piling of soil and sand, cement mixing could also result from the construction activities. There might be occurrence of bad odors resulting from piling of waste construction materials.

### **Mitigation Measures**

- ❖ Conduct regular maintenance of the construction machines during operation to reduce air missions.
- ❖ Sprinkle water on the ground before earth moving to control dust emission into the air
- ❖ Maintain piled materials dump to reduce dust and particles emissions
- ❖ Notify close neighbors about air pollution during the period and conduct the project in shortest time possible
- ❖ Regular sprinkling of the construction site, to lessen dust emission from the construction site

### ***Extreme Vibration and Noise Pollution***

It is difficult to avoid noise during the construction phase of the project. There will be noise emission from the construction activities of the project resulting from the equipment and vehicles visiting the site. Noise levels in construction works are usually below the threshold limit (90 dBA) that workers can be exposed in 8 hours working day and is consequently not of any major concern. Operations and people in the neighborhood are likely to be affected since noise beyond 85 dBA (can be transmitted up to 30 metres away) is itself a nuisance. The significance of noise impacts depends on whether the project would increase noise levels above the existing ambient levels by introducing new sources of noise. Noise and vibration impacts would be considered significant if the project would result in: a substantial permanent increase in ambient noise levels of more than 90 dBA. Extreme vibration and noise pollution can be disruptive to the area residents especially in the early morning and late-night periods.

### **Mitigation Measures**

- Several measures will be undertaken to mitigate against excessive vibration and noise including:
- Avoid construction during early morning and late night when noise is loudest
- Clearly label high noise areas
- Provide hearing protection (PPE) to workers and visitors in high noise areas





- Equip the machines to be used with standard noise attenuation features and use machines with the accepted noise limits.
- Inform the local residents of the project areas when there is a likelihood of excessive noise generation
- Conduct sensitization of the workers such as truck drivers to minimize unnecessary noises like hooting especially in sensitive areas (schools, hospitals)

### ***Oil waste pollution***

During the construction, the equipment/Machinery will require greasing for maintenance while vehicles and trucks working on project site might require petroleum oils and greases. Spilling of the Oils and Grease on the ground may result to both soil and water system in the system. This impact will be managed appropriately during construction and will not be a significant problem during the operation phase of the project.

### **Mitigation Measures**

The workers and operators of construction machines and vehicles will be educated on efficient and effective maintenance to reduce spillage.

### ***Solid Waste Generation***

There will be generation of solid wastes during construction including papers used for packaging, plastics, stones, cuttings among other materials. Dumping of these materials in the project sites will interfere with the aesthetic value and condition of the surrounding environment. Some of the materials like plastics may collect water when it rains and act as breeding grounds for pests and mosquitoes which are vectors to diseases.

### **Mitigation Measures**

- ✚ Proper solid waste collection and storage containers ought to be provided at the project sites to reduce littering of the site
- ✚ The contractor should take initiative to arrange with the county government waste management officials for regular collection of the wastes from the site
- ✚ Promote recycling and re-use of wastes wherever possible

### ***Water Quality pollution***

There will be loosening of soil due to excavation, which may lead to surface water run-off that may end up in rivers and streams. Further, spillage of wastes such as oils, cement, and sand may drain into water sources when it rains.

### **Mitigation Measures**

- There will be restoration of the vegetation cover of the excavated areas through planting of grass and indigenous trees where applicable will reduce soil erosion and hence control water quality pollution.
- Besides, proper management of oil and solid wastes arising from construction activities will be done including sensitization of the workers on waste management.

## **7.3 Impacts during the Operation Phase**

The proposed project's operation phase will have both positive and negative impacts.



### **7.3.1 Positive Impacts**

The positive impacts will accrue through elimination of discharges of untreated sewage and this (assuming suitable mitigation measures are incorporated) far outweighs the negative impacts associated with the proposed development. Positive impacts of the phase will include the following:

#### ***Improved health of the people***

The project will result to access to sanitation services for communities which lacked the services before which will in turn improved health due to reduced water-borne diseases and other unhygienic related diseases. The general hygiene of the project areas will be enhanced because the sewerage distribution system and sanitation facility will ensure the community to access clean environment. Access to a clean environment is one of the rights enshrined under article 42 of the Constitution of Kenya.

#### ***Improved living standards***

The project will result to reduced diseases outbreaks and hence improved health which will translate into increased work productivity. Local People will be able to work better and earn an income that will enhance their livelihoods. Besides, people will be employed for maintenance of the completed sewer system and sanitation facility such as plant operators and thus earn an income to improve their standards with the ultimate impact being poverty alleviation

#### ***Improved pollution control and monitoring***

The proposed project will centralize the town's wastewater treatment and will make pollution monitoring easy and more effective.

#### ***Progress in achievement of Vision 2030 and SDGs***

The operation phase of the project will facilitate access to sanitation services as envisioned in the social pillar of Vision 2030. Access to these services will spur economic growth through employment opportunities and improved living standards and health hence facilitating achievement of the economic pillar of the country's development blue print. Further, potential investors will develop the region as they will be guaranteed of good infrastructure of sewer disposal.

#### ***Improved aesthetic value***

The operation phase of the project will drain waste water in the target areas that currently lack a sewer distribution network which will result to cleaning up of the mess that is currently experienced in storm water drains in the target towns.

### **7.3.2 Negative Impacts**

The operation phase might also have negative impacts such as:

#### ***Public health issues***

Public health concerns might arise during the operation phase from either blockage or leakage of the sewerage system. Poor hygiene in the sanitation facility that is set to be built also poses health risks to the public using the facility.

#### ***Contamination of Water Resources***



There is a possibility of contamination of drinking water sources by sewage from raw sewage overflow, leaking or burst sewer lines and partially treated wastes. Sewage is a complex mixture, which may contain many types of contaminants. The greatest threats posed to water resources arise from contamination by bacteria, nitrates, metals, trace quantities of toxic materials and salts. Sewerage seepage into drinking water sources can cause disease from ingestion of pathogenic microorganisms. Additionally, flooding of the wastewater as well as leakage from the treatment ponds can threaten groundwater resources.

### **Mitigation Measures**

The treatment pond should be made as impermeable as practically possible in order to prevent possible contamination of ground water or shallow wells in the area. This should be coupled with regular inspection and maintenance of the sewer line to safeguard against sewer line blockages and leakages. There will also be regular monitoring of the quality of effluent and reports submitted to NEMA for approval. The water quality of the receiving streams will be monitored to check on changes on its quality

### **Eutrophication**

Sewage ending into our water bodies if not treated is known to trigger algae bloom resulting to oxygen depletion which has devastating impact to aquatic life. This will solve the vice

### **Mitigation measures**

- Ensure that the sewerage is properly treated before disposal
- Quality tests should be conducted to ensure that it meets the expected public health standards

### **Odour problems**

Odour may result from scum, leakage, and blockage of the sewer lines and sewerage treatment ponds/lagoons. Wind plays an important factor in contributing or controlling odour and thus it is best controlled by appropriate design and is reduced by proper alignment of the treatment ponds. The size of the ponds will result in some degree of wave action.

### **Mitigation Measures**

Mitigating this impact entails ensuring proper design and alignment of the treatment lagoons and planting trees around the area where the ponds/lagoons are located for wind breaking.

#### **7.3.2.1 Negative Impacts Cross Cutting between Construction and Operation Phases**

### **Increased demand on water resource-use**

During the construction phase, both the workers and the construction works will generate increased demand for water. Some of the water uses will include in cleaning activities, mixing of concrete for construction works, dampening the surfaces, curing or cleaning completed structures. The operation phase will also require more water for activity cleaning and waste discharge. The increased water-use may be a source of water-related conflicts within the community.

### **Mitigation Measures**

- Consider the Water Act, 2016 and EMCA Act 1999, (revised 2015) which govern water abstraction and use and require permits for abstraction of large volumes of water for



commercial use.

- Ensure that installation of sewer system follows local government requirements.
- Consider rain water harvesting to have alternative water supply for use at the sanitation facility

### ***Increased demand on energy resource-use***

There will be increased demand for energy during construction and operation phases. During the construction period, electricity may be utilized to run machines such as soil compacting machines and drills while fuel will be used to run generators, wheel loaders, excavators, and construction vehicles. Since electric and fuel in Kenya are generated mainly through natural resources, namely water and geothermal resources, increased use of electricity have adverse impacts on these natural resource bases and their sustainability. The project will comply with the government policy to minimize energy consumption.

### **Mitigation Measures**

The project will minimize energy consumption by:

- ✚ Switching off all energy using equipment when not in use
- ✚ Use of florescent tubes and energy saving bulbs for lighting purposes
- ✚ Using energy efficient night-time lighting only at the premises
- ✚ Installing alternative energy sources such as solar panels and automatic generators not only for power back-up but also to reduce dependency on electricity
- ✚ Use of machines and equipment that saves energy without compromising on cost or availability factors.
- ✚ The management of the sewer plant should be advised to adopt more energy efficient measures to reduce on power consumption which would translate to cost saving and less burden on the insufficient power supply system in the area and County.

## **7.4 Decommissioning Phase**

The decommissioning phase will only have negative impacts as elaborated below:

Decommissioning of the proposed project would mean demolition of both the sewer distribution system and sanitation facility. Demolition is the most significant part of decommissioning, as it is associated with various negative impacts. If the project is demolished the likely impacts will include: poor living standards and poverty, dust, noise and vibrations emissions, solid wastes and impacts associated with occupational health and safety among others.

### ***Poverty/poor living standards***

Demolition of the project would result to loss of employment opportunities for the workers of the project and hence loss of livelihood that would result to poor living standards.

### ***Noise and vibrations emissions***

The demolition works of the project may lead to significant deterioration of the environment within the project site and the surrounding areas through noise and vibrations. Noise is a health hazard while vibrations have the effect of lowering the strength of adjacent buildings by creating cracks in the walls.

### ***Dust and exhaust emissions***



Large amounts of dust will be generated during demolition works, which would entail excavation to remove the sewer pipes and breakdown of the sanitation facility. Exhaust emissions will also result from the machinery and equipment used in demolition. Such emissions are linked with health problems ranging from respiratory disorders to complex diseases of the respiratory system.

### ***Excessive amounts of solid wastes***

Demolition of the sewer treatment ponds and related infrastructure will result in large quantities of solid wastes. The wastes will contain the materials used in construction including concrete, metals, drywall, wood, glass, paints, adhesives, sealants, and fasteners. While this waste may generally be considered as less harmful to the environment due to its composition of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. In addition, even the generally non-toxic chemicals such as chloride, sodium, sulphates and ammonia which may be released as a result of leaching of demolition waste are known to lead to degradation of ground water quality.

### **Mitigation Measures for Adverse Impacts during Decommissioning Phase**

- The proponent should prepare and submit to NEMA a decommissioning report three months before decommissioning takes place
- The use of the site or sanitation building may be changed to other appropriate uses after renovation, rehabilitation and structural changes.
- The decommissioning and alternative land-use options should be facilitated by appropriate professional personnel expertise including county government planners; environmental experts; public works officers and public health officers among others.
- Since decommissioning may take place after a long period of time, the process shall follow the environmental laws and regulation that will be in existence at that time.

## **7.5 Impact Analysis**

*Table 7-1: Analysis of identified impacts to determine if mitigation is required or not*

Possible Impacts	Type of Impact	Mitigation Required	Mitigation Not required
Air quality	Significant/ Localized/Social		
Landscape changes	Significant/Localized/Social		
Water quality	Moderately significant/ecological		
Worker's safety & welfare	Significant/Localized/social		
De-vegetation	Very Significant Localized/ ecological		
Noise & vibrations	Significant /Localized/Physical		
Legal considerations	Significant/social		
<b>Operation Phase</b>			
Reduced liquid waste disposal	Very Significant/localized/social		
Employment	Significant/localized/social		





Possible Impacts	Type of Impact	Mitigation Required	Mitigation Not required
Improved sanitation	Very Significant/localized/cumulative/social		
Operation and maintenance	Very Significant/Localized		
Safety considerations at Sewer Treatment Plant	Very Significant/Localized		
Increased generation of waste water	Significant/Localized		
Water Quality	Very Significant/ localized/social		
Water Conservation	Significant/Localized		
<b>Decommissioning Phase</b>			
Occupational health and safety issues	Very Significant/localized/social		



## 8 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

### 8.1 Introduction

Several impacts have been identified that are likely to affect the project both positively and negatively. They have also been identified based on three different project phases: construction, operation and decommissioning phase. A plan illustrating how the identified impacts will be managed throughout the project cycle has been formulated. However, it is important to note that before the construction commences, the contractor will be required to develop an updated Environmental and Social Management Plan that will be implemented during the construction phase of the project.

Table 8-1 Environmental and Social Management Plan.

Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementation Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
<b>Construction Phase</b>						
<b>Wastes generation, Piling and disposal</b>	Risks of both surface and underground water resources pollution.	-Construction wastes will be disposed safely -Promote recycling of wastes where applicable - Proper solid waste management as per	Supervisory team.	-Absence of solid waste on the project site -Amount of waste recycled/ reused -Waste management Regulations. <b>Freq:</b> Continuous	Minimal environmental pollution.	500,000

Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementation Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
		NEMA waste management regulations				
<b>Excavations and trenching activities</b>	-Health and Safety risks -Air pollution -Social interference -Vegetation cover degradation -Loss of biodiversity -Soil erosion	-Properly demarcate the project area to be affected by the construction works to avoid spillover effects to neighboring areas -Conduct awareness campaigns in the areas surrounding the project sites to inform immediate communities and stakeholders of the activities	Contractor	<ul style="list-style-type: none"> <li>• Presence of a perimeter Fence</li> <li>• Absence of air pollution on site</li> <li>• Re-vegetation during decommissioning</li> <li>• Absence of soil erosion</li> <li>• Lack of complaints/ incidences/ accidents</li> <li>• Presence of signage and notices on site</li> <li>• Presence of barriers along the walkways</li> </ul>	Reduced environmental degradation.	300,000

Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementati on Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
		<ul style="list-style-type: none"> <li>-Provide notices, signage and information to the public for their safety at all locations</li> <li>-Install barriers along walkways affected by the works for public safety</li> <li>-Ensure earth moving and excavation is done under dump conditions by watering where necessary.</li> </ul>		<ul style="list-style-type: none"> <li>• Absence of dust during excavation</li> <li>• Rehabilitation of project site.</li> </ul> <p><i>Freq:</i> Throughout the project cycle.</p>		
<b>Noise and Vibration control from</b>	Risk to health and safety of community and	-The contractor shall adhere to the acceptable noise and vibration	Contractor	<ul style="list-style-type: none"> <li>-Number of decibels of noise generated</li> <li>-Absence of complaints</li> </ul>	Reduced noise pollution	100,000



Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementation Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
<b>construction Machines and Equipment.</b>	workers	limits as stipulated in relevant regulations  -Limit construction activities to normal working hours in the residential areas		from the public on noise pollution.  <b>Freq:</b> Continuous		
<b>Air quality Control</b>	-Air pollution causing respiratory ailments and diseases	-Training of workers on air pollution management  -Maintenance of construction machinery and equipment in accordance to agreed specifications	Contractor	-Reported cases of pollution -Equipment/ machine service plans/ schedules -Amount of vegetation Removed <b>Freq:</b> Continuous	Improved air quality	150,000



Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementation Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
		-Removal of vegetation will be delayed to critical time when it is required and re-vegetation be done as soon as possible				
<b>Operational phase</b>						
<b>Land and soil degradation</b>	Environmental degradation	<ul style="list-style-type: none"> <li>- OLWASCO to quickly respond to burst sewer pipes to reduce excessive soil erosion</li> <li>- Provide suitable drainage in high risk areas for effective channeling of</li> </ul>	Proponent, OLWASCO	<ul style="list-style-type: none"> <li>-Soil analysis reports</li> <li>Physical examination of the areas</li> <li>-Presence of vegetation along the sewer line</li> <li>-Manhole marks along the sewer line.</li> </ul> <p><b>Freq:</b> Continuous.</p>	Reduced land and soil degradation.	200,000

Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementation Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
		burst sewerage spills -Educate land owners along sewer systems to enhance vegetation cover along the corridor areas to reduce soil washing - Clearly demarcate the sewer pipelines for ease of identification.				
<b>Risk of the sewer line blockage and overflows to the environment</b>	Potential health hazards and environmental pollution	-Conduct awareness campaigns on responsible waste disposal -Adopt appropriate	Proponent	-Number of blockage incidences recorded as a result of the project -Conduct water quality assessments from samples collected from rivers	Reduce environmental pollution and potential health hazards.	200,000



Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementation Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
		designs that can withstand anticipated blockage problems  -Regular monitoring of the system to identify issues.		where wastes will be drained.  <b>Freq:</b> Continuous		
<b>Breakages or leakage of sewer lines and the treatment ponds.</b>	Contamination of soil and ground water	-The treatment pond should be made as impermeable as practically possible in order to prevent possible contamination of water resources  -Regular inspection and maintenance of	Contractor Supervisory team.	-Number of ponds made impermeable  -Number of sewer blockages and leakage incidences  -Monitoring reports (weekly, Quarterly and Annual).	Reduced soil and ground water contamination	300,000



Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementation Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
		the sewer line to safeguard against blockages and leakages  -Regular monitoring of the quality of effluent for quality changes and reports submitted to NEMA for approval.				
<b>Decommissioning Phase</b>						
<b>End of project strategy</b>	The project shall bear detrimental impacts if necessary measures are put in place to prevent environmental	-The Project shall subject the project to an abandonment environmental and social impact assessment or risk management in	OLWASCO & OWASCO	Decommission strategy/Plan <b>Freq:</b> End of Project	Environmental protection	To be Determined.



Activity	Impact/Issue Description	Mitigations/ Remedial Actions	Implementation Agency(s)	Monitoring Indicators & Frequency	Mitigation Target	Mitigation Cost (Ksh)
	hazards and risks resultant of the abandonment. This may include the dam safety and security issues, the conveyances and the changes to the concerned community	the event of closure of the project -The process shall involve all the concerned parties -The legislations and best environmental practices prevailing then shall apply.				



## **9 CONCLUSION AND RECOMMENDATION**

### **9.1. Conclusions**

The project upon completion would realize several positive impacts, most significant of which being reduction of public health hazard as result of improved sewerage conditions in Namanga Town. The project has been planned in full cognizance of the requirements of the Namanga Town where it is to be implemented and all standard planning considerations have been taken into account and given the attention they deserve. The following conclusions were arrived at:

- The project does not pose any serious environmental concern, other than those mentioned with their mitigation measures;
- The positive environmental impacts the project will realize far out-scales the negative ones, which can be contained by following the prescribed ESMMP;

### **9.2 Recommendations**

This environmental examination process therefore establishes a negative determination of the impacts on the environment and hence recommends that the proposed construction works be implemented with full adherence of the Environmental and Social Monitoring and Management Plan. Having considered the information collected, collated and analyzed through field study and literature review, the following recommendations were arrived at:

- a) The project proponent should commence the project immediately once this report is approved;
- b) Ensure that worker's occupational health and safety standards are maintained through capacity building, proper training, providing protective clothing and managing their residential camps up to the required health standards;
- c) The local community should be sensitized to abate stealing of pipes and metals of the sewerage system, and;
- d) Once the project is complete, there is a need to develop plans to recycle waste/sludge e.g. into briquettes, fertilizer
- e) The design should ensure comprehensive waste water treatment to allowable limits by NEMA and WHO standards and public health Guidelines, before releasing into the river;
- f) Involvement of all relevant stakeholders is proposed throughout the process to ensure project acceptability;
- g) All construction waste will be properly disposed off in a timely manner, the excavated material wherever possible will be used as raw material for a range of activities, such as road repair or construction, and for use as building material e.g. stones;
- h) Annual environmental audits should be carried out on the project in order to ensure compliance of the project with the mitigation measures outlined in the Environmental and Social Management Plan (ESMMP);
- i) There is need to have all the safety measures put in place so as to promote the well-being of the workers especially at the construction phase and the pipe laying phases.
- j) The contractor tasked with carrying out the sewerage construction should use the local labour during the project cycle to empower the communities financially and also build their capacity in their general maintenance. These personnel should be trained to effectively manage the project once construction is completed.

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- Runji Consulting Group (2021) Draft Detail Design Report for Detailed Design of Namanga Dam Water Supply and Sanitation Project

## **10 APPENDIX**

### **10.1 Lead Expert License**

Application Reference No:.....164.....  
Registration No:.....0401.....

FOR OFFICIAL USE



THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT  
**CERTIFICATE OF REGISTRATION AS AN ENVIRONMENTAL IMPACT  
ASSESSMENT/AUDIT EXPERT**

This is to certify Ms.....**MR. SAMMY C. LETEMA**.....  
of.....**P.O. BOX 43844-00200, NAIROBI**.....(Address)  
has been registered as an Environmental Impact Assessment Expert in accordance with the provisions  
of the Environment Management and Coordination Act and is authorized to practice in the capacity of  
a Lead Expert/Associate Expert/Firm of Experts (Type).....**LEAD EXPERT**.....

Dated this ...**15<sup>TH</sup>**.....day ...**NOV**.....of 20..**06**....

Signature.....

(Seal)

Director General  
The National Environmental Management Authority





**nema**

mazingira yetu | uhai wetu | wajibu wetu

FORM 7

(r.15(2))

**NATIONAL ENVIRONMENT MANAGEMENT  
AUTHORITY(NEMA)  
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

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

License No : NEMA/EIA/ERPL/19606

Application Reference No: NEMA/EIA/EL/25512

**M/S SAMMY LETEMA**  
(individual or firm) of address  
P.O. Box 43844 - 00100 NAIROBI

is licensed to practice in the  
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**  
**General**

registration number **0401**

in accordance with the provision of the Environmental Management and Coordination  
Act Cap 387.

Issued Date: 5/17/2023

Expiry Date: 12/31/2023

Signature.....

(Seal)

**Director General**

**The National Environment Management Authority**

P.T.O.



ISO 9001:2015 Certified





**nema**  
mazingira yetu | ulhai wetu | wajibu wetu

Payment Receipt

Invoice Number: [EPL\\_25512](#)

Invoice Status: [PAID](#)

Payment Date: [09/05/2023](#)

Applicant Details:

PIN: [A004651127J](#)

Name: [SAMMY LETEMA](#)

Phone:

Email: [sletema@yahoo.com](mailto:sletema@yahoo.com)

Service	Description	Amount (KES)
Expert License	Payment for Expert License	5,000
Convenience Fee	Ecitizen Convenience Fee	50.00
Total Amount Paid		5,050
Balance		0

Payment Mode  **eCitizen**

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## **10.2 TOR Approval**



# NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Mobile Lines: 0724-253 398, 0723-363 010, 0735-013 046  
Telkom Wireless: 020-2101370, 020-2183718  
Incident Lines: 0786-101100, 0741-101100

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Website: [www.nema.go.ke](http://www.nema.go.ke)

**NEMA/TOR/5/2/392**

**9<sup>TH</sup> February, 2022**

**Chief Executive officer**

Tanathi Water Works Development Agency  
K.I.D.P Building, Along Kalawa Road  
Private Bag-90200

**KITUI**

**RE: ACKNOWLEDGEMENT AND APPROVAL OF TERMS OF REFERENCE  
(TOR) FOR ENVIROMENTAL IMPACT ASSESSMENT**

---

We acknowledge the receipt of TOR for the above subject.

Pursuant to the Environmental Management and Coordination Act, 1999 the second schedule and the Environmental (Impact Assessment and Audit) Regulations 31 and 35, your terms of reference for the Environmental Impact Assessment (EIA) for the proposed **Design of Namanga Dam Water supply and sanitation project** has been approved.

You shall submit ten (10) copies, a soft copy summarised version of the ESMP in **WORD** form and one electronic copy of your report prepared by a registered expert to the Authority.

**MARRIAN KIOKO**  
**HEAD EIA SECTION**

### **10.3 Attendance List and Minutes of Meetings**





## **TANATHI WATER WORKS DEVELOPMENT AGENCY**

### **CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECT**

CONTRACT NO. TAWWDA/028/2020-2021



## **Resettlement Action Plan (RAP) Report**

**May 2023**

**Runji Consulting Group**   
Engineering & Project Management  
P.O Box 68053-00200  
Nairobi, Kenya



## INTERNAL QUALITY CONTROL

Revision	Purpose description	Originated	Checked	Reviewed	Authorized	Date
Rev 1.0	Issue to Client	SL AKM	MR	MMM DMO	RN	25/08/2022
Rev 1.1	Incorporation of valuation report	AKM NK	MR	JOM	RN	22/05/2023



## **ABBREVIATIONS**

ACC	Assistant County Commissioner
TAWWDA	Tanathi Water Works Development Agency
CSOs	Civil Society Organizations
DCC	Deputy County Commissioner
DPs	Displaced Persons
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESAP	Environmental and Social Assessment Procedures
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FI	Financial Intermediaries
GO	Grievance Officer
IVSC	International Valuation Standards Committee
KFS	Kenya Forest Services
M & E	Monitoring & Evaluation
MIC-TAF	Middle-Income Country Technical Assistance Fund
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
PAP	Project Affected Persons
RAP	Resettlement Action Plan
RIU	RAP Implementation Unit
WaSSIP	Water Supply and Sanitation Service Improvement Project
WRUA	Water Resources Users Association
WSS	Water Sanitation Services
WTP	Water Treatment Plant
OLWASCO	Ol Doinyo Orok Water & Sewerage Company Ltd
OWASCO	Olkejuado Water & Sewerage Company
PAPs	Project Affected Persons

## EXECUTIVE SUMMARY

### ES1: Introduction

This RAP Report is prepared as per the Terms of Reference (ToR) for the *Consultancy Services for Detailed Design of Namanga Dam Water Supply and Sanitation Project*. The RAP has been established in order to ensure that any economic or physical displacement resulting from the Project, whether permanent or temporary is undertaken in a socially responsible manner and according to good international practice. Relevant national legislation and financier policies are applied in the Project.

### ES2: Project Resettlement Impact Screening

The screening of Project resettlement impacts was undertaken with the aim of determining the nature, scope and extent of Projects activities to people's property; as the observations are summarized below;

- Loss of land
- Loss of trees (Ol Doinyo Orok Forest)

### ES3: Methodology and Approach

The methodology and approach employed by the consultant are aimed at ensuring effective participation by the public that comprises of both the affected and the hosting community. The approaches employed are both qualitative and quantitative techniques.

- a) Qualitative techniques include: Literature Review and Key Informant Interviews using open ended questionnaires
- b) Quantitative Techniques employed is a structured questionnaire for Socio-economic survey and census survey for asset inventory of the affected property by the Valuer.

### ES4: Socio economic baseline condition

A socio-economic survey targeting the affected persons was undertaken 12<sup>th</sup> September 2022 to 17<sup>th</sup> September 2022. Data was collected among 209 respondents in Namanga, Maili Tisa, Ngatataek and Bisil town centres. It also included respondents from Ormankeki Village (Sewer area) and Enkokidong'oi Village (Dam area). The data was analysed using Statistical Packages for Social Scientist (SPSS) Software.

**Sex Distribution:** The males predominate the project area, but the females were well represented in the exercise.

**Age Distribution:** Majority of the population are aged between 18-47years with the highest age group being those between 28-47years.

**Income:** Most of the respondents earned below KSHS 10,000 monthly salary with a majority of them being self-employed.

**Education Level:** The highest level of education for most respondents is Secondary School, but 23.4% also reported to have no formal education.

**Sources of Water:** The main sources of water for the residents include boreholes, water kiosk/vendors and piped water into households that was deemed highly unreliable during the dry season.



**Human Waste Disposal:** 79.9% of the respondents rely on Pit latrines for disposal of human waste.

**Land Ownership:** Most of the land within the project area lies under the freehold tenure system. However, very few land owners possess title deeds as proof of ownership. Within the town centres, majority of the land owners possess allotment letters as proof of ownership.

## ES5: Institutional and Legal Framework

The Draft RAP has been prepared in compliance with the requirements of the relevant national legislation of the Republic of Kenya. The assessment acknowledged that portions of private land will be acquired either as easement or permanently for construction of the Project. The process of land acquisition will be as provided by Land Act 2012, Land Registration Act 2012, National Land Commission Act 2012 as well as the African Development Bank Operation Safeguard (OS 2) on Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation

Articles 40 of the 2010 Constitution of the Republic of Kenya establish the fundamental principles of right to and protection of private property. In addition to the overarching principles stated in the Constitution, key legislation applicable to land management and expropriation in Kenya includes:

- (a) The Constitution of Kenya
- (b) Land Act 2012
- (c) Land Registration Act 2012
- (d) Valuation Act
- (e) National Land Commission Act
- (f) AfDB OS 2 on Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation

## ES6: Summary of Project Impact

As per the Detailed Design Report, the size of land needed for the entire project implementation is 186.15 acres. Table 0-1 below shows the exact affected size of land in acres and Ha for each component and the total cost of compensation inclusive of the 15% disturbance allowance.

Table 0-1: Estimates of Affected Land Parcel for the various project components

Project Component	Affected Land size in Acres	Affected Land size in Ha	Total Compensation Cost (Inclusive of Disturbance Allowance (KES)
Dam area	64.2451	25.9996	73,881,888
Tank 1,3,4	0.997	0.4035	1,819,341
Pump station 1 & 2	3.5533	1.4380	8,494,996
WWTP	104.3822	42.2429	240,079,160
Access Road	3.053	1.2355	5,266,467
Trunk Line	9.9235	4.0160	36,069,902
<b>Total</b>	<b>186.1541</b>	<b>75.3355</b>	<b>365,611,755</b>



Table 0-2: Summary of total valuation costs

	ASSETS CATEGORY	MARKET VALUE (KSHS)	ADD 15% DISTURBANCE ALLOWANCE (KSHS)	TOTAL VALUE (KSHS)
1	Land (186.15 Acres)	317,923,265.00	47,688,490.00	365,611,755.00
2	10% Contingency Sum			36,561,175.52
	<b>GRAND TOTAL</b>			<b>402,172,931.00</b>

## ES7: Stakeholder Engagement

The consultant held public meetings with the Project Affected Persons to create awareness about RAP and mainly the Valuation exercise as shown in the table below. The PAPs had an opportunity to raise any concerns or inquiries regarding the resettlement process.

Table 0-3: Schedule of RAP Awareness Meetings

S/NO	Date	Venue	Target Audience
1.	8 <sup>th</sup> December 2022	First Baptist Church	PAPs at Maili Tisa and Enkokidong'oi Village
2.	4 <sup>th</sup> April 2023	Elim Full Gospel Church	PAPs along the Sewer System (Namanga and Ormankeki)
3.	5 <sup>th</sup> April 2023	First Baptist Church	PAPs at Maili Tisa and Enkokidong'oi Village

The hosting community for the dam and water transmission lines accept the project. However, the PAPs along the Sewerage System (Trunk Lines and WWTP) have not fully accepted the project. There is need for more sensitization in the area and provision of additional benefits such as being part of the water supply during distribution. The land owner at the proposed WWTP is not willing to be physically displaced by losing his entire land parcel of 100 acres. He indicated he can only part with 50 acres.

## ES8: Valuation and compensation issues

Property valuation in Kenya is carried out by valuation professionals registered under the Valuers Act Cap. 532 of the laws of Kenya. A registered Valuer (with Valuers Registration Board) is a trained professional who has a thorough knowledge and understanding of the factors that create, maintain, or diminish values of real estate or assets. Valuation of assets is done in accordance with the Practice Statements and Guidance Notes published by the International Valuation Standards Committee (IVSC), adopted and recognized by international accounting standards and risk management professionals.

Valuation methodology adopted as determined by the Valuer when undertaking the Valuation exercise was a Comparative Sales Approach (Market Comparables Approach).





## ES9: Compensation and Resettlement Strategy

The Kenya Constitution 2010 allows the government and local governments to acquire land for the purpose of community betterment or the public interest.

Eligibility for compensation include

- a) Part or whole parcels of his or her land is tagged for compulsorily acquisition for the effective implementation of the Project;
- b) S/he occupied this land earmarked for project activities, prior to the cut-off date – i.e. the date recommended for the census.
  - The entitlement ‘cut-off’ date refers to the time when the census and assessment of PAPs and their property in the project area were carried out and ended. This was explained to the community members and PAPs during community dialogues and the PAP census. The date shall be set by NLC when undertaking the actual acquisition process during the project implementation.
- c) His or her rights or claim to the tagged land falls into any of the following categories:
  - Formal legal rights to land as recognised by the national and customary Laws of Kenya. Persons considered here are those that hold leasehold land, freehold land and, land held within the family or passed on through generations.
  - No formal legal rights to the land or assets at the time the census begins, but has recognised claim of use of such land or ownership of assets through the national and customary Laws of Kenya. Persons taken into account here are those that come from outside the country and have been given land by the local dignitaries to settle, and or to occupy.

No recognisable legal rights or claim to the land s/he is occupying, using or getting his or her livelihood from. Persons allowed under this considered here include encroachers and illegal

There are two forms of compensation PAPs are entitled to – Cash compensation and non-monetary or in kind compensation.

In addition to the compensation, the Project proposes livelihood improvement interventions such as:

- Capacity building which includes access to financial training for the PAPs to enhance the sustainable use of cash compensation.
- Construction of social infrastructure such as road improvements, equal access to employment opportunities during construction, financial and entrepreneurial training.

## ES10: Grievance Redress Mechanism

In line with IFC requirements, the Grievance management provides for three tiers of amicable review and settlement, with the first tier at the site level, second level will integrate a mediation committee in case the grievance cannot be solved at first level and finally there will be an option for each of the complaint to resolve to the court of law (third level) in case there is no resolution of the grievance with the mechanism

## ES11: RAP Implementation

Both PAPs will be compensated before clearance for construction commences. Client will be the lead agency in the RAP implementation and will work together with the County and National Governments in the PA to implement the RAP. TAWWDA will establish a RAP



Implementation Unit (RIU), to implement this RAP ensuring that PAPs promptly access their compensation entitlements and that their livelihoods are restored after resettlement.

### RAP Budget

The estimated RAP budget for all components is summarised in Table 0-4. Table 0-5 and 0-6 provide the separate RAP budgets for Dam & Water Transmission and the Sewerage System respectively.

*Table 0-4: Estimated RAP Budget for all Components (Dam, Water Transmission & Sewerage System)*

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition + forest material	402,172,931
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>402,482,931</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	40,248,293
	<b>Total Cost 2</b>	<b>442,731,224</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	55,341,403
	<b>GRAND TOTAL</b>	<b>498,072,627</b>

*Table 0-5: Estimated RAP Budget for Dam & Water Transmission*

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition	149,437,283
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>149,747,283</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	14,974,728
	<b>Total Cost 2</b>	<b>164,722,012</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	20,590,251
	<b>GRAND TOTAL</b>	<b>185,312,263</b>

*Table 0-6: Estimated RAP Budget for Sewerage System*

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition	281,415,530
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>281,725,530</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	28,172,553



	<b>Total Cost 2</b>	<b>309,898,083</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	<b>38,737,260</b>
	<b>GRAND TOTAL</b>	<b>348,635,343</b>

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## **ACRONYMS/ABBREVIATIONS**

ACC	Assistant County Commissioner
ADF	African Development Fund
AfDB	African Development Bank
CSOs	Civil Society Organizations
DCC	Deputy County Commissioner
DPs	Displaced Persons
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESAP	Environmental and Social Assessment Procedures
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FI	Financial Intermediaries
GO	Grievance Officer
IVSC	International Valuation Standards Committee
KFS	Kenya Forest Services
M & E	Monitoring & Evaluation
MIC-TAF	Middle-Income Country Technical Assistance Fund
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
PAP	Project Affected Persons
RAP	Resettlement Action Plan
RCC	Roller Concrete Compacted
RIU	RAP Implementation Unit
TAWWDA	Tanathi Water Works Development Agency
WaSSIP	Water Supply and Sanitation Service Improvement Project
WRM	Water Resources Management
WSS	Water Sanitation Services
WTP	Water Treatment Plan

## DEFINITION OF TERMS USED IN THIS REPORT

The following terms shall have the following meanings, unless the context dictates otherwise<sup>1</sup>:

**Census:** A field survey carried out to identify and determine the number of Project Affected Persons (PAP) or Displaced Persons (DPs). The meaning of the word also embraces the criteria for eligibility for compensation, resettlement and other measures emanating from consultations with affected communities.

**Project Affected Person:** This is a person affected by land use or acquisition needs of the Water Supply and Sanitation Service Improvement Project (WaSSIP) in Kenya. The person is affected because s/he may lose “title to land or right to its use”, and/or “title rights or other rights to structures constructed on the land” (thus s/he may lose, be denied, or be restricted access to economic assets, shelter, income sources, or means of livelihood). The person is affected whether or not s/he must move to another location.

**Compensation:** The payment in kind, cash or other assets given in exchange for the acquisition of land including fixed assets thereon.

**Cut-off date:** The date of commencement of the census of PAPs or Displaced Persons within the project area boundaries. This is the date on and beyond which any person whose land is occupied for project use, will not be eligible for compensation.

**Displaced Person:** A person who, for reasons due to involuntary acquisition or voluntary contribution of their land and other assets under the project, will suffer direct economic and or social adverse impacts, regardless of whether or not the said Displaced Person is physically relocated. The person will have his or her standard of living adversely affected, whether or not s/he must move to another location. S/he will lose right, title, interest in any house, land (including premises, agricultural and grazing land) or any other fixed or movable assets acquired or possessed, lose access to productive assets or any means of livelihood.

**Involuntary Displacement:** The involuntary acquisition of land resulting in direct or indirect economic and social impacts caused by: loss of benefits from use of such land; relocation or loss of shelter; loss of assets or access to assets; or loss of income sources or means of livelihood, whether or not the Displaced Person has moved to another location or not.

**Involuntary Land Acquisition:** This is the repossession of land by government or other government agencies for compensation, for the purpose of a public project against the will of the landowner. The landowner may be left with the right to negotiate the amount of compensation proposed. This includes land or assets for which the owner enjoys uncontested customary rights.

**Land:** This refers to agricultural and/or non-agriculture land and any structures thereon whether temporary or permanent and which may be required for the Project.

**Land Acquisition:** This means the repossession of or alienation of land, buildings or other assets thereon for purposes of the Project.

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<sup>1</sup> Water Supply and Sanitation Service Improvement Project (WaSSIP). 2007. Resettlement Policy Framework, RP 583. Government of the Republic of Kenya.

# **1 CHAPTER ONE: INTRODUCTION**

## **1.1 Project Background**

Tanathi Water Works Development Agency (TAWWDA), an implementing agency has received funding from The Ministry of Water & Sanitation and Irrigation (MoWSI) for the Detailed Studies and Design of Namanga Dam Water Supply and Sanitation Project. This mission is in line with requirement of Vision 2030 and is aimed at augmenting water supply and sanitation services to meet the current and futuristic water supply and sanitation demands for Namanga Town and neighbouring urban centres.

TAWWDA is the legal Agency mandated with construction of water works within Machakos, Kitui, Makueni and Kajiado counties. Prior to 3rd May 2019, TAWWDA was known as Tanathi Water Service Board (TAWSB). The Agency is mandated to undertake the development, maintenance, and management of National public water works within the area of jurisdiction. The Agency is also mandated to operate the water works and provide water services as a water provider, until such a time as a responsibility for the operation and management of the waterworks are handed over to a County Government. The Agency provide technical services and capacity building to such County Governments and water services providers within its areas as may be requested and provide to the Cabinet Secretary technical support in the discharge of his or her functions under the Constitution of Kenya and the Water Act 2016.

In the present study assignment, TAWWDA has contracted Ms. Runji Consulting Group Ltd to undertake the Detailed Design of Namanga Dam Water Supply and Sanitation Project. The Consultant commenced the studies on 25<sup>th</sup> May 2021. The conclusion of the assignment will be marked by the finalisation of design reports, tender documents, ESIA report and RAP report for the Project.

Prior to the present assignment, the Agency engaged Ms Seven Seas Consultants Limited for the Feasibility Studies and Preliminary Designs, cost estimates and tender documentation of the Project. The studies concluded in June 2020, recommended further investigations on construction of Namanga Dam, water treatment plant, water distribution to serve Namanga Town and Maili Tisa Town Centre.

Namanga Town and its environs fall under the arid and semi-arid lands (ASAL). The area receives low rainfall, experience frequent dry periods, seasonal rivers and has an acute shortage of clean water supply. The problem is compounded by the increased urban population induced by internal border activities. Also, the positive fruits of devolution have created more opportunities fuelling growth in what were small market centres and towns, turning the urban areas into busy commercial centres and local government administrative centres.

## **1.2 Project Location**

The proposed Project is located in Kajiado County, Kajiado Central Constituency. Namanga Town is located at the Kenya-Tanzania border at latitude S 2°32'39.8" and longitude E 36°47'20.2". The town is divided by the Tanzania-Kenya border with southern parts of the town in Longido District, Tanzania and northern in Kajiado County, Kenya. It is about 139km South-south East of Nairobi city and about 85km South of Kajiado Town via the A104 Nairobi-Namanga Road. The nearby Ol Doinyo Orok Hills, also known as Namanga Hills is located



northwest of Namanga town. Main source works for the proposed Project is a new dam to be designed across Namanga River within Ol Doinyo Orok hills.

The dam site is located at a distance of approximately 22km from Namanga Town. It is about 6km from Mile Tisa centre. The dam axis is at approximately coordinates 255820 E, 9729302 N, Arc 1960 / UTM zone 37S (latitude 2°26'59.57"S, Longitude 36°48'17.76"E).

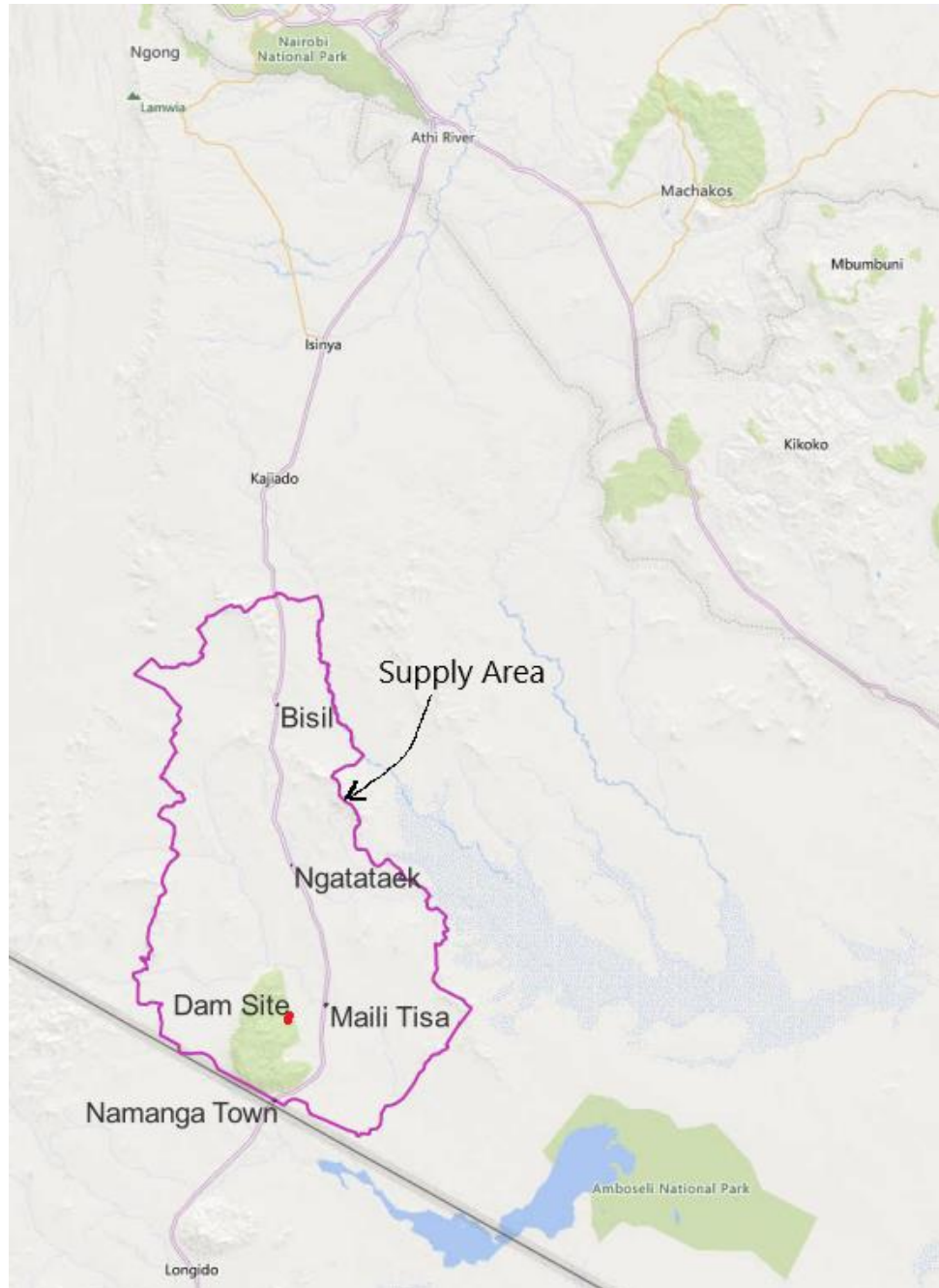


Figure 1-1: Project Location



The dam will supplement the existing water supply that include river intake and existing boreholes. The Project is located within Kajiado Central constituency. The Project mainly covers Matapato South and Matapato North wards.

The proposed dam is to supply water to Namanga Town, Maili Tisa Centre, Ngatataek Centre, Bisil Town and all the settlements between these towns.

Sewerage works for this project is limited to Namanga Town. The proposed area for the Sewerage Treatment Plant is in Ormankeki Village, Namanga sub-location. To cater for collection and disposal of wastewater within the whole of Namanga Town, the stabilization ponds have been proposed at 8Km east of Namanga town. The co-ordinates of the ponds location are: 37M, 262044, UTM 971981 Namanga Location. The proposed Trunk is located along the river valley to give it adequate gradient for any future connections.



Figure 1-2: General Layout of Namanga Sewerage

### 1.3 Project Description

The key technical details of the proposed project study are as below;

- Design period: the current study has considered 2026, 2036 and 2046 as the initial, future and ultimate years respectively
- Ultimate population for the project area considered is of 77,150 (year 2046). The considered population translate to demand of 6,981m<sup>3</sup>/day. This includes domestic and all other demands including livestock, commercial, institutional...etc.
- Due to limited water availability from the catchment/ river, the proposed dam has been sized to supply 6000m<sup>3</sup>/day for the project area. This is 86% of the project area demands. The balance shall be supplied by other sources including existing boreholes and river intake.
- The proposed dam is to supply water to Namanga Town, Maili Tisa Centre, Ng'ataek Centre, Bisil Town and all the settlements between these towns. Sewerage works is limited to Namanga Town.
- Water pipelines that utilize gravity and solar powered pumped system
- Proposal for new boreholes
- Sewerage works for Namanga Town to include trunk sewers, and limited secondary and tertiary sewers
- Wastewater treatment ponds
- Ablution blocks

The specific features for each component are as discussed below:

#### 1.3.1 Dam Component

The key features of the dam are:

Table 1-1: Summary of the features of the proposed dam

Hydrology	River Basin	Namanga River
	Catchment area	12.5 km <sup>2</sup>
	PMF	186.32m <sup>3</sup> /s
	10,000-year flood	167.68 m <sup>3</sup> /s
	Spillway Design Flood	186.32m <sup>3</sup> /s
	Sediment yield	500 m <sup>3</sup> /km <sup>2</sup> /year
Reservoir	Full Supply Level (FSL)	1329 m
	Minimum Operation Level of the reservoir (MOL)	1319.5 m
	Maximum water level (MWL)	1331.1 m
	Gross storage capacity	1.21 Million m <sup>3</sup>
	Dead storage capacity	0.32 Million m <sup>3</sup>



	Live storage volume	0.89 Million m <sup>3</sup>
	Area to be inundated at full Supply level	0.121 km <sup>2</sup>
Main Dam	Type of dam	Rock fill dam with central impervious core
	Dam top level	1332.2 m
	Dam foundation level (deepest section)	1303.5 m
	Dam structural height	28.7 m
	Crest length	355 m
	Crest width	9.5 m
	Upstream slope	1: 2.5
	Downstream slope	1: 2
	Embankment fill volume	163,000 m <sup>3</sup>
Spillway	Design discharge	186.32m <sup>3</sup> /s
	Type of spillway	Non-gated overflow with cement lined chute
	Spillway crest level	1329 m
	Spillway crest length	30 m
Stilling Basin	Width of stilling basin	30 m
	Length of stilling basin	16 m
Intake	Location	On upstream face of dam on Left bank
	Type	Concrete tower with 3 openings. Dry wells
	Design discharge	Domestic water: 0.069 m <sup>3</sup> /s; Environmental flow: 0.047 m <sup>3</sup> /s;
Coffer Dam	Type of dam	Rockfill dam with clay core
	Dam top level	1322 m
	Dam foundation level	1304 m
	Dam height above river bed	11m
	Crest length	225 m
	Crest width	4 m



	Upstream slope	1: 2.5
	Downstream slope	1: 2
	Size	Box culvert, 2.5m x 2.5m
	Length	145m
	Type	Reinforced concrete

### 1.3.2 Gravity Raw Water Mains

- 160m long, 350mm diameter steel gravity raw main from the Dam downstream control chamber to Treatment plant.

### 1.3.3 Water Treatment Plant

- Inlet Chamber and Inlet Channel. Simple Flow Measurement of incoming water will be taken in the Inlet Channel;
- Flocculation preceded by Chemical Dosing of Soda Ash and Alum; 2.5m x 2.5m x 2.5m deep
- Sedimentation - Horizontal Flow Tanks; 3No. horizontal flow tanks, each 17m x 6m, depth varying from 2.5m to 3.0m. Surface overflow rate 1.6 m<sup>3</sup>/m<sup>2</sup>/hr
- Filters - Rapid Gravity Sand Filtration; 4 Nr of filters, 4.5m x 3.5m Dimensions, Rate of filtration 5m<sup>3</sup>/m<sup>2</sup>/hr
- Disinfection by Chlorination; Chemical Building equipped
- pH Correction - Soda Ash Dosing;
- Clearwater tank; 30.5m by 30.5 m and 5.21m high. The capacity of the tank is 3500m<sup>3</sup>
- Backwashing using water only; Tank is 212m<sup>3</sup>, providing water by gravity for backwashing
- Administration, Chemical & Chlorine Dosing Building, Pump house and, Staff Housing etc. and other Ancillary Works
- 2No. Sludge Drying Beds, 1.25m deep and with a total area of 61.2m<sup>2</sup>.

### 1.3.4 Water Supply Transmission and distribution

- HDPE 560mm PN8 Gravity main from the Water Treatment Plant To Pump Station 1– 9,397.2m
- Steel 300mm PN25 Rising main from Inkati Pump Station 1 To Oloilai Pump Station 2– 24,133m
- HDPE 400mm PN25 Rising main from Oloilai Pump Station 2 To Lenkishon Tank 3 – 11,111.76, m
- HDPE 125mm PN16 Gravity main from Lenkishon Tank 3 To Tank 4 in Bisil – 10,929m





- HDPE 450mm PN10 Rising main from Inkati Pump Station 1 To Tank 1 – 3,940m
- HDPE 355mm PN10 Gravity main from Tank 1 To Distribution System Offtake 2 – 7,580m
- HDPE 280mm PN10 Gravity main from Offtake 2 To Distribution System Offtake 3- 860m
- HDPE 225mm PN8 Gravity main from Offtake 3 To Namanga Town Distribution - 618.80m
- Storage tanks in four tanks in total: 1 No. 100m<sup>3</sup>, 1 No. 150m<sup>3</sup>, 1 No. 1,000m<sup>3</sup> and 1 No. 2000m<sup>3</sup>
- 2 No. pumping stations complete with pumps and solar farms in each.
- Rehabilitation of Existing Water Reservoirs
- Distribution Water Pipelines
  - HDPE DN 25 to DN 125mm pipeline – 32,067m
  - HDPE DN 250 pipeline – 7,575m
  - Steel DN 100 – 11,536m

### 1.3.5 Sewerage Works

- 3000m<sup>3</sup>/day full waste water treatment plant complete with Inlet works, Waste stabilisation ponds and associated works, Overflow/ outfall sewer, Sludge drying beds, Site works and access roads, Utility building, Staff houses
- 8.1km 500mm dia HDPE sewer line
- 1km 400mm dia HDPE sewer line
- 10.9km 300mm dia HDPE sewer line
- 1.417km 250mm dia HDPE sewer line
- 7-No. Ablution blocks (Including provision of 4 No. of exhausters and 2 No. of flashing units)

### 1.4 Scope of the proposed Project

The main scope of the assignment is to undertake the following:

- To carry out detailed designs and tender documentation for Namanga Dam Water Supply and Sanitation Project
- To provide the client with regular status reports and other reports as per the Terms of Reference, together with all related necessary technical assistance and professional advice to the Client related to supervision of the construction of the said works;
- To prepare and assist in the implementation of Resettlement of Project Affected Persons (RAP).



## 1.5 RAP Objectives

This Resettlement Action Plan (RAP) is prepared in accordance to the Kenyan Constitution and other framework such as the operational policies developed by Financiers such as World Bank and AfDB. RAP ensures that PAPs who are faced by any economic or physical displacement resulting from a project, whether permanent or temporary, will be resettled in socially responsible manner and according to good international practice.

Therefore, the main purpose of this Resettlement Action Plan (RAP) was to understand the socio-economic characteristics of the Project Affected Persons who are likely to be displaced during the project implementation. It also seeks to provide a detailed plan on how the affected persons will be resettled and their livelihoods restored to a better position than they were before the project. The RAP report also seeks to quantify and value the assets or individual properties in order to secure funds that will be used for compensation during project implementation.

In this regard, the specific objectives and tasks related to the RAP process are as follows:

- Undertake a socio-economic survey of the communities along the proposed project site.
- Conduct a census of the affected persons.
- Develop an eligibility criteria and establishment of a cut-off date.
- Evaluate and prepare an inventory of the affected properties
- Evaluate all other socio-economic costs.

## 1.6 Approach and methodology

Participatory approach was employed throughout the process which is key in enhancing Project ownership and acceptance. The engagement of stakeholders targeting both the secondary and primary stakeholders was done.

Both qualitative and quantitative methodologies were explored and the data triangulated at the analysis stage. The following techniques were employed:

### 1.6.1 Qualitative Technique

#### 1.6.1.1 Literature review:

This entailed a desktop research of existing literature to understand the previous and existing socio-economic conditions within the project area. The reports that were reviewed include:

- i. Kajiado County Integrated Development Plan (2018-2022)- The review intended to relate how the plan influences land uses within the project area. It also sought to determine if the County Government had plans for finding alternative water sources and determining how they can be fed into the designed system.
- ii. Kajiado County Spatial plan (2019-2029)-The review was aimed at determining if the County had planned any development activities such as the establishment of a Sewerage plant for Namanga town and any future plans for the towns within the project area.
- iii. Annual Development Plan (2020-2021)-During this financial year, the County Government of Kajiado sought to enhance availability and sustainable management of water and sanitation for all.
- iv. Feasibility Study Report by Seven Seas Consultants Ltd 2020- The Consultant had conducted a socio-economic baseline assessment that would be used to evaluate the socio-economic wellbeing of the individuals within the project area.

- v. The Constitution of Kenya-A review of legal and policy framework was essential in order to establish the land use rights within the project area and other regulations that needed to be adhered to during the project implementation.
- vi. Financiers Policies and guidelines on implementation of the Social Safeguards. IFC, World Bank and the African Development Bank (AfDB) have operational policies and guidelines on involuntary resettlement.

#### **1.6.1.2 Stakeholder Consultations**

Stakeholder consultation and public forums on the project were convened across the project area targeting the women, youth, trader's associations and civil society groups. Key informant interviews using an open ended questionnaire were also conducted in various departments at the County Government such as the Department of Water, Lands, Environment & Natural Resources, Health, Kenya Forest Services.

Public meetings that targeted the project affected persons whose private land will be acquired for the implementation of the project were conducted on 8<sup>th</sup> December 2022, 4<sup>th</sup> April 2023 and 5<sup>th</sup> April 2023. The meetings were aimed at creating awareness about the land acquisition process, the valuation methodology that is considered and address any concerns of the PAPs.

### **1.6.2 Quantitative Techniques**

#### **1.6.2.1 Socio-economic survey:**

The collection of socio-economic data conducted was conducted using a structured questionnaire that was administered in the field by enumeration clerks. Interviews were done amongst individuals, households and businesses within the project area to establish their socio-economic features like sex and age distribution, source of income, levels of income, literacy levels, sources of water for domestic use, human waste disposal approaches and status of land ownership.

#### **1.6.2.2 Census Survey**

An asset inventory of property that would be affected was also compiled by the Valuer based on the design of the dam, water treatment plant, transmission pipeline, storage tank areas, trunk lines and Waste water treatment plant. The Valuation report has been annexed to this RAP Report.



## 2 CHAPTER TWO: SOCIO-ECONOMIC BASELINE CONDITIONS

### 2.1 Introduction

The socio-economic survey is an essential aspect when planning for resettlement of the affected persons. The primary data is collected in order to understand the existing social conditions and determine how they might be affected by the project implementation. According to the World Bank Environmental and Social Framework, the condition of the Project Affected Persons should be improved by a project and not worsened. Therefore, the primary data helps in assessing and monitoring their wellbeing throughout the project cycle.

The survey was conducted for five days from 12<sup>th</sup> September 2022 to 17<sup>th</sup> September 2022. The sociologist trained a team of twelve (12) enumerators who were sourced locally and worked in pairs. A questionnaire was used as a data before embarking on data collection in Namanga, Maili Tisa, Bissil, and Ngatataek towns. Other areas where the questionnaires were administered include within the Enkokidong'oi village (hosts of the dam) and Ormankeki village (hosts of the WWTP). A summary of the target areas is as shown in the table below:

Table 2-1: Summary of targeted areas for the Socio-economic Survey

Project Component	Target Area
	Sub Location/Town/Village
Water Supply	Il Bisil
Water Supply	Ng'atataek
Water Supply	Elenyata (Maili Tisa town center)
Water Supply	Namanga town
Sewerage System	Oloolaroi (Ormankeki Village)
Dam, WTP, Access Road, & Raw Water	Eng'aboli (Enkokidong'oi village)

The collected data was analysed using Statistical Packages for Social Scientists (SPSS) software and the findings are as represented and discussed in section 2.3.

### 2.2 Objectives for the Data Collection

The specific objectives for collecting the socio-economic data include:

- To determine the social characteristics of the individuals and businesses within the project area
- To identify the vulnerable and directly affected project affected persons
- To identify the potential project impacts particularly on the livelihoods of the PAPs.
- To identify the concerns and preferences of the PAPs.

### 2.3 Socio-economic characteristics of the PAPs.

#### 2.3.1 Sex and Age Distribution

From the data analysis, majority of the people living within the project area are aged between 18-47yrs with the largest population being those between 28-37yrs (34.4%) as shown in Table 2-2 below. This implies that the participants between the 18-47years have proper comprehension, attitude and practices towards the project. They were able to understand the



project and express their views, concerns and more so negotiate on the benefits that they can obtain from the project implementation through Corporate Social Responsibility.

Table 2-2: Distribution of respondents by age

Age (Years)			
		Results (n)	Percent (%)
Unknown		13	6.2
18-27yrs		42	20.1
28-37yrs		72	34.4
38-47yrs		58	27.8
48-57yrs		17	8.1
Above 57		6	2.9
Below 18		1	.5
Total		209	100.0

In terms of sex distribution, the male respondents were 117 (56%) while the females were 81 (38.8%) as indicated in Table 2-3 below.

Table 2-3: Distribution of respondents by sex

SEX			
	Frequency		Percent (%)
Unknown	11		5.3
Female	81		38.8
Male	117		56.0
Total	209		100.0

### 2.3.2 Sources of Income and Distribution

Out of the 209 respondents who were interviewed along the project area, it is evident that they engage in both formal and informal employments. The different sources of incomes depend on the occupation of the respondents with the highest being self-employed (41.63%) followed by those in formal employment earning a wage/salary (33.01%). The self-employed individuals comprise mainly of business owners/traders. The main business that the locals engage in is livestock rearing. Other businesses include retail shops selling variety of products that range from food items, clothing, hotels & restaurants at the town centres. Another major activity that the respondents engage in is farming of vegetables although it is mainly subsistence farming that is done in small-scale. Another source of income is contribution from family members, but this was observed among the elderly families who rely on their children and other family members for sustenance. 5.74% were unwilling to disclose their sources of income. Figure 2-1 below illustrates the different sources of income among the respondents.





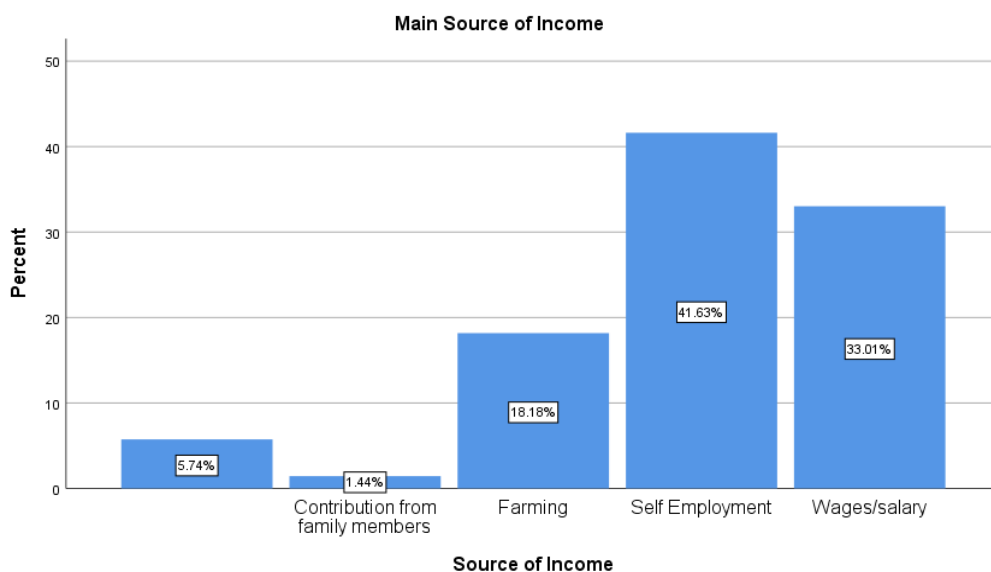


Figure 2-1: Sources of income among respondents

An analysis of the income distribution indicates that the level of income is quite low as most of the respondents indicated they earned below KES 10,000 in a month. 27.8% respondents earned between KES 5001-10000 while 21.5% earned below KES 5,000. Kenya is experiencing a high cost of living currently and as the fuel prices continue to rise, the prices of consumer goods is expected to continue rising. This implies that the levels of poverty within the project area are expected to increase sharply. However, if the proposed project is implemented, income generating opportunities such as hawking of foods to the labourers, supplying of sand contracts, employment opportunities for casual labourers will be offered to the locals and help in boosting the income levels. Additionally, once the water supply situation is improved, the time spent sourcing for water can be used to engage in income generating opportunities.

Most importantly, if there are any sources of livelihoods that will be affected by the project, adequate compensation should be offered to the affected person to ensure their live is not interfered with, but rather improved. The project design was significantly adjusted to ensure the transmission lines utilize the road corridor. It is mainly along the trunk line for the sewerage system where a wayleave and the WWTP traverses across private land necessitating acquisition.

Table 2-4: Income levels among respondents

INCOME DISTRIBUTION		
Monthly Income Range (KES)	No of respondents (n)	Percentage (%)
Unknown	29	13.9
< 5000	45	21.5
5001-10000	58	27.8
10001-15000	28	13.4
15001-20000	20	9.6
20001-50000	21	10.0



50001-100000	5	2.4
100001-250000	2	1.0
250001-500000	1	.5
Total	209	100.0

### 2.3.3 Education Level

From the data collected, only 23.4% of the respondents lacked formal education while a majority 37.3% had secondary education, 15.3% primary education, 12.9% had attained college/university diploma/degree with only 3.3% having pursued post graduate education. The education level in the area indicates that majority of the population can provide unskilled labour during the construction phase. Opportunities for the skilled labourers who meet the necessary qualifications will also be offered to the community.

The low number of respondents who have attained diploma/degrees can be attributed to several factors. For instance, the lack of institutions of higher learning within the project area and in Oloilai Sub county, cultural practices such as early marriages and teenage pregnancies, natural calamities like severe drought and famine.

Table 2-5: Level of education of the respondents

Education Level		
Education Levels	Number of respondents (n)	Percentage (%)
Unknown	16	7.7
No formal education	49	23.4
Primary	32	15.3
Secondary	78	37.3
College/University	27	12.9
Post graduate	7	3.3
Total	209	100.0

### 2.3.4 Water Sources

The residents within the rely on a variety of sources of water for their domestic use. 27.8% of the respondents reported that the main source water is from boreholes while 25.4% reported that they purchase water from water vendor/kiosks. (See Table 2-6 below) 20.6% have piped water into their homesteads, but the water is rationed whereby it is only available once a week. This indicates that water scarcity is a main challenge in Namanga that intensifies during the dry season. The respondents incur high expenses as they source for water for their household use. It is reported that women have to walk long distances in search of this precious commodity. Therefore, implementation of the project would have a positive significant by ensuring ease of access to water. 0.5% of the respondents who stated that they sourced water from the river stated that it was an option mainly during the rainy season because the river dries up during the dry season.



Table 2-6: Sources of water among the respondents

Sources of Water		
Sources of Water	Number of Respondents (n)	Percentage (%)
Unknown	14	6.7
Borehole/well	58	27.8
Piped water into plot/dwelling	43	20.6
Protected spring	1	.5
Public tap	39	18.7
River	1	.5
Water vendor/kiosk	53	25.4
Total	209	100.0

### 2.3.5 Sanitation

Namanga town has no Sewerage system. The residents build houses with septic tanks that are drained using exhausters at a fee. Based on the data collected, 79.9% of the respondents rely on pit latrines as their main mode of human waste disposal. Only 1% have flush toilets that drain into septic tanks while 12% rely on the bush/flying toilets as shown in Table 2-7 below. Upon the project implementation, the waste water is expected to increase and the cost of draining the Septic tanks by the private exhausters might be high due to the high demand for the services. Additionally, if the wastewater is not properly managed, it could pose a public health hazard and cases of waterborne diseases could be reported in the area. Therefore, the project seeks to implement a Sewerage system in Namanga town and expand the services to the other town in future.

Table 2-7: Mode of human waste disposal among the residents

Mode of Human Waste Disposal		
Mode of human waste disposal	Number of respondents (n)	Percentage (%)
Unknown	15	7.2
bush/flying toilet	25	12.0
Flush toilet to Septic Tank	2	1.0
Pit Latrine	80	38.3
VIP	87	41.6
Total	209	100.0

### 2.3.6 Land Ownership

In Kajiado County, land ownership is classified into three namely communal, private, and public land. Most of the land is registered either leasehold or freehold interest. An estimated 95 percent and 5 percent of land in rural and urban areas is registered and titled respectively. The mean land holding size in the county stands at nine (9) Ha in small scale and 70 Ha on large scale.

From the data collection, 62.7% of the respondents indicated that land ownership within the project area is freehold as indicated in Table 2-8 below. However, 26.8% of the respondents did not know. This implies the need for public sensitization on land ownership within the



project area. It was also observed that most of the land owners lack title deeds, instead they possess allotment letters as proof of ownership. Some of the few respondents who have title deeds are yet to begin the succession process.

Table 2-8: Land Tenure System

Land Tenure System		
Land Tenure	Number of respondents (n)	Percentage (%)
Unknown	11	5.3
Do not know	56	26.8
Customary	1	.5
Freehold	131	62.7
Leasehold	3	1.4
Public	7	3.3
Total	209	100.0

During the RAP Awareness meetings, the Valuer explained to the affected persons the process of acquisition and urged those who have not commenced on the succession process to do so.



### 3 CHAPTER THREE: LEGAL AND INSTITUTIONAL FRAMEWORK

#### 3.1 Introduction

One of the requirements of ESIA report is to interrogate the necessary and relevant laws that govern the establishment of the projects. It is part of Legal requirements within the Laws of Kenya that a development of such magnitude adheres to certain legal parameters.

Similarly, the RAP as an important part of ESIA, has been prepared in compliance with the requirements of the relevant national legislation of the Republic of Kenya. The process and procedures of land acquisition for the Namanga Dam WSSP Project will be principally governed by Kenya land laws including; Land Act 2012, Land Registration Act 2012, National Land Commission Act 2012 as well as the AfDB OS 2

Kenya has several legislations that are related to land acquisition and resettlement. AfDB also has standards and guidelines on Involuntary Resettlement. The aim of these series of measures is to ensure that adequate mitigation measures are put in place by the project proponent to deal with any negative impacts on the project affected persons.

This chapter sets out the legal operating environment for acquisition of land. The chapter highlights major issues related to Kenyan land legislation with regards to involuntary resettlement in this RAP. It provides a brief overview of the Kenya land policy, and the Kenya's constitutional provisions related to land use, planning, acquisition, management and tenure, and more specifically the legislations related with land expropriation or acquisition, land valuation and land replacement.

#### 3.2 Relevant Legal Frameworks

Summary of the relevant legal frameworks are found below.

*Table 3-1: Legal Frameworks that the project will be submitted to*

Legal Framework	Requirements
The Constitution of Kenya 2010	Under Chapter 5 (Land and environments) in Part 2 (Environment and natural resources). Section 42 gives every person a right to a clean and healthy environment, which includes the right; and to have the environment protected for the benefit of present and future generations
Way Leaves Act (Cap. 292):	The Act provides for certain undertakings to be constructed e.g. transmission lines, pipelines, canals, pathways etc., though, over or under any lands. This project is under the provision of the Act. Section 3 of the Act states that the Government may carry any works through, over or under any land whatsoever provided it shall not interfere with any existing building or structures of an ongoing activity. Where the line touches buildings or interferes with people's livelihoods, the Act requires written consent of affected parties and compensation thereof.





Land Acquisition Act (Cap. 295):	This Act provides for the compulsory or otherwise acquisition of land from private ownership for the benefit of the general public. For the acquisition to take place, the minister responsible must issue a gazette notice. The Act also provides for full compensation to the affected parties.
The Registered Land Act, Cap 300, Laws of Kenya:	This provides for the absolute proprietorship over land (exclusive rights). Such land can be acquired by the state under the Land Acquisition Act. This is of particular relevance to way leave acquisition.
The Land Adjudication Act, Cap 95, Laws of Kenya:	This provides for ascertainment of interests prior to land registrations under the Registered Land Act.
National Land Commission Act 2012	The act establishes the National Land Commission with the purpose of managing public land and carrying out compulsory acquisition of land for specified public purposes.

### 3.3 National Relevant Laws

Adopted in August 2009, the National Land Policy (“NLP” or “Policy”)<sup>2</sup> provides an overall framework for new legislation and defining key measures required to address critical issues such as land administration, access to land, land use, and restitution related to historical injustices and an out-dated legal framework. Further NLP addresses constitutional issues such as compulsory acquisition and development control.<sup>3</sup> Section 45 of the NLP defines compulsory acquisition as “the power of the State to extinguish or acquire any title or other interest in land for a public purpose, subject to prompt payment of compensation.”<sup>4</sup> Under the current Constitution,<sup>5</sup> the Land Act 2012 empowers the National Land Commission (under the guidance of Minister for Lands) to exercise the power of compulsory acquisition on behalf of the State.<sup>6</sup> Similarly, the NLP empowers the National Land Commission to compulsorily acquire land.<sup>7</sup>

### 3.4 The Constitution of Kenya (2010)

The Constitution of Kenya, 2010,<sup>8</sup> which is the supreme Law of the land, protects the sanctity of private property rights and states that no property can be compulsorily acquired by the Government except in accordance with law.<sup>9</sup> Article 40(3) states:

<sup>2</sup>Sessional Paper No. 3 of 2009 on National Land Policy (referred to as the “National Land Policy” in this report) was adopted in August 2009 by the Ministry of Lands. Available at [http://www.lands.go.ke/index.php?option=com\\_content&task=view&id=238&Itemid=48](http://www.lands.go.ke/index.php?option=com_content&task=view&id=238&Itemid=48), accessed May 25, 2011.

<sup>3</sup> Development control is the power of the State to regulate the property rights in urban and rural areas and is derived from the State’s responsibility to ensure that the use of land promotes the public interest.

<sup>4</sup>Sessional Paper No. 3 of 2009 on National Land Policy, § 45.

<sup>5</sup> The Constitution of Kenya, 1963, was replaced in 2010.

<sup>6</sup> Land Act, § 6, 2012.

<sup>7</sup>Sessional Paper No. 3 of 2009 on National Land Policy, §233(d).

<sup>8</sup> The Constitution of Kenya, 2010, was adopted by the Government of Kenya on 27 August 2010. The full text is available at [http://www.kenyalaw.org/klr/fileadmin/pdfdownloads/Constitution/Constitution\\_of\\_Kenya2010.pdf](http://www.kenyalaw.org/klr/fileadmin/pdfdownloads/Constitution/Constitution_of_Kenya2010.pdf), accessed May 25, 2011.

<sup>9</sup>Constitution of Kenya, art. 40.



*“The State shall not deprive a person of property of any description, or of any interest in, or right over, property of any description, unless the deprivation—results from an acquisition of land or an interest in land or a conversion of an interest in land, or title to land, in accordance with Chapter Five; or is for a public purpose or in the public interest and is carried out in accordance with this Constitution and any Act of Parliament that –*

- (i) Requires prompt payment in full, of just compensation to the person; and*
- (ii) Allows any person who has an interest in or right over, that property a right of access to a court of law.<sup>10</sup>*

The Constitution empowers the state to exercise the authority of compulsory acquisition. Land Act 2012 (LA) designates the National Land Commission (NLC) as the agency empowered to compulsorily acquire land.<sup>11</sup> Article 40 of the Constitution provides that the state may deprive owners of property only if the deprivation is "for a public purpose or in the public interest," which includes public buildings, roads, way leaves, drainage, irrigation canals among others. The state's exercise of this power is left at the discretion of NLC, and requires the state to make full and prompt payment of "just compensation" and an opportunity for appeal to court.

Article 40(3) (a) refers to acquisition and conversion of all kinds of land in Kenya (private, public, community land and foreign interests in land). The Constitution further provides that payment of compensation shall be made to “occupants in good faith” of land acquired by the state who do not hold title for such land.<sup>12</sup> An occupant in good faith is a “bona fide” occupant. On the other hand, under the Constitution, those who have acquired land illegally are not regarded as deserving any compensation.<sup>13</sup>

In addition to Article 40, Chapter Five of the Constitution is relevant to compulsory acquisition. This chapter, entitled "Land and Environment," is divided into two parts. Part 1 deals with land, and Part 2 deals with environment and natural resources. Part 1 of Chapter 5, articles 60 – 68, describes the principles of land policy. Land should be held, used and managed in a manner that is equitable, efficient, productive and sustainable and in accordance with security of land rights, sound conservation and protection of ecologically sensitive areas.<sup>14</sup> These principles must be implemented through a national land policy reviewed regularly by the national government and through legislation.<sup>15</sup>

### **3.4.1 The Land Act (1998) (CAP 227)**

The land act <sup>16</sup>(“LA”) is the Kenya’s framework legislation regulating compulsory acquisition of land (i.e. land, houses, easements etc.). The LA was adopted on 2<sup>nd</sup> may 2012 and provides

<sup>10</sup> Id.

<sup>11</sup>The Land Act, 2012 The Government of Kenya, Section 8.

<sup>12</sup>Constitution of Kenya.Id. at art.40(5).

<sup>13</sup>Constitution of Kenya.Id. at art.40(3).

<sup>14</sup>Id. at art. 60.

<sup>15</sup>Id. at art.60(2).

<sup>16</sup> Land Act, 2012.

for sustainable administration and management of land and land-based resources including compulsory acquisition.

### 3.4.2 The National Land Commission Act

The National Land Commission (NLC), an independent government commission whose establishment was provided for by the Constitution of Kenya, 2010 to, amongst other things, manage public land on behalf of the national and county governments, initiate investigations into present or historical land injustices and recommend appropriate redress, and monitor and have oversight responsibilities over land use planning throughout the country.[1] It was officially established under The National Land Commission Act, 2012. Pursuant to Article 67 (2) of the Constitution, the functions of the Commission are:—

- To manage public land on behalf of the national and county governments;
- Compulsory acquire land for national and county governments
- Compensate acquired land on behalf of national and County government
- To recommend a national land policy to the national government;
- To advise the national government on a comprehensive programme for the registration of title in land throughout Kenya;
- To conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities;
- To initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress;
- To encourage the application of traditional dispute resolution mechanisms in land conflicts;
- To assess tax on land and premiums on immovable property in any area designated by law; and
- Monitor and have oversight responsibilities over land use planning throughout the country.

Under the National Land Commission Act, the Commission shall:

- On behalf of, and with the consent of the national and county governments, alienate public land;
- Monitor the registration of all rights and interests in land;
- Ensure that public land and land under the management of designated state agencies are sustainably managed for their intended purpose and for future generations;
- Develop and maintain an effective land information management system at national and county levels;
- Manage and administer all unregistered trust land and unregistered community land on behalf of the county government; and
- Develop and encourage alternative dispute resolution mechanisms in land dispute handling and management.
- Implement Settlement programmes on behalf of national and county governments as outlined in section 134 of the Land Act.
- Administer the Land Settlement Fund in accordance with section 135 of Land Act
- Manage the Land Compensation Fund

- Identify ecologically sensitive areas that are within public land and demarcate and take any other justified action on those areas and act to prevent environmental degradation and climate change in accordance with the Land Act.
- Reserve public land for the establishment of approved settlement programmes, and where public land is not available, purchase private land subject to the Public Procurement and Disposal Act, 2005 or any other law as provided for in section 134 (5) of the Land Act.
- Set aside land for investment purposes in accordance with section 12(3) of the Land Act.
- Approve compulsory acquisitions, wayleaves, easements and analogous rights.
- Ensure that the investments, in land benefit local communities and their economies.
- Make regulations prescribing the criteria for allocation of public land, such regulations to prescribe forms of ownership and access to land under all tenure systems.
- The procedure and manner of setting aside land for investment should respect mechanisms of benefit sharing with local communities.

As a result, NLC will compensate all affected PAPs, since legally they are the constitutional body charged with this responsibility.

### 3.4.3 The Valuation Act

Valuation of land is a critical aspect of compulsory acquisition practice and compensation. The National Land Commission based on land valuation determined by registered valuers will make compensation awards. Besides, the Valuers Act<sup>17</sup> establishes the Valuers Registration Board, which regulates the activities and practice of registered Valuers. All Valuers must be registered with the Board to practice in Kenya. The Board shall keep and maintain the names of registered Valuers, which shall include the date of entry in the register; the address of the person registered the qualification of the person and any other relevant particular that the Board may find necessary. The RAP team has made use of the services of registered Valuers who are approved by Valuers Registration Board.

### 3.5 African Development Bank Environmental Guidelines

AfDB OS 2 is a policy that provides a mechanism through which Project related resettlement issues are to be addressed. The specific objectives of this OS mirror the objectives of the involuntary resettlement policy to:

- a) Avoid involuntary resettlement where feasible, or minimise resettlement impacts where involuntary resettlement is deemed unavoidable after all alternative project designs have been explored;
- b) Ensure that displaced people are meaningfully consulted and given opportunities to participate in the planning and implementation of resettlement programmes;
- c) Ensure that displaced people receive significant resettlement assistance under the project, so that their standards of living, income-earning capacity, production levels and overall means of livelihood are improved beyond pre-project levels;
- d) Provide explicit guidance to borrowers on the conditions that need to be met regarding involuntary resettlement issues in Bank operations to mitigate the negative impacts of

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<sup>17</sup>The Valuers Act, Chapter 532, [http://www.kenyalaw.org/kenyalaw/klr\\_app/frames.php](http://www.kenyalaw.org/kenyalaw/klr_app/frames.php), accessed May 25, 2011.

displacement and resettlement, actively facilitate social development and establish a sustainable economy and society; and

- e) Guard against poorly prepared and implemented resettlement plans by setting up a mechanism for monitoring the performance of involuntary resettlement programmes in Bank operations and remedying problems as they arise

The Policy also covers economic, social and cultural impacts associated with Bank-financed projects involving involuntary loss of land, involuntary loss of other assets, or restrictions on land use and on access to local natural resources that result in;

- (a) Relocation or loss of shelter by the people residing in the project area of influence
- (b) Loss of assets (including loss of structures and assets of cultural, spiritual, and other social importance) or restriction of access to assets, including national parks and protected areas or natural resources; or
- (c) Loss of income sources or means of livelihood as a result of the project, whether or not the people affected are required to move.

AfDB OS 2 is therefore relevant to the **Namanga Dam Water Supply and Sanitation Project** as acquisition of private land is anticipated. The main features of this directive are as follows:

- (a) All viable alternative project designs should be explored to avoid or minimise the need for resettlement and when it cannot be avoided, to minimise the scale and impacts of resettlement.
- (b) Resettlement measures should include affected development activities in the affected community. The community should be assisted to improve former production levels, income-earning capacity and living standards, or at least restore them to the levels at which they would have been without the project.
- (c) Displaced persons should be:
  - Compensated at full replacement cost prior to commencement of construction;
  - Assisted with relocation; and
  - Assisted and supported during the transition period.

Physical relocation to new sites is anticipated. Therefore, PAPs should be considered for resettlement compensation at current market and replacement rates for the respective affected properties, where relevant. A 15 per cent disturbance allowance to assist the PAPs during the re-establishment transition period, including temporary loss of income, has been considered.

- (d) Vulnerable and socially disadvantaged groups should be considered in the RAP activities. These include groups such as the very poor, the disabled, minorities, refugees, orphans and child-headed families, squatters and others without clear legal rights to land, those incapacitated by advanced age, among others.
- (e) Communities should be given opportunities to participate in planning, implementing and monitoring their resettlement/compensation. This has been complied with and extensive community and stakeholder consultations undertaken. Also, the views of the community members and other stakeholders have been considered and integrated into the RAP.
- (f) Re-settlers should be helped with integration into their host community.





Table 3-2: Kenya Law vs AfDB Policy Guidelines

Kenya Law	AfDB Policy Guidelines	Recommendations to bridge gaps
Compensation for land and developments acquired for public purpose is paid for at the prevailing market price and in monetary form including an element for disturbance except where the beneficiary opts for alternative land equivalent to the value ascertained	Recommends land for land compensation. Other compensation is at replacement cost	Getting suitable land for the affected is proving challenging with time. Recommends land for land compensation. Other compensation is at replacement cost
Grievance redress mechanism is not adequately provided for	The mechanism is fully documented and the procedures laid down	Expedite the dispute resolution mechanism recently introduced by the judiciary
The Constitution of Kenya (2010), Section 60 (1) (f) seeks to eliminate gender discrimination in law, custom, and practices related to land and property.	AfDB Gender Policy (2001) reinforces the provisions of the Constitution by providing specific direction on how gender issues are to be handled in the course of the project.	This policy was adhered to during public consultation
Constitution recognizes public consultations before a project can be implemented, it does not stress on the co-operation and consultation of the Civil Society organizations.	On cooperation with Civil Society organizations, stresses on the need to consult and cooperate with the CSOs.	
Section 91 (1) of the traffic Act Cap 403, makes it an offense for any person to encroach on a road reserve by making or erecting any building, placing and advertisement sign or other obstacle, deposit any matter whatsoever, alters or obstruct any drainage under the control of highway authority without written permission from the authority. Section 91 (2) of the law further gives the authority power to remove the	Section 3.4.3 of the involuntary Resettlement policy provides for a third group of displaced persons who have no recognizable legal right on the land they are occupying in the project area. Examples According to the Policy, this category of displaced persons, will be entitled to resettlement assistance in lieu of compensation for land to sustain and improve their former living standards (compensation for loss of	



Kenya Law	AfDB Policy Guidelines	Recommendations to bridge gaps
obstruction, and the culprit is liable for prosecution.	livelihood activities, common property resources, structure and crops etc.), provided they occupied the project area prior to a cut-off date established by the borrow and acceptable to Bank. At the minimum, under the Bank's policy (with no contradiction to the borrower's legislation), land, housing, and infrastructure should be provided to the adversely affected population, including indigenous groups, ethnic, linguistic and religious minorities, and pastoralists who may have usufruct rights to the land or other resources taken for the project. The cut-off date must clearly be communicated to the project affected population. Persons who encroach on the project area after the cut-off date are not entitled to any form of resettlement assistance.	



## 4 CHAPTER FOUR: RESETTLEMENT IMPACTS

### 4.1 Introduction

The Construction of the Namanga Dam Water Supply and Sanitation Project will have resettlement impacts. The major impacts include:

- Loss of land-particularly at the dam area i.e. in Ol Doinyo Orok Forest and the WWTP site
- Loss of trees- Ol Doinyo Orok Forest comprises of mainly acacia trees and other indigenous trees that will be cut to pave way for the construction of the dam.
- Loss of crops- The families living downstream of the dam have engaged in small-scale farming and their crops are likely to be affected



Plate 4-1: Trees within the Ol Doinyo Orok Forest that will be affected by the Dam and WTP

### 4.2 Potential Impact of the Project

Affected land will be forest, residential and agricultural land. The impact will result in the permanent change of land use and the termination of the present use of the land. The direct impact of the project on PAPs in terms of the specific land parcels affected, sizes of land and affected owners will be determined during Valuation.

Table 4-1: Estimates of Affected Land Parcel for the various project components

Project Component	Acres	Ha
Dam area	64.2451	25.9996
Tank 1,3,4	0.997	0.4035
Pump station 1&2	3.5533	1.4380
WWTP	104.3822	42.2429



Access Road for Sewer	3.053	1.2355
Trunk Line	9.9235	4.0160
<b>Total</b>	<b>186.1541</b>	<b>75.3355</b>

The transmission mains and distribution lines are located along the road reserve with the aim of ensuring that there is minimal acquisition and displacement.

### 4.3 Project Affected Persons (PAPs)

Project affected persons (PAPs) are individuals whose assets may be lost and/or affected, including land, property, other assets, livelihoods, and/or access to natural and/or economic resources as a result of activities under the Namanga Dam Water Supply and Sanitation Project. During the asset inventory exercise undertaken by the Valuation team, 22 land parcels will be affected during the project implementation.

Category of impact in relations to PAPs have been identified namely;

- Project affected persons with trees
- Project affected persons with land

Generally, the design for Namanga Dam Water Supply and Sanitation Project. envisages the following disruptions and losses. Proposed against each anticipated disruption and loss is its mitigation measure(s).

#### a) Loss of Land and Proposed Mitigation Measures

The targeted project area comprises of a forested area as well as agricultural land. Loss of private land is inevitable based on the current design for the sewerage system (WWTP & Trunk lines), tank 1, 3 & 4, pumping stations and access road to the sewer. Loss of land is also expected at the Ol Doinyo Orok Forest where about 64 acres is needed for the construction of the dam and the Water Treatment Plant.

#### Proposed mitigation

- Compensate the affected persons whose private land is needed for the project implementation.

Table 4-2: Affected sizes of land to be acquired

Project Component	Acres	Ha
Dam & WTP area	64.2451	25.9996
Tank 1,3,4	0.997	0.4035
Pump station 1&2	3.5533	1.4380
WWTP	104.3822	42.2429
Access Road for Sewer	3.053	1.2355
Trunk Line	9.9235	4.0160
<b>Total</b>	<b>186.1541</b>	<b>75.3355</b>



## 5 CHAPTER FIVE: STAKEHOLDER ENGAGEMENT

### 5.1 Introduction

The overall goal of consultation and stakeholder engagement is to establish an ongoing dialogue with potentially affected parties and other interested organizations and individuals, so that their views and concerns can be taken into account in decisions about the Project. The consultation and stakeholder engagement activities of the RAP are entirely interwoven with the Project's Stakeholder Public Consultation which is provided in ESIA. In line with both the Government of Kenya and AfDB requirements, consultation with and participation of affected communities and individuals are key elements of the RAP development and - implementation process.

Another essential aspect of this participatory approach is the establishment mechanism to redress the grievances of affected people. The aims of community and stakeholder consultations were to:

- (a) Introduce Project implementation activities and potential impacts to the community members;
- (b) Identify the communal property and public infrastructure and facilities likely to be affected;
- (c) Identify the vulnerable social groups that may require special support;
- (d) Identify various socially and culturally acceptable resettlement and other mitigation alternatives;
- (e) Identify the community expectations and fears related to the resettlement compensations;
- (f) Explain to the community members the meaning of key concepts used under the RAP such as resettlement<sup>18</sup>, displacement, relocation and compensation, among others;
- (g) Explain to the community members the procedure for property identification and assessment for the PAPs

### 5.2 Stakeholder Analysis

Based on the Stakeholder identification and mapping exercise conducted under the ESIA, the primary stakeholders were specifically targeted during the RAP exercise. Table 5-1 indicates the specific interests of the various stakeholders.

Table 5-1: Analysis of the respective interests of the stakeholders

Stakeholder Name	Interest
TAWWDA	Improve the existing water system and meet the water demands in line with Vision 2030
OLWASCO	Obtaining water to supply to the public

<sup>18</sup> The concept of resettlement was explained to the PAPs as NOT only meaning physical displacement and relocation but also the loss of physical and economic assets and livelihood amenities and the necessary compensation measures to assist PAPs in restoring their livelihoods.





Stakeholder Name	Interest
<b>OWASCO</b>	Obtaining Water to supply to the public
<b>Enkokidong'oi Village Residents (dam site &amp; WTP)</b>	Understanding how the project safeguards their safety as the host community, in case of displacement, how resettlement will be undertaken.
<b>Ormankeki Village Residents (Proposed WWTP)</b>	Understanding how the project safeguards their safety and health as the host community, in case of displacement, how resettlement will be undertaken.
<b>Namanga, Maili Tisa, Ng'ataek &amp; Bisil Town centre residents</b>	Understanding how the water transmission and distribution lines might affect their livelihoods especially during the construction of the pipelines.
<b>County Government of Kajiado-</b>	Ensuring consistent water supply and sanitation needs in the county are met.
<b>KFS</b>	Ensuring the forest is not destroyed.
<b>KWS</b>	Ensuring the wild animals remain safe
<b>NLC</b>	Ensuring they acquire the land needed for the project implementation on behalf of the Government
<b>NEMA</b>	Adequate Environmental and Social Impact Assessment is undertaken before the project construction
<b>WRA &amp; WRUA</b>	Proper management and use of water resources
<b>Politicians (MCA, Ward Administrators, MP etc.)</b>	The residents within their area of jurisdiction access and enjoy amenities like water and proper sanitation
<b>Local Administration (CC, DCC, ACC, Chiefs &amp; Assistant Chiefs)</b>	Law and order are adhered to during the project implementation phases

Various stakeholders were targeted for consultation and to seek views / opinion and concerns about the project.

### 5.3 Stakeholder Sensitization on RAP Activities

The Consultant has been engaging both the primary and secondary stakeholders during the project period as indicated in the ESIA report. The local administration provided immense support in the organization of the public meetings.

For purposes of preparation of the RAP Report, the affected persons were the target audience for the awareness meetings that were held on the dates shown in Table 5-2 below. The PAPs raised several concerns and sought clarifications on various project aspects.

Table 5-2: Schedule of RAP Awareness Meetings

S/NO	Date	Venue	Target Audience
4.	8 <sup>th</sup> December 2022	First Baptist Church	PAPs at Maili Tisa and Enkokidong'oi Village



5.	4 <sup>th</sup> April 2023	Elim Full Gospel Church	PAPs along the Sewer System (Namanga and Ormankeki)
6.	5 <sup>th</sup> April 2023	First Baptist Church	PAPs at Maili Tisa and Enkokidong'oi Village

### 5.3.1 Summary of the RAP Awareness Meetings

#### a) Irrigation

The community reported that they appreciated the water for domestic use. However, they would also like a water provision for irrigation purposes as they have ranches near the dam area that can be cultivated.

TAWWDA noted the request and indicated that the water provision was beyond the scope of the project, but it will be considered as a future provision.

#### b) Water Supply Areas

The community sought information on the distribution of the domestic water to their households as the hosts of the project. They needed assurance that they would be supplied with the water because previous projects undertaken in the area made promises that were never kept.

The Consultant informed them that the current scope of works entailed designing of the dam, water transmission mains to Maili Tisa, Ngatataek, Bisil and Namanga towns. Additionally, the distribution component is limited to Namanga town. TAWWDA assured the community that once the design consultant completes their scope of works, designs for distribution would be done as the focus is to first secure the water resource i.e. the dam.

#### c) Displacement and Compensation

The Consultant's Valuer explained that displacement by projects is implemented where it is inevitable. Affected persons become eligible for compensation if their structure, trees, crops and land will be displaced. The Valuation methodology and how rates are determined was explained as well and urged the affected persons to ensure they have necessary documentation that would proof ownership of the assets such as land, lease or tenancy agreements as compensation is only done to the owners. In addition, he stated that the Consultant will undertake an asset inventory of the affected persons, but it will only be for purposes of budgeting by TAWWDA. During the project implementation, National Land Commission will be undertaking the compensation process as mandated by the Kenyan Constitution.

The community had enquired whether there would be an alternative land for mass relocation, but the Valuer explained that the constitution provides for two forms of compensation; land for land or cash for land. However, cash compensation is usually adopted.

#### d) Risk Assessment

The community enquired on whether the Consultant had taken any measures to identify the potential risks of the dam and provided for mitigation measures.

The Consultant discussed the design approaches adopted, field investigations such as the geotechnical and geophysical investigations used to ensure the stability of the dam and communicate any impending threats. He further stated that an Emergency Action Plan will be developed by the contractor indicating all the stakeholders, and their preparedness in case of



an emergency like dam break. Environmental and social risks have also been investigated and an Environmental and Social Management Plan developed that caters for the different project phases.

**e) Employment opportunities**

It was affirmed that the locals would be given first priority in employment during the construction phase of the project especially for the casual jobs. The vacant skilled labourers' positions will be advertised through the local administration to enable the locals who meet the required qualifications an opportunity for employment. Internship opportunities will also be provided to promote skill transfer to the locals.

**f) Corporate Social Responsibility (CSR)**

The Ol Doinyo Orok Community identified four projects to be considered as part of CSR during the construction phase. They include access roads, a hospital, secondary school and a storm water drainage system for the Maili Tisa Town centre. During the meetings it was reported that land for construction of the secondary school is available.

Other CSR projects that can be considered across the project area include water trough points for livestock and water kiosks.

A permanent access road will be tarmacked by the contractor to facilitate his movement during construction of the project and dam operations as well as to ease movement among the local people.

**g) Community Empowerment**

The community identified several income generation projects through its committee that would like to be considered for implementation once the project is complete. They include, bee keeping, power generation and fisheries. They also indicated that if the provision of water for irrigation is implemented they could engage in smallholder livestock feed project, domestic biogas,

A women empowerment project currently exists at Maili Tisa where they operate the Oloilali Milk Plant. The management requested for fencing of the facility to boost security or purchase of a cooler to increase their production capacity.

**h) Re-forestation**

One of the major impacts of the project is loss of trees at Ol Doinyo Orok Forest. The Consultant has recommended for the planting of trees after the project construction in order to restore the environmental status of the area. The planting of the trees will be managed by the Kenya Forest Service and can be assisted with ensuring availability of seedlings. The Consultant recommends the tree planting not to be limited to the catchment area but across the project area.

**i) Billing**

During the meetings, it was reported that the water consumers will be billed monthly for their expenditure. The community were of the opinion that the water should be provided freely. However, the Consultant informed them that to ensure project sustainability, billing must be



done. TAWWDA explained that the water tariffs are set by the Water Services Regulatory Board (WASREB).

#### **j) Existing community water projects**

At the proposed dam area, there is existing community water projects whose operations will be affected by the project. The Consultant has provided for the relocation of the pipeline located at the reservoir to be placed around the dam. However, further discussions need to be made between the management of the water projects, OLWASCO and TAWWDA to determine if they will be provided with a bulk water pipeline that is metred thus ensuring continuous supply of the commodity or an alternative approach.

#### **k) Conflicts**

The community reported that the water scarcity challenge during the dry season results in increased human-wildlife conflict. TAWWDA needs to consider putting up water points for the animals to keep them away from the dam and the human households.

#### **l) Environmental impact concerns**

The community residing along the proposed WWTP (Ormankeki village) enquired on whether they would be affected by the smell from the WWTP. Additionally, in case of leakages along the trunk line, to whom do they report and how fast will the response be to avoid cases of contamination and risk of diseases?

The Consultant informed the community that the environmental recommendations include having a buffer zone where trees will be planted to contain the smell. OLWASCO will be managing the Sewerage system, therefore communication channels such as a hotline will be provided to the locals for reporting any incidents such as leakages.

### **5.4 Recommendations on Future Engagements**

Following the feedback from the stakeholders, below are the recommendations that the Consultant has made for TAWWDA's consideration during the implementation of the next phase of the project.

- i. The Ol Doinyo Orok Community (dam area) and the Ormankeki Community (Sewer area) formed their respective committees whose role is to provide support, help the community in decision making and general monitoring the project implementation. We recommend training of the committee members and organization of benchmarking trips to previously completed projects to help them perform their roles better.
- ii. The Affected Persons who have been identified as being eligible for compensation need to be taken through financial training before they are compensated. The financial knowledge will help them to properly utilize the awards to improve their wellbeing.
- iii. The Consultant has provided for offtakes along the transmission lines to Namanga, Ngatataek and Bisil. During the design of the distribution system, provision of water for livestock should be considered and water trough points provided within the project area.
- iv. In addition, the hosts of the WWTP and the trunk line need to be supplied with domestic water. This will help in promoting project acceptance.







PAP sharing his concerns during the RAP Awareness meeting



MCA Matapato South Ward sharing his remarks during the RAP Awareness meeting  
*Plate 5-1: RAP Awareness meeting held on 8th December 2022*





RCG Sociologist explaining the targeted water supply areas  
*Plate 5-2: RAP Awareness meeting on 4th May 2023*





RCG Project Engineer addressing the audience during the meeting

*Plate 5-3: RAP Awareness Meeting on 5th May 2023*



## 6 CHAPTER SIX: VALUATION METHODOLOGY AND STRATEGY

### 6.1 Introduction

Property valuation in Kenya is carried out by valuation professionals registered under the Valuers Act Cap. 532 of the laws of Kenya. A registered Valuer (with Valuers Registration Board) is a trained professional who has a thorough knowledge and understanding of the factors that create, maintain, or diminish values of real estate or assets. Valuation of assets is done in accordance with the Practice Statements and Guidance Notes published by the International Valuation Standards Committee (IVSC), adopted and recognized by international accounting standards and risk management professionals.

### 6.2 Valuation Methodology

#### 6.2.1 Comparative Sales Method (Market Comparables Approach Method)

This is the most realistic of all valuation methods. It is based on the comparison of the property to be valued with similar properties and the prices achieved from them, taking account of the differences between them. The comparability of the properties is based on the use of the property, location (characteristics of the neighbourhood), site area, site conditions, physical properties of the building (floor area, building materials used, amenities such as garage, etc.), and income related factors. The data to come up with an estimate market value is normally obtained from local land agents, Valuers, government departments, and other sources as necessary. Comparability is usually in respect of property transaction prices and market conditions. Each of these aspects has to be thoroughly analysed before accepting the method. The intention is to compare similar properties. For instance, agricultural land in one county may not be the same in another county, nor can residential property be compared with an industrial property.

This method of valuation is particularly constrained because of the general lack of market transactions. In some instances, property transactions are fairly secretive due to the controlled nature of the property market. Additionally, sales data often become historic due to effects of hyper-inflation making comparable sales analysis difficult.

The land estimate value in our case is based on Market Rate (commercial rate) according to Kenya law for sale of land or property. In terms of land, this may be categorized as follows;

- (a) Replacement cost for agricultural land: means the pre- program or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land,
- (b) Plus the costs of preparing the land to levels similar to those of the affected land; and
- (c) Any registration and transfer taxes; P-9

### 6.3 Valuation Strategy

The valuation report provides a strategy for resettlement compensation to ensure that the PAPs livelihoods are restored and/or improved before the land for the planned construction of the *Namanga Water and Sanitation project* is finally acquired. The strategies employed during the valuation of the access road are discussed below.





### 6.3.1 Valuation of Land

We first established the size of land to be affected and then we used the comparables sales data for recently sold land in the vicinity of the affected land. Comparable sales data was obtained from land sales agent in Namanga, fellow Valuers, chiefs and headmen in areas affected by the project, Kajiado Lands Registry, among other land dealers. This sales data was then adjusted and used to compute the compensatable amount for the affected land.

### 6.3.2 Valuation of Houses and Other Structures

In the valuation of houses and other structures, the following aspects were taken into consideration:

- The market cost of the materials to build a replacement structure with the area and quality similar to or better than those of the affected structure, or to repair a partially affected structure,
- Plus, the cost of transporting building materials to the construction site,
- Plus, the cost of any labour and contractors' fees, plus the cost of any registration and transfer taxes

**NB:** The proposed project does not affect structures hence no value has been assigned to them.

### 6.3.3 Valuation of Trees and/or Crops

For valuation of trees and/or crops, we relied on comparable data from various actors involved in compensation where similar projects have been conducted including Kenya Agricultural Research Institute (KARI) now Kenya Livestock and Research Foundation (KALRO), Department of Agriculture in the Ministry of Agriculture, Livestock and Fisheries, Rural Electrification & Renewable Energy Corporation (RE & REC), National Irrigation Authority (NIA), etc. Further, Under Kenya Resettlement Policy Framework 2017, trees and crops are supposed to be compensated using the guidelines from the Ministry of Agriculture and Kenya Forest Service.

**NB:** We did not assess the value of trees for the Kenya Forest Service land since we did not get access to the land. Further, most of the trees and/or crops along the project corridor are seasonal hence farmers/PAPs can be given adequate time to harvest.

## 6.4 Valuation cost

A field survey undertaken between 3<sup>rd</sup> April 2023 -10<sup>th</sup> April 2023 that sought to take an inventory of the affected assets within the project area as per the design, it was found that the major impact is loss of land at the proposed dam area and the sewerage system area.



Table 6-1: Estimates of Affected Land Parcel for the various project components

Project Component	Affected Land Parcel in Acres	Affected Land Parcel in Ha	Total Compensation Cost (Inclusive of Disturbance Allowance (KES)
Dam area	64.2451	25.9996	73,881,888
Tank 1,3,4	0.997	0.4035	1,819,341
Pump station 1 & 2	3.5533	1.4380	8,494,996
WWTP	104.3822	42.2429	240,079,160
Access Road	3.053	1.2355	5,266,467
Trunk Line	9.9235	4.0160	36,069,902
<b>Total</b>	<b>186.1541</b>	<b>75.3355</b>	<b>365,611,755</b>

Table 6-2: Summary of total valuation costs

	ASSETS CATEGORY	MARKET VALUE (KSHS)	ADD 15% DISTURBANCE ALLOWANCE (KSHS)	TOTAL VALUE (KSHS)
1	Land (186.15 Acres)	317,923,265.00	47,688,490.00	365,611,755.00
2	10% Contingency Sum			36,561,175.52
	<b>GRAND TOTAL</b>			<b>402,172,931.00</b>





## 7 CHAPTER SEVEN: COMPENSATION AND RESETTLEMENT STRATEGY

### 7.1 Introduction

The Kenya Constitution 2010 allows the government and local governments to acquire land for the purpose of community betterment or the public interest. The assessment for compensation under this RAP is, therefore, statutory and all steps have been taken to comply with the statutory provisions.

This is also in relation to the AfDB OS 2 procedures that spell out who is entitled to resettlement compensation as a result of involuntary displacement due to development projects. AfDB Policy is clear that both economic and social considerations should be taken into account when determining the requirement for compensation. Categorisation under the Policy is shown in the table below:

Table 7-1: Eligibility Criteria for Entitlement

No	Category of PAP	Entitlement
1	Displaced population having legal rights to land and assets	Full compensation for loss of land and assets
2	Displacement of population who can prove entitlement under country's customary laws	
3	Displaced persons with no recognized legal rights or claim to the land occupied	Resettlement assistance in lieu of compensation for land
4	All adversely affected population including indigenous groups, ethnic, religious, linguistic minorities, and pastoralists who may have rights to the land or other resources affected by the Project	Land, housing and infrastructure so long as it is not a contradiction to the borrower's legislation

### 7.2 Compensation Principles

The compensation principles to be followed are derived from the national legislation and the financiers guidelines on involuntary resettlement. These principles, including the valuation procedures, were all explained to the PAPs and other community members during the community dialogues and stakeholder consultations

- Resettlement and compensation of PAPs will be carried out in compliance with relevant Kenyan laws and financier standards.
- All PAPs physically or economically impacted shall be adequately, promptly and equitably compensated before the commencement of works at the project-affected sites. All efforts will be taken to provide necessary assistance for PAPs to restore their livelihoods.
- The Project will consider a 15 per cent disturbance allowance as stipulated in the Kenyan law in addition to the assessed compensation values for affected property.
- In consideration of the differences between national legislation and the financiers on Involuntary Resettlement, the higher of the two standards will be followed, where it best applies in this RAP, since this approach also satisfies the requirements of the lesser standard.



### 7.3 Eligibility for Compensation

Eligibility in this report is used in the context of the person that is entitled to or qualifies for any of the following provisions: compensation, resettlement, and rehabilitation assistance. Under this report, a person is determined amongst those that have qualified for any of the identified provisions when s/he meets in full the following conditions:

- a) Part or whole parcels of his or her land is tagged for compulsorily acquisition for the effective implementation of the Project;
- b) S/he occupied this land earmarked for project activities, prior to the cut-off date – i.e. the date recommended for the census.
  - The entitlement ‘cut-off’ date refers to the time when the census and assessment of PAPs and their property in the project area were carried out and ended. This was explained to the community members and PAPs during community dialogues and the PAP census. Thereafter, no new cases will be entertained for compensation.
- c) His or her rights or claim to the tagged land falls into any of the following categories:
  - Formal legal rights to land as recognised by the national and customary Laws of Kenya. Persons considered here are those that hold leasehold land, freehold land and, land held within the family or passed on through generations.
  - No formal legal rights to the land or assets at the time the census begins, but has recognised claim of use of such land or ownership of assets through the national and customary Laws of Kenya. Persons taken into account here are those that come from outside the country and have been given land by the local dignitaries to settle, and or to occupy.

No recognisable legal rights or claim to the land s/he is occupying, using or getting his or her livelihood from. Persons allowed under this considered here include encroachers and illegal.

#### 7.3.1 Cut-off date

The entitlement ‘cut-off’ date refers to the time when the census and assessment of PAPs and their property in the project area were carried out and ended. Since the census survey done by the Consultant is purely for budgeting purposes, no cut-off date was set.

However, during the actual acquisition that will be undertaken by National Land Commission (NLC), a cut-off date will be established and gazetted.

#### 7.3.2 Cash Compensation

This is the main strategy for property and income restoration where loss of land will be the main impact. This strategy will be through adequate and prompt monetary compensation and will apply to all the PAPs. This strategy will include cash compensation for land to enable PAPs to restore their livelihoods.



Table 7-2:Entitlement Matrix

#	Type of Loss	Unit of Entitlement persons	Entitlements
• <b>A. Loss of Residential/ Land</b>			
1	Partial loss of land but residual is viable	(a)Titleholder	<ul style="list-style-type: none"> <li>• 100% Cash compensation for loss at replacement cost</li> <li>• 15% cash top up in compulsory acquisition</li> <li>• Cash compensation for standing assets</li> <li>• Administrative charges, title fees, or other legal transaction costs</li> <li>• Money Management training</li> </ul>
		(b)Tenant	<ul style="list-style-type: none"> <li>• Cash compensation for standing assets</li> <li>• Administrative charges or other legal transaction costs</li> </ul>
		(c) Lease holder	<ul style="list-style-type: none"> <li>• One-month notice to vacate</li> <li>• Money Management training</li> </ul>
		d) Informal Settlers	<ul style="list-style-type: none"> <li>• Cash compensation for standing assets</li> <li>• One-month notice to vacate</li> <li>• Money Management training</li> </ul>
2	Entire loss of land or partial loss where residual is not viable	(a)owners	<ul style="list-style-type: none"> <li>• 100% Cash compensation for entire land holding at replacement cost</li> <li>• Replacement cost for standing assets erected by the Land Owner</li> <li>• 15% cash top-up in compulsory acquisition</li> <li>• Administrative charges, title fees, or other legal transaction costs</li> <li>• Money Management training</li> </ul>
		(b)Tenant (either residential or business)	<ul style="list-style-type: none"> <li>• Replacement cost for standing assets</li> <li>• Administrative charges or other legal transaction costs for registered leases</li> </ul>
		(c)Lease holders	<ul style="list-style-type: none"> <li>• One-month notice to vacate</li> <li>• Money Management training</li> <li>• Relocation assistance</li> </ul>

#### 7.4 Public Disclosure

PAPs will be given an opportunity to review the census survey and valuation results as well as the compensation policies through a binding disclosure prior to actual compensation.

#### 7.5 Livelihood Improvement Program

The aim of the livelihood restoration program in RAP is to enable PAPs to fully restore their livelihoods and improve living standards through capacity building for more profitable and



sustainable use of livelihood assets through capacity building for the establishment of alternative sources of livelihood.

Consultations between the Consultant and the community within the project area proposed the following livelihood improvement projects that can be implemented as part of Corporate Social Responsibility.

- Construction of a secondary school
- Construction of hospital or a dispensary
- Tarmacking or improvement of existing roads
- **Financial Training for Sustainable Use of Cash Compensation**

This is an important aspect of the livelihood restoration program to ensure that the Project does not live the affected worse off. Although cash compensation seemed to be the most preferred, experience has shown that it could be detrimental to the household members particularly female and children. The Project provides for measures to support sustainable use of cash compensation and for mechanisms within the overall monitoring framework to follow up the use of cash compensation. Proposed financial training for affected households that receive cash compensation will focus on:

- Assistance for opening and management of a bank account;
- Financial planning for the household;
- Planning of investments related to the household's participation in livelihood restoration programs;
- Saving strategy;
- Management of existing debts;
- Households will be required to enrol for this training when they sign off the compensation agreement. Both spouses/all partners shall participate in the training. Training will start in advance to the disbursement of compensation and be continued for a period of 1 year. The management of cash compensation will be integrated into the overall monitoring program.



## 8 CHAPTER EIGHT: GRIEVANCE REDRESS MECHANISM

### 8.1 Introduction

Grievances are any complaints or suggestions from the project affected persons about the way a project is being implemented. Grievances and complaints could arise with regards to land expropriation, resettlement, activities associated with the construction project activities, social issues or any other subject related to the project. For effective implementation of the project, grievances and complaints should be redressed throughout the lifetime of the project. The Grievance system will be applied across the various project components. It is important that the grievance committee is fully accessible to all PAPs with grievances. In addition to establishing formal procedures, grievance mechanisms should also work through existing traditional processes.

### 8.2 Grievances Procedure

In line with IFC requirements, the Grievance management provides for three tiers of amicable review and settlement, with the first tier at the site level, second level will integrate a mediation committee in case the grievance cannot be solved at first level and finally there will be an option for each of the complaint to resolve to the court of law (third level) in case there is no resolution of the grievance with the mechanism.

The first tier will comprise of a Grievance Redress Committee whose members include:

- Project Ad-Hoc committee (PAP's representatives)
- Village elder
- Chiefs and Assistant Chiefs
- A representative of groups e.g. the religious groups, business groups, youth and women groups
- TAWWDA representative
- Contractor representative
- Supervising engineer representative

The second tier involves a Mediation Committee whose members will include representatives from:

- Project Ad-Hoc Committee (PAP's representatives)
- National Government representative
- County Government representative
- TAWWDA representative
- Contractor representative
- Deputy County Commissioner/Assistant County Commissioner

### 8.3 Grievance Mechanism

A PAP will report a complaint at the grievance desk that will be set up at the Contractor's office. The Contractor's sociologist/grievance officer will record the complaint in the grievance record and the Grievance Redress Committee will investigate and evaluate the nature of the





complaint and provide a solution to the PAP within 14 days. The Contractor's sociologist/grievance officer will communicate the solution to the PAP agree on a timeframe for implementing the corrective action.

If the Grievance Redress Committee cannot find an amicable solution, the matter is raised to the Mediation Committee for resolution. Additionally, if the PAP is dissatisfied with the solution provided, they can present the grievance to the Mediation Committee who will be expected to provide a solution within 14 days. The Contractor's sociologist/grievance officer will communicate the solution to the PAP agree on a timeframe for implementing the corrective action. A Written agreement to proceed with the corrective action will be sought from the complainant and once the corrective measure is implemented, the complainant will sign the grievance log as a means of verification.

If the PAP remains dissatisfied with the solution provided, they are free to implement the third tier of Grievance Redress, which is filing a case at the court of law.

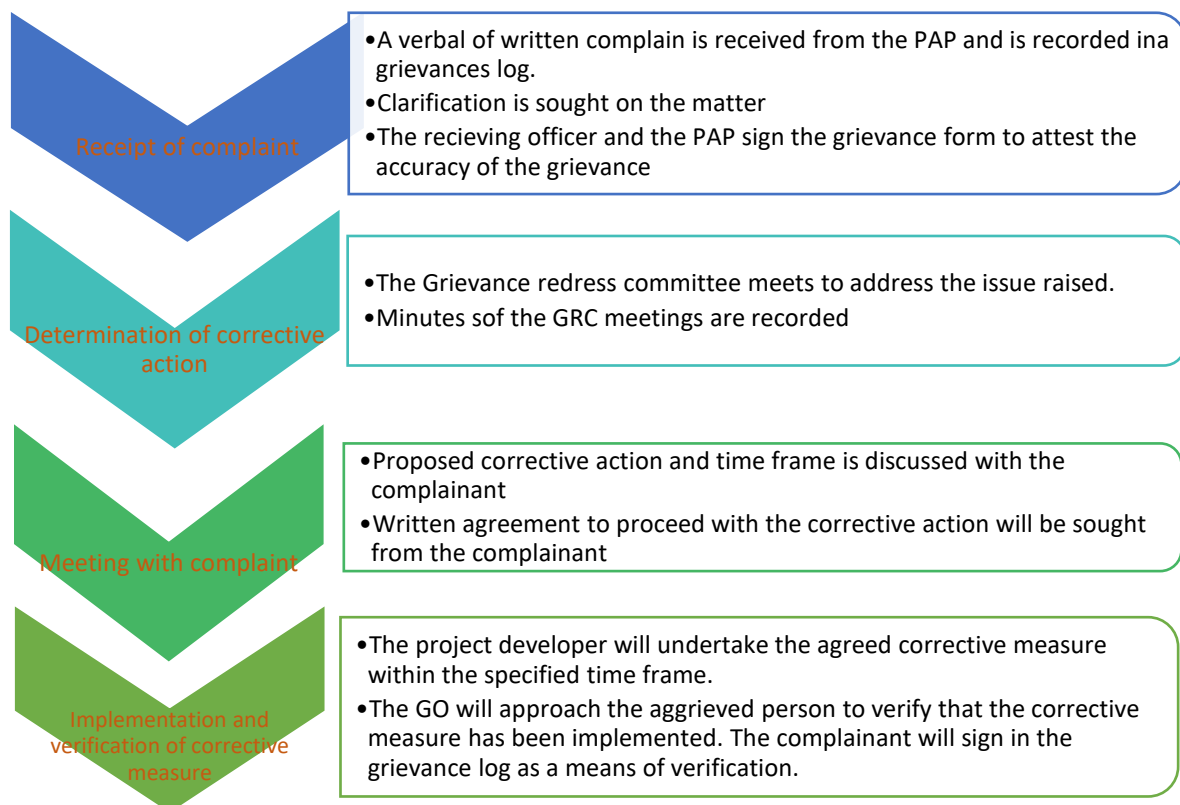


Figure 8-1: Summary of the proposed Grievance Redress Mechanism

The filing of grievances for accurate record keeping is important. The complainant if not able to write the complaint can be assisted by a local leader (preferably who is also a member of the Committee) to the complaints office to file the complaint that thereafter is entered into the register. Once a complaint is received at the complaints desk in the project office, it is registered and given a reference number for ease of following up. The Office will evaluate the application and determine whether the issue can be handled administratively or the Committee has to meet over the matter.

Where the Committee has to be convened, all its proceedings are recorded and minutes prepared of the deliberations. The minutes have to be confirmed at the next meetings and authenticated by the full sitting. All the signed minutes and the resolutions of the GRC are implemented as agreed and without delay so as not to impact negatively on the project implementation plan. Some issues that arise in-course of the project implementation are dealt with as they arise.

#### **8.4 Role of Grievance Redress Committee**

The main function of the Grievance Redress Committee is to provide a forum for the PAPs to air their dissatisfaction arising from the compensation or implementation process of the project. This is an informal forum within the Resettlement Committee to fast-track addressing of emerging issues in a project that can derail a smooth implementation of a project.

- The Committee is to receive complaints from the PAPs through the project office either verbally or in writing and they endeavour to address the issue to the satisfaction of the complainant.
- The Redress Committee will compile registers of all complaints received from the PAPs at the Contractor's office, the actions taken and the decisions arrived at.

#### **8.5 Role of PAP's Representatives in Grievance Redress Committee**

The PAPs officials headed by a Chairman elected by the PAPs shall carry out the following responsibilities as regards redressing grievances: -

- (i) Hear the grievances of the PAPs and provide an early solution to those they are able to;
- (ii) Immediately bring any serious matters to the attention of the Grievance Redress Committee; and
- (iii) Assist in informing the aggrieved parties about the progress of their grievances and the decisions made by the Grievance Redress Committee.

## 9 CHAPTER NINE: RAP IMPLEMENTATION

### 9.1 RAP Implementation Principles

The main objective of resettlement and compensation is to ensure that the PAPs receive due diligence fairly and promptly in regards to compensation. In this way it is expected that their income, production capacity and standard of living will be improved, or at least restored to their former levels. The guiding principles for the implementation of the RAP will be as follows:

- (a) Resettlement or relocation has been minimised by taking into consideration all possible alternative measures;
- (b) Compensation will be paid before project works start in a specific project area and in a manner that does not curtail the livelihoods of the PAPs in terms of access and utilisation of such compensation;
- (c) The compensation values awarded will be fair enough to restore the livelihoods of PAPs;
- (d) The compensation awards will be paid out according to the preference of the PAPs;
- (e) A statutory disturbance allowance of 15 per cent of the compensation value will also be included;
- (f) All other activities related to the RAP will be communicated in advance to the PAPs using the preferred channels of communication;
- (g) Where grievances arise, the respective PAPs will be given an opportunity to be heard, fairly and promptly;
- (h) Measures will be taken to ensure that vulnerable groups get special assistance and support; and where spousal and children consent is needed, the provision will be enforced.

### 9.2 RAP Implementation Arrangements

#### 9.2.1 Rap Implementation Unit

All PAPs will be compensated before clearance for construction commences -implying that compensation will be paid before project works start at a specific site/in a specific area as per the contractor's work schedule.

Client will be the lead agency in the RAP implementation and will work together with the County and National Governments in the PA to implement the RAP. TAWWDA will establish a RAP Implementation Unit (RIU), to implement this RAP. Therefore, it will bear the responsible for ensuring that PAPs promptly access their compensation entitlements and that their livelihoods are restored/improved after resettlement.

The RAP implementation team will be responsible for:

- (i) Delivery of the RAP compensation and rehabilitation measures;
- (ii) Appropriate coordination between the agencies and jurisdictions involved in the RAP implementation; and
- (iii) The measures (including technical assistance) needed to strengthen the implementing agencies' capacities for managing the facilities and services provided under the project.



### 9.2.2 Rap Implementation Unit Structure

The RIU will comprise a core unit responsible for day-to-day operations and technical support staff. The composition of the core unit will be as follows:

- a) An implementation team that will have the following members of staff:
  - Implementation Manager (1); TAWWDA Technical Manager
  - Implementation Officer (1); TAWWDA Social Specialist
  - Monitoring Officer (1); TAWWDA M&E Specialist
  - Administrators (3); one of the administrators can be the designate Grievance Officer.
- b) Valuer (1);
- c) Independent civil society organization/ NGO representative (1);
- d) National Government Representatives (Chiefs)
- e) County Government Representatives (CECM).
- f) Representatives of PAPs in the affected sites
- g) National Land Commission

The day-to-day role of the RAP implementation team will be to:

- a) Plan and coordinate prompt compensation payments;
- b) Plan and coordinate non- compensation issues such as special assistance to vulnerable groups;
- c) Ensure that the compensation process and entitlements adhere to legal provisions such as spousal and children's consent where it applies, and following the succession Act in case of the death of a PAP;
- d) Report to the TAWWDA senior management team and stakeholders;
- e) Ensure that the information needs of the PAPs are disseminated promptly and effectively;
- f) Establish, manage and update the RAP implementation database;
- g) Contribute to the regular monitoring and evaluation of the RAP implementation; and
- h) Consult and sensitize sensitise the community and PAPs with regard to the RAP implementation progress.

### 9.3 Payment Procedure

Payment of compensation will be guided by The National Lands Commission (NLC) under the NLC Act 2012. All compensation payments will be made through designated bank accounts of PAPs. PAPs without bank accounts will be assisted to open up bank accounts. Payment of compensation will follow the prescribed procedure outlined in the NLC Act.

### 9.4 Schedule of Implementation

The relevant stakeholders i.e. Client RAP implementation team and NLC will develop the schedule for the implementation of activities. The implementation schedule will include:

- (a) target dates for the start and completion of compensation payments;
- (b) timetables for and the place of compensation payments;
- (c) target dates for fulfilling the prerequisites for compensation payments and other legal requirements by PAPs;



- (d) the time table for special assistance to vulnerable groups;
- (e) dates for vacant possession of the acquired land from the PAPs (this date must be after the payment of all compensation); and
- (f) The link between the RAP activities to the implementation of the overall sub-project components.

## 9.5 RAP Budget

The budget for implementation of RAP comprises of the cost of acquiring land and the estimated cost of forest material (i.e. trees that will be harvested to allow for construction of the dam, WTP, raw water main). The estimated RAP budget for all components is summarised in Table 9-1. Table 9-2 and 9-3 provide the separate RAP budgets for Dam & Water Transmission and the Sewerage System respectively.

Table 9-1: Estimated RAP Budget for all Components (Dam, Water Transmission & Sewerage System)

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition + forest material	402,172,931
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>402,482,931</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	40,248,293
	<b>Total Cost 2</b>	<b>442,731,224</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	55,341,403
	<b>GRAND TOTAL</b>	<b>498,072,627</b>

Table 9-2: Estimated RAP Budget for Dam & Water Transmission

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition	149,437,283
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>149,747,283</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	14,974,728
	<b>Total Cost 2</b>	<b>164,722,012</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	20,590,251
	<b>GRAND TOTAL</b>	<b>185,312,263</b>





Table 9-3: Estimated RAP Budget for Sewerage System

	BUDGET ITEM	AMOUNT (KSHS)
<b>1</b>	<b>Payment of compensation</b>	
	Land acquisition	281,415,530
<b>2</b>	Notification to title holders and general public*	310,000
	<b>Total Cost 1</b>	<b>281,725,530</b>
<b>3</b>	Cost of implementation of RAP including Grievances redressing (10%)	28,172,553
	<b>Total Cost 2</b>	<b>309,898,083</b>
<b>4</b>	<b>Contingency (at 12.5% of the Total Costs 2)**</b>	38,737,260
	<b>GRAND TOTAL</b>	<b>348,635,343</b>

\*The cost will also include a 10 per cent each for administration cost for the RAP implementation, which included the cost of conveyance, financial management training and monitoring and evaluation.



## 10 CHAPTER TEN: MONITORING, EVALUATION SYSTEM AND COMPLETION AUDIT

### 10.1 General Objectives of M&E

The purpose of monitoring and evaluation is to report on the effectiveness of the implementation of the RAP, and the outcomes and impact of compensation on the PAPs in relation to the purpose and goals of the RAP. This section describes the Monitoring and Evaluation (M&E) system for the RAP and also describes the parameters and associated indicators to be monitored, and the monitoring milestones and resources, including the persons or institutions responsible for carrying out the monitoring activities. Monitoring Officer will be part of the RAP implementation team.

The general objective of the M&E system is to provide a basis for assessing the overall success and effectiveness of the implementation of the resettlement and compensation processes and measures. A number of objectively verifiable indicators (OVIs) will be used to monitor the impacts of the compensation and resettlement activities. These indicators will be targeted at quantitatively measuring the physical and socio-economic status of the PAPs, to determine and guide improvement in their social wellbeing. The following parameters will be used to guide the measurement of the RAP performance:

- (a) Each PAP will have a digitised compensation file/record indicating his/her background situation before RAP, the compensation agreed upon and received, the impacts on land and property, the use of assets/improvements after RAP etc. This data will be entered into a database for comparative analysis at all levels;
- (b) The mode of compensation preferred by PAPs and used by the RIU;
- (c) The use of compensation payments and other resettlement assistance by PAPs;
- (d) The grievance handling outputs and outcomes for respective PAPs;
- (e) The number of grievances and the time and quality of resolution;
- (f) PAP's ability to re-establish their livelihood activities and property, including alternative incomes; and
- (g) New livelihood activities established and the productivity of such livelihoods at household and community levels;

The M&E will be undertaken at two levels:

- (i) **Internal monitoring:** This will be undertaken regularly by the RIU/Monitoring Officer; and,
- (ii) **External evaluations** (or end of time of RAP implementation): Evaluation will be undertaken by an independent consulting firm hired by TAWWDA. Evaluation will be necessary in order to ascertain whether the livelihood and income restoration goals and objectives have been realised.

### 10.2 Monitoring the Compensation Process

#### (a) Internal Monitoring Issues

The effectiveness of the RAP implementation process and activities will be monitored through internal monitoring. This will be undertaken by the client's Monitoring Officer and will involve monitoring of the compensation process and activities to ensure that effectiveness is achieved throughout the RAP implementation

Internal monitoring will be thematically carried out at two process levels; during the resettlement compensation payment period and after that period (post-compensation payment period). Each process/thematic period will have different monitoring issues which the M&E officer should pay attention to, as summarized in **Table 10-1** below.

*Table 10-1: Monitoring Thematic Issues during and after Compensation Payments*

Thematic periods	
Resettlement compensation payment period	Post-resettlement compensation payment period
<ol style="list-style-type: none"> <li>1. Number of PAPs compensated</li> <li>2. Number of PAPs who have acquired legal papers to new property</li> <li>3. Number of PAPs who have registered grievances with the GO</li> <li>4. Number of PAPs whose grievances have been resolved</li> <li>5. Number of vulnerable PAPs or groups identified and assisted during compensation payments</li> </ol>	<ol style="list-style-type: none"> <li>1. Number of PAPs with successfully restored livelihoods and assets,</li> <li>2. Number of PAPs who have maintained social and cultural ties,</li> <li>3. No of PAPs whose grievances have been resolved or otherwise,</li> <li>4. Number of vulnerable groups assisted and restored livelihood enterprise and assets.</li> </ol>

### (b) Roles and Responsibilities

The roles and responsibilities of the Monitoring Officer must be seen to directly contribute to the objectives of the internal monitoring process. The roles and responsibilities will involve:

- (i) Setting up a system to collect, on a monthly basis, basic demographic and livelihood data about PAPs and having this data entered into a database for M&E;
- (ii) The identification and improvement of indicators to measure the RAP performance;
- (iii) The measurement of indicators at appropriate intervals;
- (iv) Collecting and analyzing data against pre-compensation baseline information to be able to track and isolate changes in the livelihoods of the PAPs;
- (v) Setting up a system to enable the RIU to use M&E findings to improve or modify existing implementation measures or processes;
- (vi) Maintain in good order and regularly updating the M&E database;
- (vii) Receiving information from other officers in the RIU, from the general community, from technical and political officers from sub-counties;
- (viii) Giving feedback to other officers in the RIU, stakeholders and representatives through monthly reports and disseminations;
- (ix) Training and supervising locally recruited enumerators to collect data from the PAPs; and



- (x) Undertaking specialized assessment for vulnerable PAPs and suggesting necessary interventions for such groups.

**(c) Monitoring Indicators**

The relevant monitoring indicators against which to measure the RAP implementation effectiveness are presented in **Table 10-2** below. A monitoring form will be used for this purpose.

*Table 10-2: Proposed Monitoring Indicators*

Activity/Parameters	Indicators
Compensation payments to PAPs	Number of PAPs promptly paid Number of PAPs not paid promptly and reasons Amounts of money paid to PAPs
Community participation and public engagement	Number of local consultative meetings held Number of County and National Government leaders engaged/briefed about the RAP Number of Civil Society representatives engaged/briefed about the RAP Number of PAPs consultative meetings held
Grievance management	Number of grievances received Number of grievances resolved promptly (in allowed time) Number of grievances not resolved in time but completed Number of outstanding grievances not resolved Number of grievances referred Nature of outcomes from referred grievances
Mutation and registration of land rights	Number of mutation forms signed by PAPs Number of land titles received Number of land titles processed and returned to owners Number of land titles not processed and why Number or percentage of encumbrances entered on PAPs titles



### 10.3 External evaluation

TAWWDA will initiate the process of external evaluation collaboration with other national stakeholders. To avoid conflict of interest, the external evaluation will be undertaken by an external evaluation agency. The external evaluation will also be thematically undertaken at two levels and will examine the RAP implementation effectiveness and outcomes as outlined in **Table 10-3**.

*Table 10-3: External Evaluation Thematic Issues*

Thematic Issues	
Process indicators that measure the effectiveness of the RAP implementation process	Outcome indicators (the main design of outcome evaluation will be a pre- and post-compensation comparative analysis)
<ol style="list-style-type: none"> <li>1. Adequacy (of staff number/skills/knowledge levels; equipment and facilities) at RIU</li> <li>2. Legislative compliance with national and AfDB OS 2 standards</li> <li>3. Outputs of the M&amp;E, compensation payments, community engagement, reporting, grievance processes as indicators of effectiveness and adequacy</li> <li>4. Collaboration and coordination adequacy of the RIU</li> </ol>	Livelihood changes among PAP households, including production systems and the standard of living and welfare

### 10.4 RAP Completion Report

TAWWDA will at the end of the RAP implementation submit a final report to the project financiers. The final report will indicate the effectiveness of the RAP implementation process, including: the organisation and delivery of compensation payments and other resettlement measures; the grievance handling system; the M&E system; the community and public engagement, including vulnerable groups; and the socio-economic impacts of the resettlement measures. The final report will give an overall assessment of the RAP outputs against inputs indicating the planned activities completed and not completed as well as the lessons learnt during the RAP implementation.

### 10.5 Completion Audit

The completion audit is intended to verify the results of the RAP implementation indicators, and to assess whether the RAP implementation achieved the resettlement objectives. A specific question for the final audit is whether livelihood and living standards have been restored or enhanced. If the answer is positive, then the RAP implementation will be considered to be completed. The RPF notes that the audit will also assess the efficiency, effectiveness, impact and sustainability of the RAP sub-project activities and document the lessons learnt for application to future sub-projects or other projects in the sector and in the country. Finally, the





completion audit will ascertain whether the resettlement entitlements were appropriate, TAWWDA will submit the completion audit report to the Project Financiers for review and appropriate action. The client will be responsible for sourcing of and assigning to competent firm(s) the undertaking of the completion audit.



## **11 References**

Sessional Paper No. 3 of 2009 on National Land Policy (referred to as the “National Land Policy” in this report) was adopted in August 2009 by the Ministry of Lands. Available at

[http://www.lands.go.ke/index.php?option=com\\_content&task=view&id=238&Itemid=48](http://www.lands.go.ke/index.php?option=com_content&task=view&id=238&Itemid=48), accessed May 25, 2011.

The Constitution of Kenya, 2010, was adopted by the Government of Kenya on 27 August 2010. The full text is available at

[http://www.kenyalaw.org/klr/fileadmin/pdfdownloads/Constitution/Constitution\\_of\\_Kenya2010.pdf](http://www.kenyalaw.org/klr/fileadmin/pdfdownloads/Constitution/Constitution_of_Kenya2010.pdf), accessed May 25, 2011.

## **12 Appendix**

### **12.1 Attendance List and Minutes of meetings**

## **12.2 Letters of Invitation to meeting**

### **12.3 Questionnaire used during Household Survey**



## **Annex**

### **Valuation Report**



## TANATHI WATER WORKS DEVELOPMENT AGENCY

### CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECT

CONTRACT NO. TAWWDA/028/2020-2021



## Valuation Report

May 2023

**Runji Consulting Group**   
Engineering & Project Management  
P.O Box 68053-00200  
Nairobi, Kenya

Internal Quality Control

Revision	Purpose description	Originated	Checked	Reviewed	Authorized	Date
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## Definition of Terms:

### a) Market Value:

The market value (MV) means the best price at which the sale of an interest in property might reasonably be expected to have been completed unconditionally for cash consideration on the date of valuation assuming; -

- a willing seller;
- That, prior to the date of valuation, there had been a reasonable period (having regard to the nature of the property and the state of the market) for the proper marketing of the interest, for the agreement of price and terms and for the completion of the sale;
- That the state of the market, level of values and other circumstances were on any earlier assumed date of exchange of contracts, the same as on the date of valuation; and
- That no account is taken of any additional bid by a purchaser with a special interest.

The market value reflects continuation of the existing use and the value may include a special element attributable to the earning potential of the premises for a particular existing purpose by reason of their nature, location, character and physical construction but such element of value, if present, exists irrespective of the benefit for the property to the particular individual undertaking of which it forms a part.

### b) Disturbance Allowance:

This refers to the amount of statutory compensation equal to fifteen per cent (15%) of the market value (Value of land and improvements only) as a way of compensation for disturbance.

The idea is to put the owner in a position to reinstate himself on other land so as to be able to carry on his activities unaltered and undiminished (equivalent reinstatement).

The Land Act No.6 of 2012 gave the National Land Commission to make rules to regulate the assessment of just compensation.

The Land (Assessment of Just Compensation) Rules 2017 provides that the Commission shall add a sum equal to fifteen per cent of the market value to the amount of compensation as compensation for disturbance.

# 1 INTRODUCTION

## 1.1 Background Information

Tanathi Water Works Development Agency (TAWWDA), an implementing agency has received funding from The Ministry of Water & Sanitation and Irrigation (MoWSI) for the Detailed Studies and Design of Namanga Dam Water Supply and Sanitation Project. This mission is in line with requirement of Vision 2030 and is aimed at augmenting water supply and sanitation services to meet the current and futuristic water supply and sanitation demands for Namanga Town and neighbouring urban centres.

TAWWDA is the legal Agency mandated with construction of water works within Machakos, Kitui, Makueni and Kajiado counties. Prior to 3rd May 2019, TAWWDA was known as Tanathi Water Service Board (TAWSB). The Agency is mandated to undertake the development, maintenance, and management of National public water works within the area of jurisdiction. It is also mandated to operate the water works and provide water services as a water provider, until such a time as a responsibility for the operation and management of the waterworks are handed over to a County Government. The Agency provide technical services and capacity building to such County Governments and water services providers within its areas as may be requested and provide to the Cabinet Secretary technical support in the discharge of his or her functions under the Constitution of Kenya and the Water Act 2016.

In the present study assignment, TAWWDA has contracted Ms. Runji Consulting Group Ltd to undertake the Detailed Design of Namanga Dam Water Supply and Sanitation Project. The Consultant commenced the studies on 25<sup>th</sup> May 2021. The conclusion of the assignment will be marked by the finalisation of design reports, tender documents, ESIA report and RAP report for the Project. It is in this regard that this Valuation Report has been prepared for purposes of budgeting for the compensation values that will be accorded to the Project Affected Persons whose land will be acquired in order to implement the project.

Prior to the present assignment, the Agency engaged Ms Seven Seas Consultants Limited for the Feasibility Studies and Preliminary Designs, cost estimates and tender documentation of the Project. The studies concluded in June 2020, recommended further investigations on construction of Namanga Dam, water treatment plant, water distribution to serve Namanga Town and Maili Tisa Town Centre.

## 1.2 Project Description

The proposed dam is to supply water to Namanga Town, Maili Tisa Centre, Ngataek Centre, Bisil Town and all the settlements between these towns. Sewerage works coverage is limited to Namanga Town.

The Project study has two main components of water supply and sanitation.

- Water supply study aims at augmentation of the existing system. The key components of the existing system include river intake works, chlorination of the river water, boreholes, ground and elevated storage tanks, limited water pipe network and limited individual connections. The existing water sources (Oldonyo Orok Springs/Stream, boreholes) have a measured capacity of 770m<sup>3</sup>/day and a design capacity of 1,178m<sup>3</sup>/day during wet season. The existing system for the town is challenged by limited pipe distribution
- There is no existing off-site waste water treatment facility for the project area. This study aims at developing plans for new waste water collection and treatment system

### 1.3 Terms of Reference

We received instructions from **Runji Consulting Group Limited, of P.O Box 68053-00200, Nairobi**, to carry out valuation for the assets (land, structures, trees & crops) to be affected by the Proposed Namanga Dam Water Supply and Sanitation Project and prepare a valuation report for **budgeting and compensation purposes**.

We therefore present our valuation as follows: -

- Market Value of the affected land
- In addition to: Disturbance Allowance @ 15% of the above totals.

### 1.4 An Overview of Resettlement Action Plan (Rap)

The Resettlement Action Plan (RAP) Study is an important exercise for any institution that wants to develop facilities where there are human activities. Preparation of a RAP is hinged on a Resettlement Policy Framework (RPF). RPF is a statement of policy, procedures, principles, institutional arrangements that guides and governs how to resolve issues arising from displacement. The RPF provides guidelines on how to avoid, manage or mitigate potential risks arising from the envisaged project. Based on the RPF, a detailed Resettlement Action Plan (RAP) is then prepared for each individual project within the RPF framework.

RAP is guided by the National Legal framework on entitlements for displaced populations as well as international good practices on involuntary resettlements. The preparation of the RAP is guided by the relevant legal policy framework in Kenya (Kenya Constitution 2010, the Land Act 2012) and the international good practices (World Bank OP.4.12, Japan International Cooperation Agency (JAICA) Guidelines, 2010 and the African Development Bank (AfDB) Guidelines on involuntary resettlement.

An important aspect of preparing a RAP is to establish appropriate socio-economic baseline data to identify persons who are likely to be affected by the implementation of the proposed development project. Such an action will require consultation and participation of the would-be affected persons and communities, in decision-making processes related to resettlement. A

RAP should address potential adverse impacts of the project and at the same time make provisions for improving the socio-economic conditions of the populations affected by the project (PAPs).

Therefore, to achieve the objectives of RAP, a mix of professionals is required, key among them being; Land Surveyor, Sociologist and Land Economist (Valuer). Others would be Public Finance Expert and Physical Planner. We note that the expertise of Land Surveyor and Public Finance are missing in your RFP but we recommend their inclusion in the lead team. We have included them in our technical proposal. A Land Surveyor is vital to carry out cadastral survey and determine the acreage of individual parcels of land for each Project Affected Person (PAP), especially where the affected parcels have not been adjudicated/registered, and produce settlement plans. This data is key in estimating the compensations for each PAP. On the other hand, a public finance expert would advise on costs and budgets of the RAP and educate the PAPs on the Income Restoration strategies.

### **1.5 Purpose of the Valuation report**

The objective of this valuation report is to come up with value estimates for land, structures, trees and/or crops which will then provide a strategy for resettlement compensation to ensure that PAPs livelihoods are restored and/or improved

## **2 PROCESS OF COMPULSORY LAND ACQUISITION IN KENYA**

Previously, compulsory land acquisition in Kenya was governed by Land Acquisition Act Cap 295 before it was repealed and replaced with Land Act No.6 of 2012.

Under the Land Act, 2012 Part VII, the process of compulsory land acquisition can be summarized as follows: -

### **2.1 Proof that acquisition is for public good**

Whenever the national or county government is satisfied that it may be necessary to acquire some particular land under section 110 of Land Act 2012, the acquisition of the land must be necessary for public purpose or public interest, such as, in the interests of public defence, public safety, public order, public morality, public health, urban and planning, or the development or utilization of any property in such manner as to promote the public benefit. The act state that respective Cabinet Secretary or the County Executive Committee Member shall submit a request for acquisition of public land to the NLC to acquire the land on its behalf.

### **2.2 Publication of notice of intention to acquire**

Upon approval, the Act provide that NLC shall publish a notice of intention to acquire the land in the Kenya Gazette and County Gazette and serve a copy of the notice to every person interested in the land and deposit the same copy to the respective Lands Registrar. The notice is expected to include the description of the land, indicate the public purpose for which the land is being acquired and state the name of the acquiring public body. According to the act, any interested person shall include any person whose interests appear in the land registry and the spouse or spouses of such person as well as any person actually occupying the land and the spouse or spouses of such person. The Lands Registrar shall then make entry in the master register on the intention to acquire and the land shall be geo-referenced and authenticated by the survey office at both national and county level.

### **2.3 Inspection of the Land to be acquired**

NLC may authorize in writing any person to enter the land specified in the notice to ascertain or satisfy whether the intended land is suitable for the public purpose which the applying authority intends to use as specified. However, the authorization shall not empower the person to enter a building, an enclosed court or garden attached to a dwelling house without the permission from the occupier or having served a written notice to the occupier on intention to enter in not less than seven days before entry. As soon as possible, NLC shall promptly pay in full, just compensation for any damages resulting from entry.



## **2.4 Notice of inquiry**

Thirty days after the publication of the Notice of Intention to Acquire, the NLC then schedules a hearing for public inquiry. NLC must publish notice of this hearing in the Kenya Gazette and County gazette 15 days before the inquiry meeting and serve the notice on every person interested in the land to be acquired. Such notice must instruct those interested in the land to deliver to the NLC, no later than the date of the inquiry, a written claim for compensation.

## **2.5 Public Hearing/Inquiry**

At least 30 days after publication of the Notice of Intention to Acquire the Commission shall appoint a date for an inquiry to hear issues of propriety and claims for compensation by persons interested in the land. At the hearing the NLC must conduct a full inquiry to determine the number of individuals who have legitimate claims on the land and receive written claim of compensation from those with interest in the land. For the purposes of this inquiry, the Commission shall have all the powers of the Court to summon and examine witnesses, including the persons interested in the land, to administer oaths and affirmations and to compel the production and delivery to the NLC of documents of title to the land. The public body for whose purposes the land is being acquired, and every person interested in the land, is entitled to be heard, to produce evidence and to call and to question witnesses at an inquiry. It will also provide opportunity to those interested in the land to hear the justification of the public authority in laying claims to acquire the land

## **2.6 Award of Compensation**

Upon conclusion of the inquiry NLC prepares a written award to each legitimate claimant. The NLC will publish these awards which will be considered “final and conclusive evidence” of the area of the land to be acquired, the value of the land and the amount payable as compensation.

## **2.7 Payment of Compensation**

A notice of award and offer of compensation shall be served to each person by the Commission. Section 120 provides that “first offer compensation shall be paid promptly” to all persons interested in land before a notice of acquisition is issued. Section 119 provides a supplementary condition and states that if the size of land is greater than the size of land in respect of which the award has been made, then NLC shall compensate for excess size “as soon as practicable”. Where such amount is not paid on or before the taking of the land, the NLC must pay interest on the awarded amount at the market rate yearly, calculated from the date the State takes possession until the date of the payment.

In cases of dispute, the Commission may at any time pay the amount of the compensation into a special compensation account held by the Commission, notifying

any persons interested accordingly. If the amount of any compensation awarded is not paid, the Commission shall on or before the taking of possession of the land, open a special account into which the Commission shall pay interest on the amount awarded at the rate prevailing bank rates from the time of taking possession until the time of payment.

## **2.8 Transfer of Possession and Ownership to the State**

Once first offer payment has been awarded, the NLC serves notice to all persons with interest in the property indicating the date the Government will take possession. Upon taking possession of land, the commission shall ensure payment of just compensation in full. When this has been done, NLC removes the ownership of private land from the register of private ownership and the land is vested in the national or county Government as public land free from any encumbrances.

The commission has also the power to obtain temporary occupation of land. However, the commission shall as soon as is practicable, before taking possession, pay full and just compensation to all persons interested in the land.

## **2.9 Urgent Acquisition**

In cases of where there is an urgent necessity for the acquisition of land, and it would be contrary to the public interest for the acquisition to be delayed by following the normal procedures of compulsory acquisition under this Act, the Commission may take possession of uncultivated or pasture or arable land upon the expiration of fifteen days from the date of publication of the notice of intention to acquire, and on the expiration of that time the Commission shall, notwithstanding that no award has been made, take possession of that land in the manner prescribed by subsection (1) of the Act.

Upon taking the land under subsection (1) or (2) the commission serve a notice to the registered owner and the lands registrar that possession of land has been taken and now vests on the County or National Government.

## **2.10 Dispute Resolution**

Any dispute arising from any matter provided under this Act shall be referred to Environment and Land Court. However, Land Value (Amendment) 2019, has reviewed this and provided for Land Acquisition Tribunal as the first jurisdiction to hear any disputing arising from the acquisition with Environment and Land Court exercising appellant jurisdiction.

## **2.11 Valuation Provision**

It should be noted that the Land Act, 2012 does not explicitly provide for a valuation in the process. However, the Land Value (Amendment) Act 2019 which amended the Land Act, valuation is explicitly provided under section 3 which state that if the NLC establishes that the request meets the criteria for compulsory acquisition it shall cause

the affected land to be mapped out and valued by the NLC using the valuation criteria provided in the Act and also establish that the acquiring authority has identified the number and maintains a register of persons in actual occupation of the land, confirming for each such occupation how much time they have been in uninterrupted occupation or ownership of interest in the land prior to the date of the request for acquisition of the land, and the improvements thereon.  
part.

### **3 LAWS RELATING TO COMPULSORY ACQUISITION/INVOLUNTARY RESETTLEMENT IN KENYA**

Kenyan legislations do not use the term involuntary resettlement. Involuntary resettlement refers to two distinct but related processes. The first, displacement, is a process by which development projects cause people to lose land or other assets, or access to resources. This can result in physical dislocation, loss of income or other adverse impacts. The second process, resettlement, or rehabilitation, is a process whereby those adversely affected are assisted in their efforts to improve, or at least restore, their incomes and standards of living.

The legislation related to involuntary resettlement in Kenya include Kenya Constitution (2010), Land Act (2012) and Land Registration Act 2012. These legislations provide for involuntary acquisition or purchase of private land for a public purpose or interest. They also provide for prompt and full compensation for loss of land and other assets to all persons determined to have interest in the land, including occupants in good faith of land acquired who may not hold title to the land.

What the laws do not provide for is resettlement of people displaced as a result of such compulsory acquisition beyond monetary compensation. This is notwithstanding the fact that affected persons may incur much more than they are paid in compensation in order to restore their livelihoods to previous status.

In this context the interpretation of “just compensation in full” may vary from one acquiring entity to another, with others considering the issue of livelihood restoration as an aspect of corporate social responsibility, rather a resettlement need. The Consultants will review the relevant existing legal framework related to RAP, such as the ones highlighted below.

#### **3.1 Kenya Constitution 2010**

The Kenya Constitution (2010) in Article (40) on right to property provides that every person has the right, either individually or in association with others to acquire and own property of any description in any part of Kenya. However, Article 40(3) provides that the State may deprive a person of property of any description if the deprivation is for a public purpose or in the public interest, and that there is “prompt payment in full of just compensation” to the person.

Article 40(4) provides for compensation to be paid to occupants in good faith of land acquired under clause (3) who may not hold title to the land. These provisions of Article (40) have been legislated for in the Land Act of 2012, Land Registration Act of, 2012 and Electricity Power Act of 1997.

### 3.2 Land Act No. 6 of 2012

The Land Act (2012) repealed both the Land Acquisition Act and the Way leaves Act that relate to deprivation of property for a public purpose or in the public interest, and provided for the same under Part VIII on *compulsory acquisition of interest in land* and Part X on *easements and analogous rights*, respectively.

The Land Act vests the procedures for compulsory acquisition of land in the National Land Commission on behalf of an entity requiring land for a public purpose or public interest, and provides under Section 111(1) that if land is acquired compulsorily, "just compensation shall be paid promptly in full to all persons whose interests in the land have been determined".

Section 144(1) of the Act provides for the creation of a way-leave on application to the Commission whether by a State department, county government, public authority or corporate body. The entity applying for way leave shall serve notice to all persons occupying or have interest in the land and the county government in whose area of jurisdiction land over which the proposed way-leave to be created is located.

Sections 146-147 provide for the procedure to be followed by the Commission in the creation of the way leave that involves consultations with the respective county government and the occupants of the land. The agreed way leave should be delineated, published in the Gazette by the Cabinet Secretary for Lands, notified to the county government, and publicized in any manner to bring it to attention of people occupying or using the land along the route of the way leave.

Section 148(1) provides for compensation for a way leave in case of private land to any person in lawful or actual occupation as assessed by a qualified valuer in respect of:

- (i). The use of the land
- (ii). The damage suffered in respect of trees, crops, buildings on the route of the way leave
- (iii). The damage suffered during any preliminary work undertaken in connection with surveying or determining the route of that way leave.

Section 148(5) provides for recourse to Land and Environment Court for a person entitled to compensation for way leave who is dissatisfied with the amount, mode of payment and time taken to make payment. The Court in determining the amount and method of payment may make additional costs and inconvenience incurred by the person entitled to compensation.



### **3.3 Land Registration Act of 2012**

The Land Registration Act (2012) provides for registration of overriding interests in the register for each parcel of land. The overriding interests under Section 28 include among other things rights of way, rights of water, or electric power lines, telephone and telegraph lines or poles, pipelines etc erected, constructed or laid in pursuance or by virtue any power conferred by any written law. It is a requirement that any way leave or ROW acquired be gazetted and submitted to the Land Registrar for entry into the particulars of each parcel of land affected.

### **3.4 Community Land Act, 2016**

Compulsory acquisition of community land is provided for under Part V of the Act. The Act states that subject to the Constitution and the Land Act, no right over community land may be compulsorily acquired by the State except in accordance with the law, for a public purpose and upon prompt payment of just compensation to the person or persons, in full or by negotiated settlement.

### **3.5 The Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act, 2012.**

The provisions of this Act are guided by the Bill of Rights under the Constitution of Kenya 2010. Section 5 of the Act lists development projects among the displacing factors and outlines involvement of the affected persons through awareness, sensitization, training and education on causes, impact, consequences and prevention measures.

Section 6 of the Act provides that displacements and relocation from land required for a development project will only be justified by a compelling and overriding public interest.

Section 22 list procedures to be followed during relocation which include justification as to why the displacement is unavoidable and that there is no other feasible alternative, seeking free and informed consent from the affected persons, holding public hearing on project planning, giving reasonable notice to allow the affected persons review and react to the displacement conditions and that displacement process should reflect respect to human rights.

### **3.6 The Matrimonial Property Act, 2013**

The Act identifies the joint ownership of matrimonial property. Section 4 gives instances when a woman has the same right as a man with regard to property. Despite any other law, a married woman has the same rights as a married man. It provides for the equal status of spouses to acquire, administer, hold, control, use and dispose of property whether movable or immovable, to enter into a contract and to sue and be sued in her own name. This law is relevant because of the shared property rights in polygamous or monogamous families that will be encountered during acquisition.

### 3.7 The Land Value (Amendment) Act 2019

The Act came into force on 16 August 2019 and has amended various sections of the Land Act, the Land Registration Act as well as the Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act. Major provision introduced by the Act can be summarized as follows: -

- **Government to take possession of land before compensation;** Before enactment of this Act, the National Land Commission (NLC) was required to compensate a landowner prior to taking possession of the land. However, the Act now allows the NLC to take possession of the land and pay compensation at a later date within a reasonable amount of time (not later than one year). The Act contravenes the constitution which provide for prompt and just compensation as one year maybe considered too long to be considered prompt.
- **Establishment of the Land Acquisition Tribunal and limiting powers of the court;** The Act has established the Land Acquisition Tribunal which shall hear disputes related to the compulsory land acquisition process and in determining such disputes, confirm, vary or quash the decision of the NLC. Before the enactment of this Act, disputes were referred to Environmental Land Court as the first jurisdiction to hear such a dispute. However, under this Act, the Tribunal is the first jurisdiction to hear such disputes with Environmental Land Court exercising appellate jurisdiction.
- **NLC possession of land;** The Act provides that where the NLC has taken possession of the land, no order stopping any development of the land may be issued by any court if public funds have already been committed to its development.
- **Assessment of Land Values;** The Act provides that valuation of freehold land and community land for purposes of compensation shall be based on the Land Value Index. This is an analytical representation showing the spatial distribution of land values in a given geographical area at a specific time to be developed jointly by the national government and county government. In calculating the Land Value Index, the declared value of the land for purposes of payment of rates, rents or stamp duty shall be taken into account in addition to other factors provided in the Act such as the increase in the value of the land due to improvements made on it. However, an increase in value will be disregarded if the improvements are carried out after the publication of a gazette notice that sets out the government's intention to acquire the land compulsorily.
- **More forms of compensation;** Apart from monetary compensation, the following new forms of compensation have been introduced under the Act:
  - Allocation of an alternative parcel of land of equivalent value and comparable geographical location and land use to the land compulsorily acquired;
  - Issuance of government bond;
  - Grant or transfer of development rights as may be prescribed;

- Equity shares in a government-owned entity; and
- Any other lawful compensation.

## 4 VALUATION METHODOLOGY AND STRATEGY ADOPTED

### 4.1 Comparative Sales Method (Market Comparables Approach Method)

This is the most realistic of all valuation methods. It is based on the comparison of the property to be valued with similar properties and the prices achieved from them, taking account of the differences between them. The comparability of the properties is based on the use of the property, location (characteristics of the neighbourhood), site area, site conditions, physical properties of the building (floor area, building materials used, amenities such as garage, etc.), and income related factors. The data to come up with an estimate market value is normally obtained from local land agents, valuers, government departments, and other sources as necessary. Comparability is usually in respect of property transaction prices and market conditions. Each of these aspects has to be thoroughly analysed before accepting the method. The intention is to compare similar properties. For instance, agricultural land in one county may not be the same in another county, nor can residential property be compared with an industrial property.

This method of valuation is particularly constrained because of the general lack of market transactions. In some instances, property transactions are fairly secretive due to the controlled nature of the property market. Additionally, sales data often become historic due to effects of hyper-inflation making comparable sales analysis difficult.

The land estimate value in our case is based on Market Rate (commercial rate) according to Kenya law for sale of land or property. In terms of land, this may be categorized as follows;

- a. Replacement cost for agricultural land: means the pre- program or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land,
- b. Plus, the costs of preparing the land to levels similar to those of the affected land; and
- c. Any registration and transfer taxes;

### 4.2 Valuation Strategy

The valuation report provides a strategy for resettlement compensation to ensure that the PAPs' livelihoods are restored and/or improved before the land for the planned construction of the *Namanga Water and Sanitation project* is finally acquired. The strategies employed during the valuation of the access road are discussed below.

#### 4.2.1 Valuation of Land

We first established the size of land to be affected and then we used the comparables sales data for recently sold land in the vicinity of the affected land. Comparable sales data was obtained from land sales agent in Namanga, fellow Valuers, chiefs and headmen in areas

affected by the project, Kajiado Lands Registry, among other land dealers. This sales data was then adjusted and used to compute the compensatable amount for the affected land.

#### **4.2.2 Valuation of Houses and Other Structures**

In the valuation of houses and other structures, the following aspects were taken into consideration:

- The market cost of the materials to build a replacement structure with the area and quality similar to or better than those of the affected structure, or to repair a partially affected structure,
- Plus, the cost of transporting building materials to the construction site,
- Plus, the cost of any labour and contractors' fees, plus the cost of any registration and transfer taxes

**NB:** The proposed project does not affect structures hence no value has been assigned to them.

#### **4.2.3 Valuation of Trees and/or Crops**

For valuation of trees and/or crops, we relied on comparable data from various actors involved in compensation where similar projects have been conducted including Kenya Agricultural Research Institute (KARI) now Kenya Livestock and Research Foundation (KALRO), Department of Agriculture in the Ministry of Agriculture, Livestock and Fisheries, Rural Electrification & Renewable Energy Corporation (RE & REC), National Irrigation Authority (NIA), etc. Further, Under Kenya Resettlement Policy Framework 2017, trees and crops are supposed to be compensated using the guidelines from the Ministry of Agriculture and Kenya Forest Service.

**NB:** We did not assess the value of trees for the Kenya Forest Service land since we did not get access to the land. (See appendix 6.4) on letter done to KFS). Further, most of the trees and/or crops along the project corridor are seasonal hence farmers/PAPs can be given adequate time to harvest.

### **4.3 GENERAL REMARKS**

During our valuation fieldwork exercise, we noted some areas of concern which we have captured as comments as follows: -

#### **4.3.1 Sewer Component**

The Registration Section of the parcels to be acquired along the first section of the land near Namanga Town where the pipe is expected to pass reads Kajiado/Meto. This might be explained by the alleged overlapping of the cadastral maps from the County Department of Lands office and needs to be sorted out in the next phase of the project implementation. To this end, we encountered a great challenge around this section since they were not willing to



give their details as the registration details we had differed with what they held as title deeds. Accordingly, we have not apportioned value estimates to individual PAPs and have thus based our compensation value estimates on the total acreage proposed to be acquired along the sewer-line project corridor.

#### **4.3.1.1 Trunk Line**

There is no need of acquisition at the boarder point area because there is an adequate road reserve where the line can pass through until where it exits the main road and joins the earth-road. The earth road also has adequate space for sewer line passage. Upon exiting the earth-road, acquisition now becomes inevitable.

Right before accessing the Waste Water Treatment Plant (WWTP), there is no need of acquiring wayleave within parcels 2077,2078 and 3706. The line can pass through the existing wayleave BUT probably within 3707 (to facilitate a smooth turning which is not a must unless it's a design parameter)

#### **4.3.1.2 Line 1**

The line passes next to the existing Namanga road and it can be fixed along the edge of the road reserve.

#### **4.3.1.3 Line 2**

There is adequate reserve to accommodate the line thus no need for acquisition.

#### **4.3.1.4 Line 3**

To minimize the acquisition, the line can be re-routed to pass through an existing road reserve to the point of the Dead-end then a minimum acquisition can be effected to allow connection to the MTL.

#### **4.3.1.5 Waste Water Treatment Plant (WWTP)**

We visited the PAP (Parcel No.1001) where the WTP will be situated and the land owners was not willing to sell 100 acres, which is his entire piece of land. He indicated that he could only part with about 50acres. Our suggestion is that there is a need for the project proponent to have a meeting with him and the neighbouring land owners to see if they are willing to sell their land parcels for construction of the WWTP.

### **4.3.2 Water Supply Component**

There is an existing 12M road corridor that connects the KFS land and Maili Tisa and therefore the project can be restricted to this road corridor to avoid acquisition.

### **4.3.3 Dam, Water Treatment Plant and Access Roads Component**

The project has designed these components within the Ol Doinyo Orok Forest land. This will minimize the displacement of persons as the forest lies within government land. The Consultant did not manage to undertake an inventory of the affected trees within the forest, but the affected land size has been considered in the valuation. Therefore, we recommend that during the acquisition, KFS to be engaged as they have their system of taking an inventory of the trees and their value assessed if need be. If KFS, which by extension is a government agency, requires compensation for their trees to be affected, the same can be considered under the contingency sum provided for in the RAP Report.

#### **4.3.4 Structures, Trees and/or Crops**

Most of the proposed sewer line corridor affects land parcels that are devoid of any structures. Where there are crops and/or trees to be affected, PAPs can be given ample time to harvest since most of them are seasonal.

## 5 VALUATION OF AFFECTED ASSETS

### 5.1 Asset Inventory

A field survey undertaken between 3<sup>rd</sup> April 2023 -10<sup>th</sup> April 2023 that sought to take an inventory of the affected assets within the project area as per the design, it was found that the major impact is loss of land at the proposed dam area and the sewerage system area.

Table 5-1 shows the affected land size and estimated cost for each component. A detailed list on the asset inventory schedule is provided in appendix 6.2.

Table 5-1: Estimates of Affected Land Parcel for the various project components

	Affected Land Parcel in Acres	Affected Land Parcel in Ha	Total Compensation Cost (Inclusive of Disturbance Allowance (KES)
Dam area	64.2451	25.9996	73,881,888
Tank 1,3,4	0.997	0.4035	1,819,341
Pump station 1 & 2	3.5533	1.4380	8,494,996
WWTP	104.3822	42.2429	240,079,160
Access Road	3.053	1.2355	5,266,467
Trunk Line	9.9235	4.0160	36,069,902
	<b>186.1541</b>	<b>75.3355</b>	<b>365,611,755</b>

### 5.2 Certificate of Value

Having regard to the foregoing particulars, our terms of reference and the present day economic circumstances, it is our considered opinion that the value of the assets proposed to be affected as at the date of inspection by the *Namanga Water and Sanitation Project Corridor, Kajiado County for Compensation Purposes* is as follows:

-

Table 5-2: Summary of total valuation costs

	ASSETS CATEGORY	MARKET VALUE (KSHS)	ADD 15% DISTURBANCE ALLOWANCE (KSHS)	TOTAL VALUE (KSHS)
1	Land (186.15 Acres)	317,923,265.00	47,688,490.00	365,611,755.00
2	10% Contingency Sum			36,561,175.52
	<b>GRAND TOTAL</b>			<b>402,172,931.00</b>



**CERTIFICATION:**

This Valuation Report has been prepared for **RUNJI CONSULTING GROUP LTD, 3<sup>RD</sup> KINDARUMA ROAD (OFF NGONG ROAD), OF P.O BOX 00200, NAIROBI**, and on behalf of **PROLAND REALTORS LIMITED of P.O BOX 29509 – 01000 NAIROBI, BY: -**



.....  
**NICHOLAS KIMANTHI**  
**B.A LAND ECONOMICS (HONS), LLB (UON),**  
**DIPLOMA (I.S.K.) M. I.S.K**  
**REGISTERED & LICENSED VALUER**

**SIGNED AND SEALED ON THIS 17<sup>TH</sup> DAY OF MAY, 2023.**

## 6 Appendix

### 6.1 Valuer's Practicing License 2023

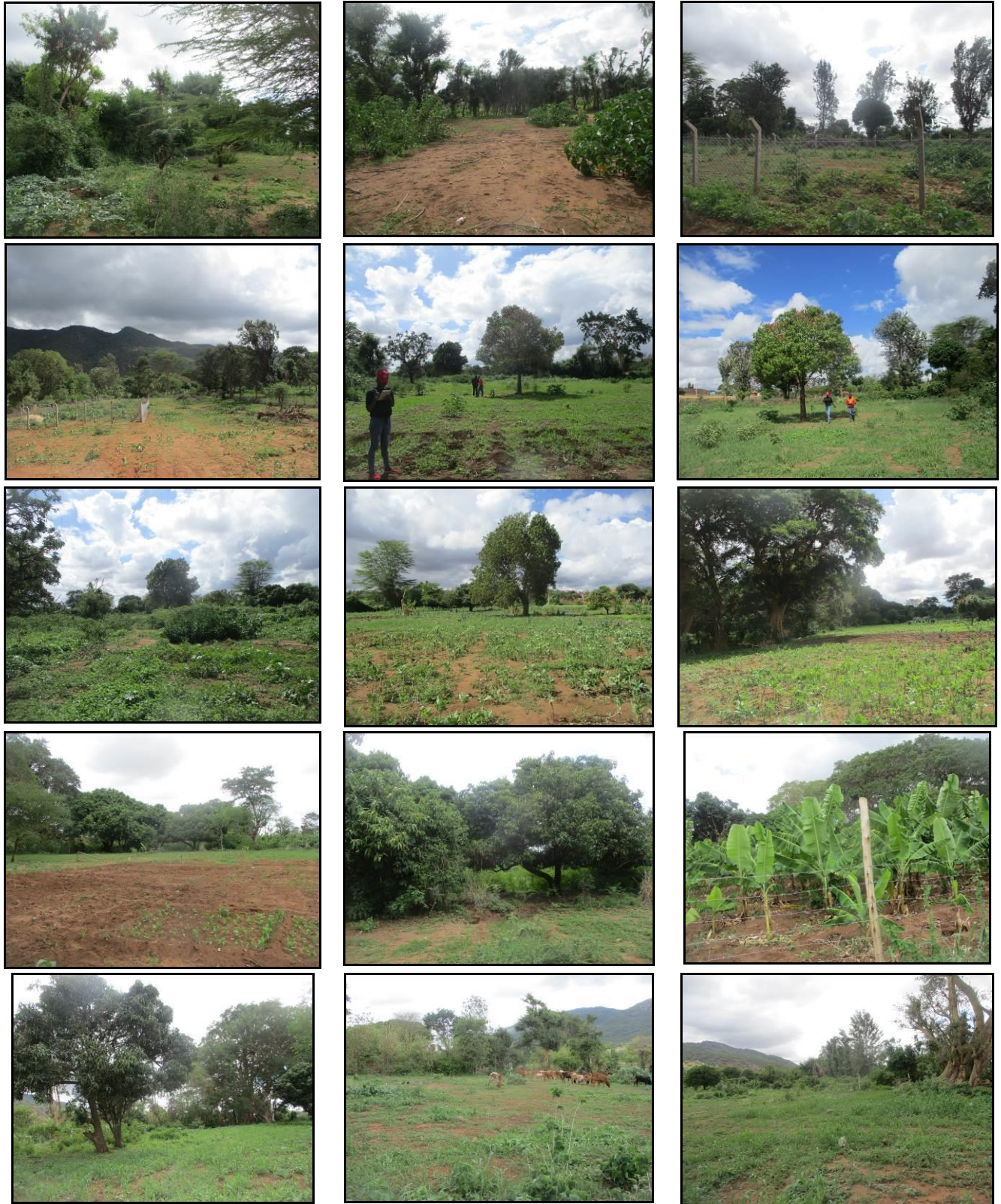




## **6.2 Asset inventory schedule**



### 6.3 Sampled photos of the affected land parcels















*Plate 6-1: Sample photos of the affected land parcels to be acquired*  
*Source: Photos taken during the field survey undertaken between 3<sup>rd</sup> April 2023-10<sup>th</sup> April 2023.*





## **6.4 Layouts**

### **6.4.1 General dam layout plans**



### **6.4.2 Namanga Water Transmission Lines Layout**

### **6.4.3 Namanga Town Water Distribution Layout**

### **6.4.4 Sewerage General Layout Plans**

## 6.5 Letter submitted to the Chief Conservator at KFS

**Runji Consulting Group**  
Engineering & Project Management



3, Kindaruma Road, (Off Ngong Road)  
P.O. Box 68053-00200, **Nairobi**, Kenya  
Telephone: (020) 2717213/4, 2713066  
Cell: +254 722 751889/+254 735 677627  
Email: [info@runji.co.ke](mailto:info@runji.co.ke)  
Web: [www.runji.co.ke](http://www.runji.co.ke)

Our ref: WR 970/PROJ./2022 12-13 (1), 13<sup>th</sup> December 2022

**The Chief Conservator of Forests,**  
Nairobi Conservancy,  
Kajiado Ecosystem,  
Kenya Forest Service.

Dear Sir,

**CONSULTANCY SERVICES FOR DETAILED STUDIES OF NAMANGA DAM  
WATER SUPPLY AND SANITATION PROJECT-TAWWDA/028/2020-2021**

**Asset Inventory for Valuation**

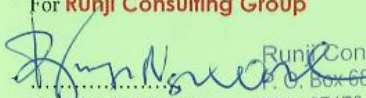
Reference is made to the above-mentioned Project study which is being undertaken by Runji Consulting Group as the consultant for Tanathi Water Works Development Agency. Reference is also made your later ref. WATER/1/KFS/VOL.XII/20 and dated 28 January 2019 granting access to Ol doinyo Orok Forest for studies related to siting of Proposed Namanga Dam Project.

As part of evaluating the feasibility of the proposed site for dam construction, the consultant is expected to prepare an Environmental and Social Impact Assessment Report and undertake valuation of all assets that will be directly affected by the Project for purposes of budgeting before the actual acquisition process.

The purpose of this letter is to kindly request your assistance in taking inventory of the trees that will be affected by the target project area within the Ol doinyo Orok Forest. The entire affected area is approximately 22.6 hectare (56acres). See attached Project layout plan.

Your assistance will be highly appreciated.

Yours sincerely,  
For **Runji Consulting Group**



Runji Consulting Group Ltd.  
P. O. Box 68053 - 00200, Nairobi  
TEL: 2717213 / 4

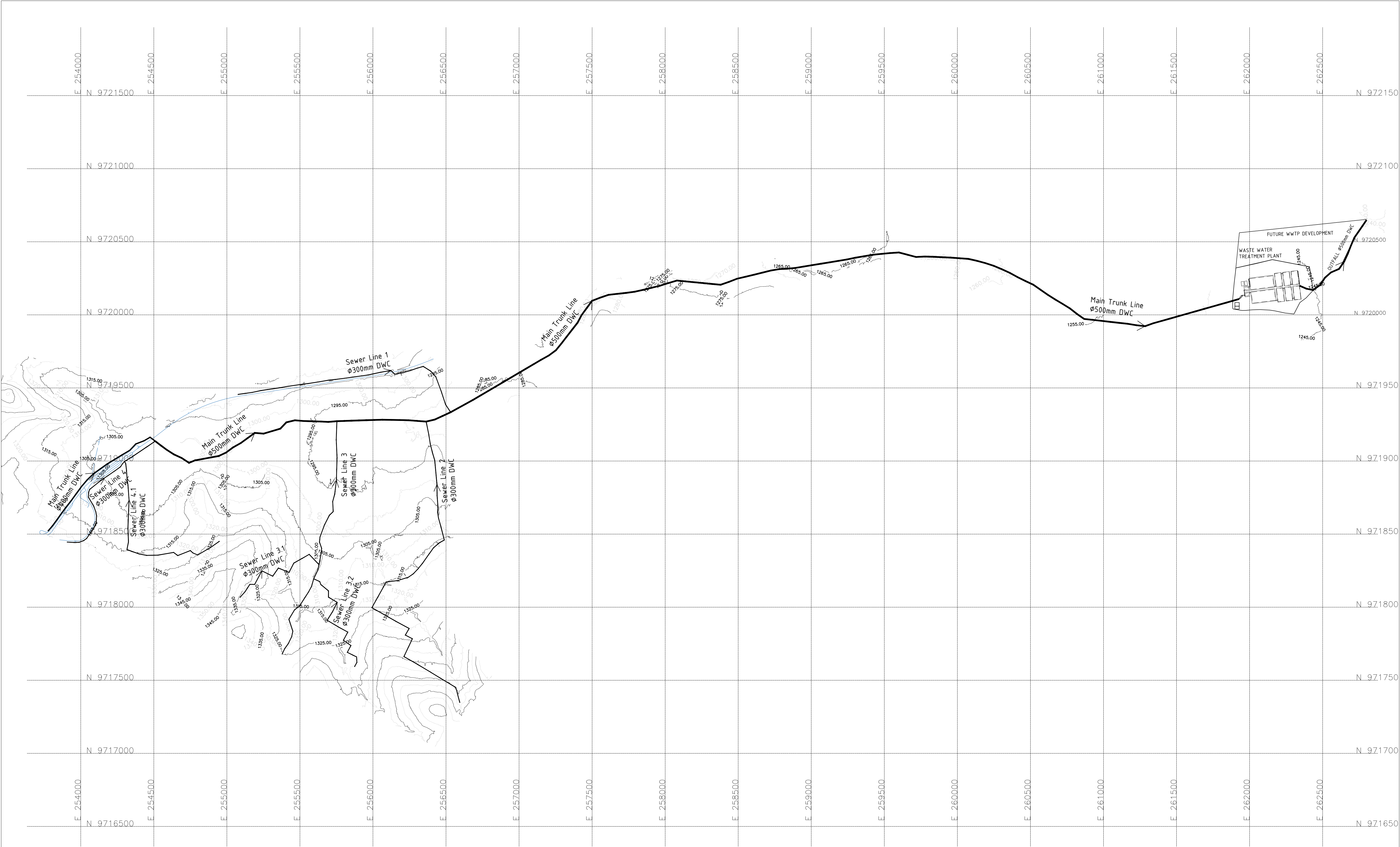
Eng. Runji Ngware  
**Managing Director**

Encl./  
JOM/-

Directors: Runji Ngware B.Sc(Eng.), M.Sc(Eng.), MIEK, MACEK, R.Eng.(Managing); J.Mburu B.Sc(Eng.), MIEK, R.Eng.  
M. Nyaga John B.Sc(Eng.), MIEK, R.Eng, L. K. Wesamba B.Sc(Eng.), M.Sc(Eng.), MIEK, R.Eng

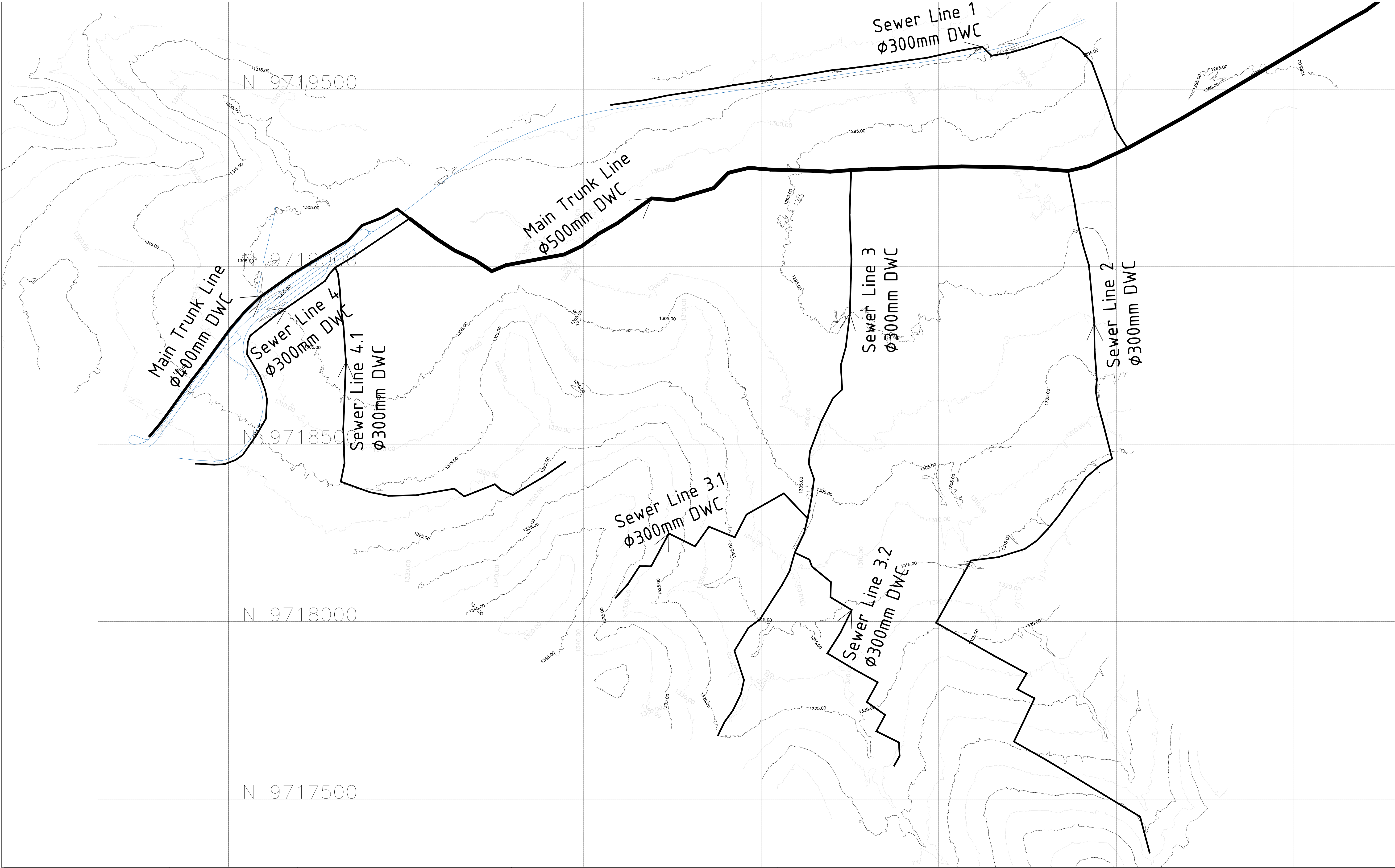
Member of FIDIC through the Association of Consulting Engineers of Kenya (ACEK)





Reference Drawings	<div>DESIGN CONSULTANT</div> <div><div><div></div><div></div><div></div><div></div></div><div>Runji Consulting Group Ltd</div><div>Engineering &amp; Project Management.</div><div>P. O. Box 68053-00200 Nairobi</div></div>			Designed by: SMW	Drawn by: MM	<div>CLIENT:</div> <div><div><div><div></div><div></div><div></div></div><div>TANATHI WATER WORKS DEVELOPMENT AGENCY</div></div></div>			Project: CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECTS			
Sign.....				Sign.....	Drawing Title SEWER TRANSMISSION PIPELINES- GENERAL LAYOUT							
				Checked by: PWM	Approved by: R.N	Date :	Date:	Date :	Scale.	Drg No. WR970-NAM/SAN_GL 01(A)		
				Sign.....	Sign.....	PROJECT MANAGER	APRIL. 2023	ENGINEER.				
REVISIONS				Checked	Date	Appr.	WD					



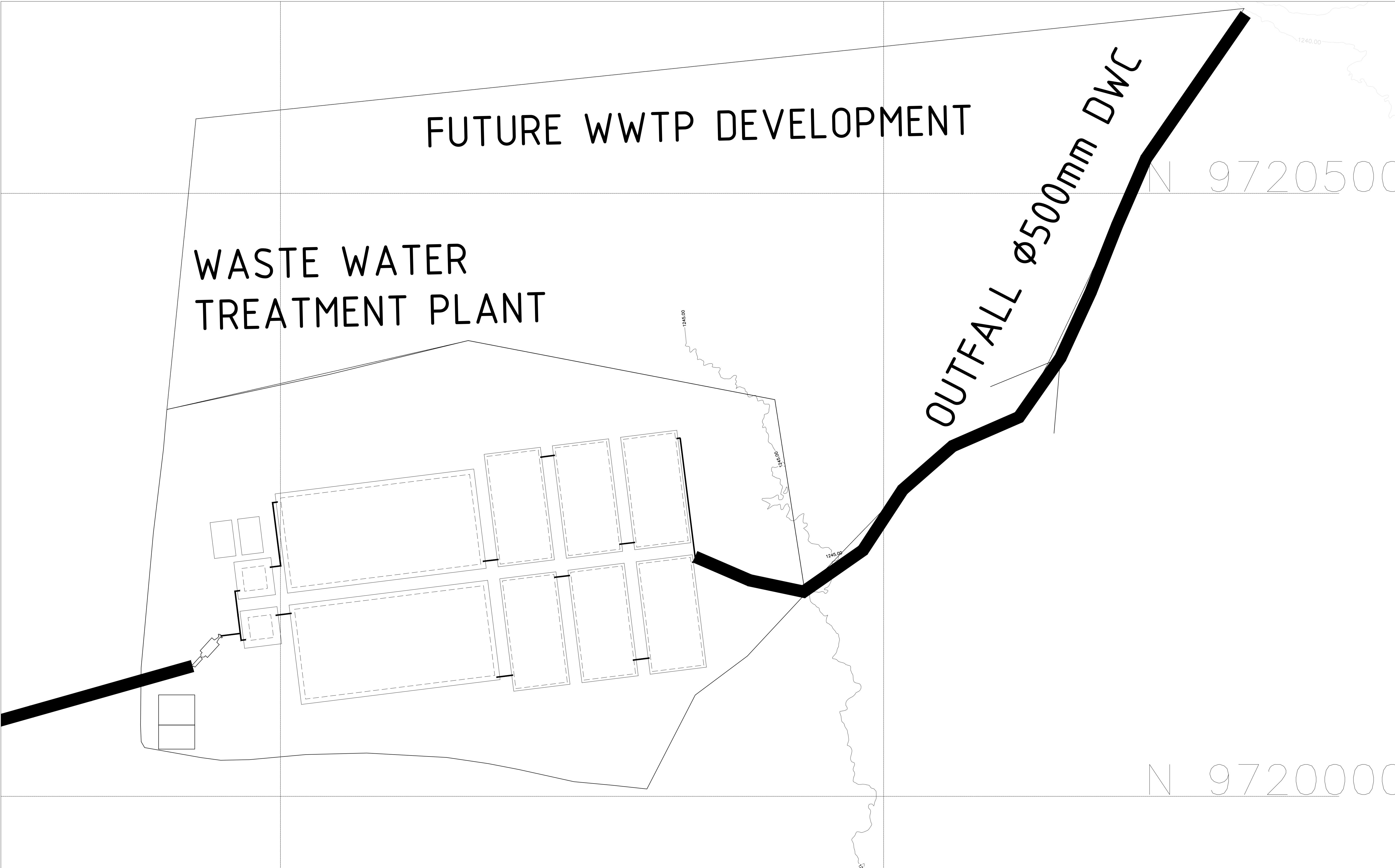


Reference Drawings		<div>DESIGN CONSULTANT</div> <div><div><div></div><div></div><div></div><div></div></div><div>Runji Consulting Group Ltd</div><div>Engineering &amp; Project Management.</div><div>P. O. Box 68053-00200 Nairobi</div></div>	Designed by: SMW		Drawn by: MM		CLIENT:		Project:	
			Sign.....		Sign.....		<div><div><div></div><div></div><div></div><div></div></div><div>TANATHI</div><div>WATER WORKS DEVELOPMENT AGENCY</div></div>		CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECTS	
			Checked by: PWM		Approved by: R.N		Date :		Drawing Title	
			Sign.....		Sign.....		APRIL. 2023		SEWER TRANSMISSION PIPELINES- GENERAL LAYOUT	
							PROJECT MANAGER		Scale.	
							ENGINEER.		1:12500	
R E V I S I O N S		Checked Date Appr. WD							Drg No. WR970-NAM/SAN_GL 01(B)	

FUTURE WWTP DEVELOPMENT

WASTE WATER  
TREATMENT PLANT

OUTFALL Ø500mm DWC



Reference Drawings				<div>DESIGN CONSULTANT</div> <div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>Runji Consulting Group Ltd</div><div>Engineering &amp; Project Management.</div><div>P. O. Box 68053-00200 Nairobi</div></div>	Designed by: SMW		Drawn by: MM		CLIENT: <div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>TANATHI WATER WORKS DEVELOPMENT AGENCY</div></div>			Project: <div>CONSULTANCY SERVICES FOR DETAILED DESIGN OF NAMANGA DAM WATER SUPPLY AND SANITATION PROJECTS</div>		
					Sign.....		Sign.....							
					Checked by: PWM		Approved by: R.N							
					Sign.....		Sign.....							
R E V I S I O N S		Checked	Date	Appr.	WD			Date : <div>PROJECT MANAGER</div>		Date: <div>APRIL. 2023</div>	Date : <div>ENGINEER.</div>	Scale. <div>1:12500</div>	Drg No. WR970-NAM/SAN_GL 01(C)	