ESIA STUDY REPORT

7th June 2022

Design and Presentation of Tender Documents of Kabiruini and Chaka Sewerage Project

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CERTIFICATION

Certification by the EIA/EA Lead Expert(s)

I hereby certify that this Environmental and Social Impact Assessment (ESIA) project report was done under my supervision and that the assessment criteria, methodology and content reporting conforms to the requirements of Environmental Management and Coordination Act, 1999, amendment 2015 and Provisions of the Environmental Management and Coordination (Environmental Impact Assessment and Audit) Regulations 2003, amended 2019 which dictate the submission of such an assessment to National Environment Management Authority (NEMA).

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Signature: _____ Date 23/06/22.

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CERTIFICATION BY PROPONENT(S)

I hereby confirm that the contents of this SEIA project report are true and shall implement the mitigation measures proposed and undertake to implement further instructions as NEMA may deem appropriate in relation to the findings and from time to time as inspections may inform.

Name:

Signature: _____ Date 29/06/2022

Designation:

Tana Water Works Development Agency (TWWDA)

The Chief Executive Officer

Water Works Development Agency

P.O. Box 1292-10100,

Nyeri, Kenya.

26th September 2021

CONTENTS

LIST OF FIGURES

ACRONYMS

DOSH	Directorate of Occupation Health and Safety
EA	Environmental Audit
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EMP	Environmental Management Plan
ESMF	Environmental and Social Management Framework
GOK	Government of Kenya
NEMA	National Environmental Management Authority
NGO	Non-Government Organization
NEAP	National Environment Action Plan
NYEWASCO	Nyeri Water & Sewerage Company Limited
OSHA	Occupational Safety and Health Act
RAP	Resettlement Action Plan
PAPs	Project Affected Persons
PPE	Personal Protective Equipment
SPA	Service Provision Area
WASREB	Water Services Regulatory Board
WRA	Water Resource Authority
WRUA	Water Resource Users Association
WSP	Water Service Provider
WSTF	Water Services Trust Fund
VIP	Ventilated Improved Pit Latrines

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

INTRODUCTION

Tana Water Works Development Agency (TWWDA) was established under section 65(1) of the Water Act, 2016 vide Legal Notice No. 27 of 26th April 2019. The Agency is one of the nine (9) Water Works Development Agencies established under the Ministry of Water, Sanitation and Irrigation.

The Agency's mandate is: ***to undertake the development, maintenance and management of the National Public Water Works within its area of jurisdiction***.

The expansion of Sewerage Project involves expansion and rehabilitation of Sewerage treatment plant located in Dedan Kimathi University of Technology (DeKUT) main Campus in Nyeri that serves the University and its environs. The 8700 student population plus the DeKUT staff are housed outside the University in neighboring estates that belong to the local community. Only 200 students are housed inside the University premises. There is close correlations between the University and the community due to the mutual benefits accrued for each of the party.

Sanitation challenges have been a major challenge since the University was established under the University's Act 2012 by the Government of Kenya in December 2012 and has since witnessed tremendous growth in students and staff population as well as dire need for more housing leading to strained sanitation services. The capacity of the treatment plant is lower than the anticipated sewage load based on the NYEWASCO water consumption and the return factor which estimates the expected waste water from specific consumption. The expansion of DeKUT WWTP plus three (3) other proposed Decentralized Treatment Facilities (for Chaka, Nyaribo and Embassy) is expected to run for 20-40 years before decommissioning calling for ambitious expansion of both the treatment facilities, trunk sewer and lateral sewers coverage in the new project area.

The current wastewater system and wastewater treatment plant for DeKUT was constructed in 2008. The system comprises of sewer lines serving Catholic Hostels which offer accommodation to DeKUT students, the neighboring estate, the show ground area and the University administration and lecture area. The system consists of waste stabilization ponds (WSP) with a design capacity of approximately 350m3/day and a trunk sewer approximately 2.5 kilometers of 225mm uPVC pipes. Currently the waste water treatment plant receives an inflow of about 500m3/day. This caters for about 50% of the University population and about 5% neighboring estates that accommodate the university students. The treatment plant is managed by the University staff and its expansion to serve a wider area will also call for management of specialized staff from NYEWASCO which is a limited company owned by County Government of Nyeri.

The Nyeri Water & Sanitation Company Limited (NYEWASCO) licensed Water Service Provider for Nyeri Sub-County and its environs. Its main mandate is to provide high quality water and sewerage services to the people of Nyeri sub county and its environs. NYEWASCO is responsible for the treatment and disposal of the sewerage within this

service area. DeKuT falls within the SPA of NYEWASCO. However the sewerage system under NYEWASCO has not extended to high concentration area like DeKuT area and other areas proposed in this project.

The wastewater to be treated in this project is mainly domestic wastewater that has been used by water users. It contains all the waste materials added to the clean fresh water during its use. It is thus composed of *human body wastes* (feces and urine) together with the water used for flushing toilets, and *sullage*, which is the wastewater resulting from personal washing, laundry, food preparation and the cleaning of kitchen utensils.

Objective of ESIA study

The general objective of the ESIA study is to carry out a systematic examination of the present environmental situation within the project area to determine whether the proposed project will impact adversely on the physical and biological environmental elements within the project area. This is in line with Section 58 (1 and 2) of EMCA 1999 amended 2015, that requires proponents to carry out ESIA study reports on projects as per the second schedule of the Act.

The objectives of the assessment were:

i. To provide a description of the proposed project cycle activities and the required legislative compliances

ii. To predict and/or determine the potential impacts of the development in terms of the economic, social and environmental considerations for all the five related facilities

iii. To propose appropriate mitigation measures to minimize or eliminate the environmental impacts associated with the development of all the five related facilities

iv. To undertake a public consultative process aimed at obtaining the views of project stakeholders so as to mainstream their concerns and impact mitigation proposals into the Environmental and Social Management Plan (ESMP)

v. To analyze the project alternatives

vi. To promote the adoption of better sanitation services among the public through public awareness

Purpose

The main aim of this study was to carry out an Environmental and Social Impact Assessment for the proposed sewer expansion project. This report presents the findings on the anticipated environmental and social impacts and makes recommendations on the relevant mitigation measures aimed to prevent and reduce adverse impacts. An Environmental and Social Management Plan (ESMP) has been formulated in this report to ensure that the proposed mitigation measures in this

Environmental and Social Impact Assessment (ESIA) project report will be implemented effectively.

Approach and Methodology

The study adopted a participatory and collaborative approach to ensure active participation of all the key stakeholders. As such, discussions were held with community members within the project area and relevant key stakeholders with the assistance and coordination of the proponent and the local administration. The study was carried out using the methodology described in EMCA 1999, amended 2015, and Environmental Impact Assessment and Audit Regulations 2003, amended 2019. The various data collection techniques adopted in the course of the study included literature review, site assessments, public consultations in form of community barazas and key stakeholder consultations comprising of relevant government agencies and lastly public disclosure of the study report will be the last form of public consultation and participation. The approach to this ESIA comprised six phases: Screening, Scoping, Studies, Impact Assessment, Disclosure, and Implementation. Screening was done to determine the significance of the project's environmental impacts which was to ultimately inform whether a full ESIA study is required. This exercise involved project and site description, Collection of baseline data, Data analysis, Evaluation of significance of environmental impacts, Evaluation of project alternatives, consultation and public participation. This exercise resulted in preparation of ESIA Study Report which was submitted to the National Environment Management Authority (NEMA) for review and determination.

In the Scoping Phase, key issues to be investigated and assessed during the subsequent phases of the process are identified, and the range and extent of the studies to be conducted was determined. The primary Project stakeholders were also identified and consulted during the Scoping Phase. In the Study Phase, desktop and field studies were conducted to evaluate the key issues identified during the Scoping Phase. The goals of the Study Phase are to provide a detailed description of the affected area and establish the environmental and social baseline that was to be used in the Impact Assessment Phase: The impacts and effects of the proposed Project were determined during impact assessment phase. To identify and assess the magnitude of potential impacts associated with or resulting from Project activities, the ESIA team used professional judgment from specialists, fieldwork, computer models, and desktop analyses to identify potential impacts and their interactions. Disclosure and implementation phases will come after submission of the report to NEMA.

Scope of the study

The scope of the ESIA study included the following:

(i) Collection and analysis of environmental baseline data and evaluation of impacts of the proposed project on local environment;

(ii) Review of policy, legal and administrative framework that have direct relevance to the proposed project, in an attempt to establish the frameworks within which the significance of the various impacts anticipated from the proposed development can be evaluated;

(iii) Description of the proposed project in terms of location and physical characteristics within the larger project area, design of the project, products, by-products and waste;

(iv) Assessment of the potential environmental impacts of the project on the biophysical, socio- economic, religious and cultural aspects of the project neighbors; and

(v) Development of mitigation measures for adverse impacts identified.

Project Description

The current WWTP in DeKUT caters for only 50% of the University waste water inflow and less than 5% of wastewater from neighboring hostels around catholic hostels. As the population increases, the inflow of waste water is expected to increase sharply and more housing investments are also mounting pressure on existing sanitation utilities. The Sewerage expansion project seeks to cover upto Nyaribo market and its environs, Chaka Township and Embassy area. These three locations will either set a Decentralized Treatment Facility (DTFs) for each or a pump station to channel waste water to a main treatment plant. Due to the avoidance of running costs associated with a sewerage pump station, DTFs are the likely options to be adopted although they will require more land to be set aside compared to a pump. Reticulation system will also be a major part of this project with extension of trunk sewers and laterals that will connect to households. The sewers have been aligned as much as practical along existing road reserve to avoid interfering with existing private properties and developments. The sewers have been designed to take advantage of natural gradient and gravity. This aims at optimizing the pipe gradients in order to minimize the earthworks.

Public Consultation

Public participation in this project was achieved through consultation with the client and the neighboring community. This was done through direct interviews, key informant interviews, community consultative meetings and questionnaire administration. The relevant agencies held a plenary meeting addressing the issues raised during public meetings and filled a special institutional questionnaires that dealt more on institutional mandates and related laws and how they can engage harmoniously to achieve success of this project.

Summary of Impacts

The anticipated environmental and social impacts as a result of project implementation have been screened in this report through the analysis of impacts

on soil environment, air environment, physical environment and the society. The key positive impacts that will be realized upon project implementation include the following:

i. The Proponent will generate more revenue from increased connections
ii. Improved state of sanitation and hygiene in the target estates
iii. Reduction in pollution to surface water sources running within the project areas
iv. Increased value of land
v. Improved sanitation will lessen burdens on women and children hence ensuring enhanced family health
vi. Improved aesthetics in the project areas
vii. Income generation from opportunities
viii. Benefits from capacity building

Environmental Impacts and Mitigation

The EIA team noted positive and negative impacts from vegetation clearing, excavations, constructions, installation, operationalization and possible decommissioning of DeKUT Sewerage Expansion Project considering ecological and socio-economic aspects. The overall aim of the project is ensuring an environmentally friendly sanitation practices while minimizing the foreseeable negative impacts anticipated from the project. The health and safety of the staff will be addressed through ensuring workers have Personal Protective Equipment (PPEs) while the collection and treatment of the effluent as per set legal framework and as per NEMA guidelines, proper solid and liquid waste handling will ensure safety of the surrounding environment. Appropriate mitigation measures have been discussed and an elaborate EMP outlined.

Summary of Impacts and mitigation measures

Environmental/Social Impact	**Proposed mitigation measures**
Air emissions	i. Decreasing the number of trips carried out by the vehicles will minimize air pollution. ii. Vehicles to be used during the construction phase are to be kept in good working condition and should not be the source of excessive fumes.

Noise pollution	i. Road traffic movements shall be scheduled to normal working hours (08H00 –17H00). ii. All equipment and vehicles on the site should be equipped with noise suppressing measures and kept in proper working order. iii. Delivery of materials in bulk to avoid repetitive movements of delivery vehicles will be encouraged iv. Silencers on equipment such as generators will be properly designed. v. Temporary noise pollution due to construction works will be controlled by proper maintenance of equipment and vehicles, and tuning off engines and mufflers. vi Noise problems during operation phase shall be reduced to normally acceptable levels by incorporating low-noise equipment in the design and/or locating such mechanical equipment in properly acoustically lined buildings or enclosures.

Dust Pollution	i. Dust and air pollution due to dust when excavated material is stock piled, should be limited by means of wetting (particularly ii. dry season), covering with foil or working in small sections so that the trenches are backfilled with excavated soil within shortest possible period (maximum 2-3 days). iii. Settled areas within project access routes will be identified and maximum speeds of project vehicles will be established within these areas. iv. Speed limit of 15km per hour will be posted and enforced to reduce airborne fugitive dust caused by vehicular traffic. v. Construction materials will be delivered in bulk to avoid repetitive movements of delivery vehicles vi. Construction materials and stockpiled soils will be covered if they are a source of fugitive dust. vii. Transportation of materials will be done in such a manner that they do not fly or fall off the vehicle by covering or wetting friable materials.
Surface and ground water contamination from wastewater and sludge	i. Effluent /wastewater quality will be tested on a regular basis to ensure that its characteristics are within the set standards. Set out in the third schedule of Water Quality Regulations 2006 ii. Proper measures will be taken to avoid accidental surface runoff intrusion from the manholes of the sewerage network, which can overburden the plant and cause discharge of partially treated wastewater from the WWTP into the river.

Conclusion

On the basis of the evaluation of the development proposal, the EIA team concludes that:

i. The project is a necessity to the residents of Nyeri Sub County as the area is faced by sanitation challenges posing human health challenges and prevalence of waterborne diseases. The black cotton soils are easily water logged and mixing of waste water and surface water is a common sight whenever it rains.

ii. The development of this project is considered economically viable, socially acceptable and environmentally sound if EMP outlined is adhered to and regular audits for continual improvement undertaken.

iii. This SEIA project report therefore presents findings of "no significant impacts".

Recommendation

The EIA team recommends that:

i. The proponents be issued with an EIA license on condition that the proposed ESMP will be implemented in line with other conditions that NEMA may impose during the decision making process.

ii. The proponents should use the ESMP as monitoring and evaluation tool to submit an Environmental Audit report to NEMA annually or as may be directed by the Authority without fail.

iii. Periodic water quality tests should be carried out during operation phase of the proposed project in order to find out whether wastewater quality meets applicable standards. The Authority should have a fully equipped laboratory to analyze samples from the proposed wastewater treatment facility.

iv. The proponents are obliged to undertake all the operations within the applicable legal limits.

v. The proponent conducts regular EIA audit based on the Environmental Management Plan (EMP) for this project for continuous improvement

CHAPTER ONE: INTRODUCTION

1.1 Project Background

Tana Water Works Development Agency (TWWDA) was established under section 65(1) of the Water Act, 2016 vide Legal Notice No. 27 of 26th April 2019. The Agency is one of the nine (9) Water Works Development Agencies established under the Ministry of Water, Sanitation and Irrigation.

The Agency's mandate is: ***to undertake the development, maintenance and management of the National Public Water Works within its area of jurisdiction***.

Dedan Kimathi University of Technology (DeKuT) was established under the University's Act 2012 by the Government of Kenya in December 2012. It is a Public University that focuses exclusively on Technology. It is the successor of Kimathi University College of Technology (KUCT), a constituent college of Jomo Kenyatta University of Agriculture and Technology (JKUAT) that was established in 2007.

The current wastewater system and wastewater treatment plant for DeKUT was constructed in 2008. The system comprises of sewer lines serving Catholic Hostels which offer accommodation to DeKUT students, the neighboring estate, the show ground area and the University administration and lecture area. The system consists of waste stabilization ponds (WSP) with a design capacity of approximately 350m^3/day and a trunk sewer approximately 2.5 kilometers of 225mm uPVC pipes. Currently the waste water treatment plant receives an inflow of about 500m^3/day. This caters for about 50% of the University population and about 5% neighboring estates that accommodate the university students. The treatment plant is managed by the University staff.

The Nyeri Water & Sanitation Company Limited (NYEWASCO) was incorporated on 23rd September 1997 under the Kenya Companies Act Chapter 486 and commenced operations in July 1998. It's a licensed Water Service Provider for Nyeri Sub-County and its environs. Its main mandate is to provide high quality water and sewerage services to the people of Nyeri sub county and its environs. NYEWASCO is responsible for the treatment and disposal of the sewerage within this service area. DeKuT falls within the SPA of NYEWASCO. However the sewerage system under NYEWASCO has not extended to high concentration area like DeKuT area and other areas proposed in this project.

The wastewater to be treated in this project is mainly domestic wastewater that has been used by water users. It contains all the waste materials added to the clean fresh water during its use. It is thus composed of *human body wastes* (feces and urine) together with the water used for flushing toilets, and *sullage*, which is the wastewater

resulting from personal washing, laundry, food preparation and the cleaning of kitchen utensils.

The sewerage wastewater is the grey turbid liquid that has an earthy but inoffensive odor. It contains large floating and suspended solids (such as faeces, cloth rags, plastics, and maize cobs), smaller suspended solids (such as partially disintegrated faeces, paper, and vegetable peel) and very small solids in colloidal (i.e. non-settleable) suspension, as well as pollutants in true solution. It is objectionable in appearance and hazardous in content, mainly because of the number of disease-causing ('pathogenic') organisms it contains. This project area is located mainly in warm climate area therefore wastewater easily loses its content of dissolved oxygen and becomes 'stale' or 'septic'. The septic wastewater has offensive odor, usually of hydrogen sulphide.

The composition household waste forms the wastewater. The organic fraction of the wastewater composes principally of proteins, carbohydrates and fats. These compounds, particularly the first two, form an excellent diet for bacteria, the microscopic organisms whose voracious appetite for food is exploited in the microbiological treatment of wastewater. In addition to these chemical compounds, faeces and, to a lesser extent, urine contain many millions of intestinal bacteria and smaller numbers of other organisms. The majority of these are harmless – indeed some are beneficial but an important minority is able to cause human diseases.

The sullage contributes a wide variety of chemicals: detergents, soaps, fats and greases of various kinds, pesticides in small quantities, anything in fact that goes down the kitchen sink, and this may include such diverse items as sour milk, vegetable peelings, tea leaves, soil particles (arising from the preparation of vegetables) and sand (used to clean cooking utensils).

1.2 Scope and Criteria

The study was commissioned largely to comply with provisions of the Environmental Management and Coordination Act (EMCA) of 1999, (amended) 2015 and the Environmental (Impact Assessment and Audit) Regulations of 2003 amended 2019.

The study has been conducted to evaluate the potential and foreseeable impacts of the proposed development. The physical scope is limited to the proposed site and the immediate environment as may be affected by or may affect the proposed project. This report includes an assessment of impacts of the proposed site and its environs

1.3 The ESIA specific terms of reference

i. Prepare an executive summary
ii. Provide in-depth description of the proposed project with description of site inclusive;
iii. Providing baseline information
iv. Description of key works during installation, operationalization and decommissioning

v. A review of the policy, legislative and administrative framework for the proposed development project likely to negatively affect environment;
vi. Public participation and summary of findings from stakeholder inputs who were involved;
vii. Identify and assess sources of adverse environmental impacts during installation, operationalization and decommissioning of works;
viii. Assessment of economic and socio-cultural impacts to the local community and the nation in general;
ix. Provisions for Health and safety of workers including support staff and Operations and maintenance workers
x. Provide analysis of alternatives to each of the proposed development project components including project site, design and technologies and the reasons for preferring the proposed site, design and technologies
xi. Prepare an elaborate Environmental & Social Impacts Management Plan (ESMP)
xii. Give a conclusion and recommendations that ensure the proposed project's sustainability
xiii. Prepare the ESIA report
xiv. Submit the required hard copies and soft copy of the ESIA report to NEMA to allow review and approval of the proposed project by NEMA

1.4 Project Justification

There is an acute need of appropriate and adequate sanitation facilities in all urban and peri urban areas. Sanitation is the key infrastructure component which is required to reduce the unacceptably heavy toll of excreta-related diseases. Sanitation coverage in most urban areas in Kenya is currently decreasing and urbanization is actually increasing. In many (but obviously not all) peri urban situations the sanitation technology of first choice is simplified sewerage treatment through cess pool or septic tanks with French drains though land for these technologies is diminishing.

The expansion of the sewerage treatment system, construction of additional Decentralized Treatment Facilities (DTFs) and extension of trunk sewers and lateral sewer lines is likely to trigger environmental and social impacts. These potential impacts have to be mitigated for the project to be environmentally friendly, socially acceptable and economically viable. In accordance with the EMCA, 1999, amended 2015 all new projects must undergo environmental impact assessment study such as to comply with the EIA Regulation, 2003 amended 2019. The proposed intervention projects are expected to have an overall positive impact to the people and the environment. However, construction phases and certain aspects of the operations are anticipated to have environmental and social impacts that would require to be mitigated.

The Chaka and Nyaribo areas have poorly drained cotton soils and there is a huge drainage challenge as the wastes tend to be logged with the subsurface water and requires very frequent exhaust services that are too expensive. The toilets also often sink during rains making the sanitation services in these localities a very expensive undertaking. Storm drains flow on soil surface mixed with wastewater and these are

very unsightly and the land values have stagnated due to the poor drainage. The public health sector has as well noted high prevalence of waterborne diseases in unsewered and poorly drained localities transferring the high disease burdens to the health sector as well as low productivity of the residents due to diseases. The student population is increasing and the local community has to keep adding more hostels to accommodate students and this has strained the sanitation facilities in place.

1.5 Location of the Site

The proposed sewerage expansion project for DeKUT covers a wide area in Gatende (near Kingóngó) area off Nyeri- Nyahururu highway with different owners of the land for the varied estates and organizations under the jurisdiction of NYEWASCO, a water and sanitation services provider in Nyeri sub county. The parcel of land lies on coordinates -0.39489 south of the equator and longitude of 36.96459 East. The proposed sewer expansion projects are located in areas ranging from DeKUT wastewater treatment plant to Kieni West area of Njengú (Embassy area) extending to Chaka Township and Nyaribo market.

FIG 1.1: PROPOSED DEKUT SEWERAGE PROJECT AREAS

1.6 METHODOLOGY

Participatory methodologies were employed during the study. They included consultations and observations with a wide variety of stakeholders. The tools employed for this assessment were:

i. Desktop review pertaining to project activities and salient environmental, socio-economic and other features of the project area;

ii. Analysis of topographical and other relevant demographic documentation;
iii. On site reconnaissance surveys to interrogate the various expected impacts
iv. Structured interviews with key project stakeholders through administration of questionnaires
v. Focussed Group Discussions to address contentious issues raised in the questionnaires

CHAPTER TWO: BASELINE INFORMATION

2.1 Location of the project

The proposed sewerage expansion project for DeKUT covers a wide area in Gatende (near Kingóngó) area off Nyeri- Nyahururu highway with different owners of the land for the varied estates and organizations under the jurisdiction of NYEWASCO, a water and sanitation services provider in Nyeri sub county. The parcel of land lies on coordinates -0.39489 south of the equator and longitude of 36.96459 East. The proposed sewer expansion projects are located in areas ranging from DeKUT wastewater treatment plant to Kieni West area of Njengú (Embassy area) extending to Chaka Township and Nyaribo market.

The Nyeri Water and Sewerage Company Ltd (NYEWASCO) is the authorized and licensed water provider in Nyeri town and its environs. The proposed project area is within the service provision area of NYEWASCO. The key technical functions of NYEWASCO is the treatment and disposal of the sewerage within the Service provision Area (SPA). Dedan Kimathi University of Technology (DeKUT) property and infrastructure are all located within NYEWASCO SPA therefore NYEWASCO is the key stakeholder to provide the relevant data of the water supplied to all the proposed project areas. The same NYEWASCO shall provide the sewer pipeline where the new sewers shall be connected.

The project areas under consideration are:-

i. Cluster 1:
   DeKUT Institutions, Kabiruini Show Grounds, KDF Camp, Major Seminary, Makao Estates, Kahawa Ridge Estate, Embassy area, , KIE, and Nyeri View
ii. Cluster 2:
   Nyaribo Center
iii. Cluster 3:
   Chaka Town.

The figure below shows a google map extract on the location and boundary of all the above mentioned project area based on joint reconnaissance survey held on 5th May 2021.

FIG 2.1: DEKUT SEWERAGE PROJECT AREA BOUNDARIES

PLATE 2.2: NYARIBO DEVELOPMENTS

PLATE 2.3: SHOW GROUND ESTATE DEVELOPMENTS

PLATE 2.4: DEKUT INTAKE WORKS

PLATE 2.5: DEKUT UNATTENDED FACULTATIVE PONDS

PLATE 2.6: A PHOTO OF CLEAN MATURATION PONDS IN DEKUT

PLATE 2.7: MAKAO ESTATE

2.2 Administrative location

Nyeri Sub County is a mix of urban and peri urban areas composed of residential homes and a few shops. Nyeri Water & Sewerage Company Ltd, operates within Nyeri Town Sub County which covers an area of 244 km2 but most parts of the project area are essentially rural and outside the main town. The water supply system serves approximately 90% of the population while the sewer network serves only half of the DeKUT main campus with less than 5% coverage of the neighboring Catholic hostels. The area has witnessed some progressive growth after DeKUT became a fully-fledged University.

2.3 Environmental Baseline

This section presents a status report on the situation of the development within the context of Nyeri Sub County as a whole. This project entails extending sewer services to targeted areas to ensure improved access to sanitation services for neighboring low income townships with high potential of growth.

The baseline offers both the present and future states of the environment and also takes into account changes which might be occasioned by both natural and anthropogenic activities.

2.3.1 Climate

The county experiences equatorial rainfall due to its location and being within the highland equatorial zone of Kenya. The long rains occur from March to May while the short rains falls from October to December although sometimes this pattern is occasionally disrupted by abrupt and adverse changes in climatic conditions. The annual rainfall ranges from 500mm in dry areas of Kieni plateau to 1,500mm in the Aberdare hills and areas around Mt. Kenya. The climate contains temperatures ranging from an annual minimum of 12^0C to a maximum of 27^0c. It is densely populated with fertile soils especially in the central highland between the Eastern base of Aberdare range and Western slope of Mount Kenya. This project area is located mainly in warm climate area therefore wastewater easily loses its content of dissolved oxygen and becomes 'stale' or 'septic'. The septic wastewater has offensive odor, usually of hydrogen sulphide.

2.3.2 Physical Environment

Topography: The topography of Nyeri county is often characterized by steep ridges and valleys, occasionally interrupted by hills such as Karima, Nyeri and Tumutumu. The northern part of the sub county is flat, whereas further southwards and western, the topography is characterized by steep ridges and valleys. To some extent these hills affect the pattern of rainfall, thus influencing the mode of agricultural production in some localized areas. The major rivers found in the county are: Sagana and Chania. These rivers and other numerous streams make the county self-sufficient in surface and sub-surface

water resources for domestic, agricultural and industrial development. The problems associated with physiographic conditions in the county are soil erosion, road construction and farm mechanization. This problem is aggravated by increased exploitation of land for settlement and agriculture. The soils in the county are generally well drained. Only in higher areas of the Aberdares do we find areas with embedded drainage.

Hydrology: - The County's water resource comprises of both ground and surface water. Surface water consists of permanent rivers such as Sagana, Nairobi, Chania, Gura, Roni and Ragati among others. The main catchment areas for the rivers are the Aberdare Ranges and Mount Kenya. There are 49 permanent rivers, 32 water dams, 72 boreholes and other various sources including roof catchment. The quality of the water is good and suitable for domestic, livestock and irrigation purposes. Majority of the population, that is, 41.6 percent take between five and 29 minutes to fetch water for domestic use. The water and sewerage companies also provide sanitation services. Human waste is well disposed with 97.68 per cent of the county population using covered and uncovered pit latrines while 2.32 per cent use other waste disposal methods especially in the informal settlements of Witemere, Kiawara, Majengo, and Ndurutu among others.

Geology: Soils at Nyeri are composed of tropical residual red clay soil developed over slightly to moderately weathered volcanic tuff; the soils are Nitisols with associated andosols that support tea and coffee growing in a humid-cool temperate climate. This soil was found to possess high strength and low compatibility. The area's volcanic stuff is easily recognizable from numerous quarries where it is shaped into building stone.

A baseline soil analysis will be undertaken to establish the level of hydrocarbons prior to the operationalization of the WWTP. This will form a basis for continual monitoring and audit of the impacts of the activities to assess the effectiveness of the Environmental Management plan as the monitoring tool.

2.4 Demographic patterns

The greater Nyeri County had a population of 759,164 people and a population density of 188 people per sq. as at 2019. Nyeri Town, being the largest urban center and hosting the county headquarters has the highest urban and peri urban population and density according to population estimates after 2019 censures. The population is comprised mostly of the young generation.

2.4.1 Land Use

The county has a total area of 987.5 km2 and 758.5 km2 of arable and non-arable land respectively. The larger part of the land is used for food crop while the rest is used for cash crop farming, livestock rearing and farm

forestry. The average land ownership is one (l) hectare per household with an estimated 85 per cent of land owners possessing title deeds. Land is an important factor of production for food crops, cash crops, livestock production and agro-forestry, The county has gazetted forests covering an area of 935.5 sq.km and water mass covering 213 sq.km The main food crops grown in the county are maize, beans, Irish potatoes and vegetables whereas the major cash crops are coffee, tea, horticulture and cut flowers. Tea is grown in the upper zone next to Aberdare's and the Mt. Kenya forest while coffee is grown in the lower region.

Additionally, the main livestock breeds are dairy cattle, poultry, pigs, goats, donkeys, and sheep. On average the land carrying capacity (i.e. Livestock per hectare) is five. Bee keeping and other small stock such as rabbits; guinea pigs and quails are also on the increase.

2.5 Stakeholder Mapping and Analysis

During the field investigations, the Consultants held discussions and interviews with various stakeholders with the view of gathering their comments on various aspects regarding the proposed expansion of DeKUT Sewerage project and incorporating them in the ESIA report.

The project covers a wide area near main campus of Dedan Kimathi University. The project serves the students, university staff and estates covering up to Chaka and around Nyaribo market with few connected to the sewer while others aspire to be connected after the expansion that is to be undertaken. Only around 200 students are housed within the campus with the remaining 8,500 housed at neighboring hostels. The surrounding local community is a major stakeholder with Catholic Church and PCEA church also having establishments to accommodate students as well. The University staff as well as other stakeholders offering support services to the University are also a major stakeholder. Needless to say, the local community are entitled to the sanitation services as they lie within the jurisdiction of provision of sanitation and sewerage services of Nyeri Water and Sewerage Company (NYEWASCO) which also operates closely with the County Government of Nyeri.

The surrounding farmers supply food and other trade items to the university staff and students and locals and positive interactions within this ecosystem is key to ensuring a healthy community. The proponent of this project is Tana Water Works Development Agency (TWWDA) who also work with specialized contractors. The coffee farmers nearby are also directly affected by the activities of this sewerage project as well as Kenya Forest Services who seek to use the treated water for blue gam trees plantation. The riverine ecosystem will directly relate with the waste water treatment facility and Water Resource Authority (WRA) is a key stakeholder.

These stakeholders will be adequately consulted during Consultation and Public Participation meetings that will brief them on the project scope and 200 questionnaire were administered in the five meetings that were conducted with good representation from administrators, relevant agencies and general public in their structured formations to capture the aspirations of all the interested parties within the project scope including traders, learning institutions , land lords, tenants, special

interest groups like youth and women leadership forums as well as people with disabilities and faith based institutions. After filling of the questionnaire and their subsequent analysis, the conflicting comments were addressed through a Focussed Group Discussions (FGD) held at TWWDA Nyeri offices by the ESIA Consultants.

The county infrastructure docket with the inventory of all county roads will provide valuable information on location of wayleaves for passage of sanitation infrastructure when TWWDA seeks consent from them to lay sewer lines. TWWDA will also seek consent from Kenya National Highways Authority (KeNHA) as well as Kenya Urban Roads Authority (KURA) and Kenya Rural Roads Authority (KeRRA) office will be vital in locating the existing sewerlines as well as design of the new sewer lines for the undeveloped plots that are proposed to be covered by sanitation services in this project

Category of Stakeholder	Stakeholder Consulted
Project Proponent	TWWDA
Nyeri County Government	County Executive (Ministry of Environ, Water and Natural Resources)
Public Administration	Deputy County Commissioner, Nyeri Sub County Chiefs
General public	Community barazas (Kahuyo Major Seminary, Nyaribo Market, Kabiruini showground, DeKUT main campus, Kahawa Estate, Makao estate, Embassy, Chaka and Brookeside area
Key Ministries and related agencies	i. Tana Water Works Development Agency (TWWDA) ii. Water Resources Management Authority Public Health & Sanitation iii. Lands office iv. Departments of Roads under Ministry of Roads v. Directorate of Occupational Health and Safety Services
Affected Institutions (Schools and Industrial Institutions)	Kahuyo major seminary, Schools within the project area e.g. Nyaribo Sec School, DeKUT Main Campus
Water Resource Users Authority (WRUA)	Chania River Water Users Association

TABLE 2.1: STAKEHOLDER MAPPING AND ANALYSIS CATEGORIZATION.

2.6 Infrastructure facilities

Energy Sources: The proposed project area gets the bulk of its energy supply from the Kenya Power and Lighting Company (KPLC) for lighting but solid fuel is also used for cooking and heating. LPG gas is majorly used for cooking among the students and staff of DeKUT.

Water Sources: The project area is well served with piped water from the NYEWASCO.

2.6.1 Transport and communication: -

Roads: The project area is well served by a good road network which is tarmacked. The site is accessed via a service road from Nyeri – Nyahururu highway with Nyeri airstrip located in Nyaribo. The feeder murrum roads are also well maintained and reliable routes of transport in the neighboring estates.

Communication: The area is well covered by all mobile service providers (Safaricom, Airtel, Orange and YU) and Telkom Kenya (Land line).

Sanitation: Some parts of the project area near DeKUT have a sewer line although it requires to be expanded to cover the established boundaries. It is served by the NYEWASCO. The proponent will as well expand the existing waste water treatment plant and increase sewer line coverage to the proposed estates within the study area.

2.6.2 Solid Waste

The cleared vegetation, excavated soil, the resultant construction wastes will be the main solid wastes during construction. The main waste generation sources during operationalization will be the received effluents awaiting treatment and the sludge as well as other by products of the treatment process. The types of waste that are generated can be classified as solid wastes including dried sludge, garbage, plastics and other household wastes including diapers, papers, plastics, food remains, human wastes

All types of solid wastes will be sorted at the source, reused, recycled or disposed of as per the set out legal requirements. The wastes could also be reduced through putting structures in place for production and utilization of biogas.

CHAPTER THREE: POLICY, INSTITUTIONAL AND LEGAL FRAMEWORK

3.1 Introduction

The Environmental Management and Coordination Act, 1999 and EMCA (amendment) 2015 and Provisions of the Environmental Management and Coordination (Impact Assessment and Audit) Regulations 2003 amended 2019 was enacted to harmonize and co-ordinate environmental management issues in Kenya by providing for the establishment of an appropriate legal and institutional framework for the management of the environment. Topmost in the administration of EMCA is the National Environmental Council (NEC) which formulates policies, sets goals and promotes environmental protection programs while the implementing institution is NEMA.

Many other institutions (both national and international) deal with environmental issues and they include the Kenya Forest Service (KFS), the Kenya Wildlife Service (KWS), Water Resource Authority (WRA), the National Museums of Kenya (NMK), Kenya Maritime Authority (KMA), World Bank among others.

Environmental Management and Coordination Act No.8 of 1999 amended 2015, Standards Act Cap 496, Food Drugs and Chemical Substances Act Cap 254, Public Health Act Cap 242, Animal Diseases Act Cap 364, OSHA Act 2007, KIPI Act 2013.These are complex issues from a regulatory perspective. It is therefore anticipated that going forward, one of the main challenges regulatory institutions in Kenya will face will be in the area of regulatory capacity, information asymmetry and the question of inter-agency coordination.

The relevant regulations which were reviewed prior to carrying out this ESIA for submission to NEMA and subsequent approval are:

3.2 Environmental Management and Coordination Act No 8 of 1999, Amended 2015

The proponents have undertaken this EIA in order to comply with sections 58 to 67 and 138 of EMCA No. 8 of 1999, amended 2015 and the Environmental (Impact Assessment and Audit) Regulations 2003 (Legal Notice No. 101) amended 2019 which require that all projects listed under the second schedule of the Act undertake an EIA before commencement. The EIA reports are then to be submitted to the National Environment Management Authority (NEMA) for review and eventual licensing before a development commences. This should be followed by annual environmental audits to determine the project compliance with the environmental regulations.

3.3 The Constitution of Kenya

The Constitution of Kenya states under Article 43 (1) (d) that every person has a right to clean and safe water in adequate quantities. It is in the spirit of embracing the Constitution of Kenya that TWWDA is providing the necessary

infrastructure to facilitate NYEW ASCO to provide clean, safe, and adequate water and sewerage services to the people of Nyeri Sub-County and its environs.

3.3.1 County Integrated Development Plan

The Nyeri County Water Sector Vision is “Sustainable access to clean, safe and adequate water in a clean and secure environment". NYEWASCO’s mandate and vision is well placed to enable the county attain this vision especially on the services area covered by NYEWASCO. However a lot of funding is required to attain the targeted county programs. The proposed sewer extension projects are covered under CIDP of Nyeri County.

3.4 Relevant Acts Covered in the Study

3.4.1 Water Act 2002

NYEWASCO seeks to align its operations with the water sector reforms in the context of Water Act 2002 that is stipulated in Act No.8 as "An Act of Parliament to provide for the management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services; to repeal the Water Act (Cap.372) and certain provisions of the Local Government Act; and for related purposes."

3.4.2 Water Act 2016

NYEWASCO is cognizant of the existence of Water Act 2016 that has been enacted by Parliament as an Act of Parliament to provide for the regulation, management and development of water resources, water and sewerage services; and for other connected purposes.

3.4.3 County Water Act

The County Government of Nyeri gazetted its County water Act to guide and direct water and related services in the county. NYEW ASCO aspires to align its operations and services with the spirit of the new County Water Act.

3.4.4 Land Act, 2012 (Revised 2015)

The lands Act was enacted in May 2012 and revised in 2015 to provide for the review, consolidation and rationalization of land laws and to provide a framework for sustainable management and utilization of all categories of land. The act provides the legal framework for administration and management of public and private land, leases, charges, compulsory acquisition, easements and related rights. Section 61 of Kenyan constitution recognizes three classification of land namely;

Public land: It includes all un-alienated government land held and occupied by government agencies, territorial sea and sea bed, all public roads whether gazetted or not and any land not classified as private or community land under

the Constitution; and any other land declared to be public land by an Act of Parliament.

Community land: This is all land vested in and held by communities identified on the basis of ethnicity, culture or similar community of interest. Any unregistered community land shall be held in trust by county governments on behalf of the communities.

Private land: This is land which is registered and held by any person under freehold tenure; or land held by any person under leasehold tenure; and any other land declared private land under an Act of Parliament.

Even though most of the sewer lines will be laid along the public road reserve, way leave will be required in areas where it passes through private land. The pump station if adopted as is one of the options for Chaka and Nyaribo areas will necessitate land acquisition. As such valuation for purposes of compensation for loss of land and land use of affected persons will be conducted.

The valuation practice in Kenya is governed by the Valuers Act Cap 532, which provides for a Valuers Registration Board that regulates the activities and conduct of registered valuers. The Act governs the formation and composition of valuation practices including the qualification of partners and directors in charge of valuation. The Board also deals with discipline and complaints in respect to valuation practice. Other statutes that govern valuation are the Government Lands Act Cap 280 that regulates the valuation for land rent while valuation for rating is governed by the Rating Act Cap 267. Land Acquisition Act Cap 295 governs valuations for compulsory acquisition purposes.

3.4.5 The Kenya Roads Act of 2007

The Act stipulates the legal and institutional aspects of the road sub-sector policy. The Act provides for the establishment of three independent Road Authorities, namely:

Kenya National Highways Authority responsible for the administration, control, development and maintenance of all class A, B and C roads in Kenya

Kenya Rural Roads Authority, responsible for rural and small town roads including class D, E roads and Special Purpose Roads

Kenya Urban Roads Authority responsible for all City and Municipal Roads. The Authorities fall under the Ministry of Transport and Infrastructure, which will retain the role of policy formulation, and general oversight of public roads including regulatory aspects such as technical standards.

Section 22 of the Act details the procedure for acquisition of any land required by an authority for the purposes of its function

3.4.6 Way-leaves Act (Cap 292)

Under Section 3 of this Act, the Government may carry any sewer, drain or pipeline into, through, over or under any lands whatsoever but may not in so doing interfere with any existing building. The proposed sewer connection projects will require way leave acquisition consent from relevant road authorities since most of the infrastructure is expected to follow the road network with a few exceptions passing through private land. In such instances negotiations with the land owners on way leave acquisition and compensation on loss of use should be conducted prior to project implementation. The Proponent also intends to secure some land for Decentralized Treatment Systems at Chaka and Nyaribo to save on recurrent pumping costs of pumping the sewage to DeKUT treatment plant that is also to be expanded. Most of the sewer infrastructure will utilize road reserve along existing road networks. The proponent will therefore be expected to liaise with the relevant road authorities in acquisition of necessary permits or consent.

3.4.7 Physical Planning Act, (Rev 2009)

30. (1) No person shall carry out development within the area of a local authority without a development permission granted by the local authority under section 33.

(2) Any person who contravenes subsection (1) shall be guilty of an offence and shall be liable to a fine not exceeding one hundred thousand shillings or to an imprisonment not exceeding five years or to both.

(3) Any dealing in connection with any development in respect of which an offence is committed under this section shall be null and void and such development shall be discontinued.

(4) Notwithstanding the provisions of subsection (2)—

(a) The local authority concerned shall require the developer to restore the land on which such development has taken place to its original condition within a period of not more than ninety days;

(b) If on the expiry of the ninety days' notice given to the developer such restoration has not been affected, the concerned local authority shall restore the site to its original condition and recover the cost incurred thereto from the developer.

Any person requiring development permission shall make an application in the form prescribed in the Fourth Schedule, to the clerk of the local authority responsible for the area in which the land concerned is situated.

The application shall be accompanied by such plans and particulars as are necessary to indicate the purposes of the development, and in particular shall show the proposed use and density, and the land which the applicant intends to surrender for—

(a) Purposes of principal and secondary means of access to any subdivisions within the area included in the application and to adjoining land;

(b) Public purposes consequent upon the proposed development.

If in connection with a development application a local authority is of the opinion that proposals for industrial location, dumping sites, sewerage treatment, quarries or any other development activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an environmental impact assessment report.

Section 36 states that if in connection with development application a local authority is of the opinion that, the proposed activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an Environmental Impact Assessment report. The environmental impact assessment report must be approved by the National Environmental Management Authority (NEMA) and followed by annual environmental audits as spelled out by EMCA 2015. Section 38 states that if the local authority finds out that the development activity is not complying to all laid down regulations, the local authority may serve an enforcement notice specifying the conditions of the development permissions alleged to have been contravened and compel the developer to restore the land to its original conditions

3.5 Environmental Rules and Regulations

3.5.1 Water Resource Management Rules 2007

The rules set out the procedures for obtaining water use permits and the conditions placed on permit holders. Sections 54 to 69 of the Water Resources Management Rules 2007 impose certain statutory requirements on dam owners and users in regard.

Other sections within the rules imply that WRMA can impose water quality sampling requirements from the water sources and impacts to the hydrology, water chemistry and river morphology downstream basin. Section 16 of the Water Rules requires approval from the Water Resources Management Authority (WRMA) for a variety of activities that affect the water resources, including the storage of water in dams and pans. Approval by WRMA is conferred through a Water Permit. A permit is valid for five years and must be renewed.

Section 104 of the Water Resource Management Rules requires certain water permit holders to pay water use charges. The intention of the water use charges was to raise revenue for water resource management, raise revenue for catchment conservation activities, improve efficiency of water resource abstraction and provide a system of data collection on water resource usage.

The rules sets the standard procedures and rules to be followed in the utilization of water resources including abstraction controls, modes of use and responsibilities in protection of the resources including effluent treatment standards.

3.5.2 Environmental (Impact Assessment and Audit) Regulations 2003, amended 2019, Legal notice No. 31 and 32 of 2019.

These Regulations stipulate how an ESIA will be undertaken and what the ESIA study report should contain. It also provides regulations on Environmental Audits (EA), which the proponent will be required to undertake. The notices also classify the project into either low risk, medium risk or high risk projects which have more widespread, severe and long term impacts on the environment and a sewerage project like this falls under high risk category and necessitates a study report on the proposed impacts and possible mitigation measures. This category also requires the environmental consultant to prepare a Terms of Reference (ToR) that has to be approved by NEMA before the commencement of the actual study report. After review of the report, the proponent as well should invite public comments before NEMA can issue an EIA license.

NB: It is important to note that the proponent will fully comply with section 17 part 1 of EMCA regulation which states that "During the process of conducting an environmental impact assessment study under these Regulations, the proponent shall in consultation with the Authority, seek the views of persons who may be affected by the project"

3.5.3 The Waste Management Regulations-2006

The EMCA Waste Management Regulations, 2006 is the governing law for waste management in Kenya. This regulation is described in Legal Notice No. 121 of the Kenya Gazette Supplement No. 69 of September 2006. The objective of this Regulation is to protect human health and the environment. The regulations consist of eight parts and classify various types of waste and recommended appropriate disposal methods for each waste type. This also contains requirements for handling, storing, transporting and treatment of all waste categories as provided therein. The regulations also specified a series of responsibilities for the waste generator. As Kenya develop towards achieving Vision 2030 its imperative that all forms of development and waste associated with it is managed in a responsible manner The regulations place emphasis on waste minimization, cleaner production and segregation of waste at source. The regulation requires licensing of transporters of wastes and operators of disposal site (sections 7 and 10 respectively). Of immediate relevance to proposed development for the purposes of this project report is Part II Sections 4(1-2), 5 and 6.

i. Section 4 (1) states that "No person shall dispose of any waste on a public highway, street, road, recreational area or any other public place except in a designated waste receptacle". Section 4(2) and 6 explain that the waste generator must collect, segregate (hazardous waste from non-hazardous) and dispose waste in such a facility that shall be provided by the relevant local authority.
ii. Section 5 provides method of cleaner production (so as to minimize waste generation) which includes the improvement of production processes through conserving raw materials and energy.

iii. Section 11 provides that any operator of a disposal site or plant shall apply the relevant provisions on waste treatment under the local government act and regulations to ensure that such waste does not present any imminent and substantial danger to the public health, the environment and natural resources. The Developer/contractor is expected to take all responsibility to ensure that solid waste is properly handled, stored, transported and disposed as per the procedures provided in these regulations. The waste must be transported by NEMA licensed transporter and disposed in waste treatment facility that is approved by the authority.

3.5.4 The Water Quality Regulations -2006

The EMCA Water Quality Regulation – 2006 deals with protection of water quality and applies to drinking water, industrial water, effluent discharge, water used for agricultural, recreational, fisheries, wildlife and other purposes The Water Quality Regulations (2006) are contained in the Kenya Gazette Supplement No. 68, Legal Notice No. 120. Water Quality Regulations apply to water used for domestic, industrial, agricultural, and recreational purposes; water used for fisheries and wildlife purposes, and water used for any other purposes. Different standards apply to different modes of usage. These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources. It is an offence to contravene the provisions of these regulations with a fine not exceeding five hundred thousand shillings.

In addition, of immediate relevance to the proposed project for the purpose of this Project

Report is Part II Sections 4-5 as well as Part V Section24.

i. Part II Section IV states that “Every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution”.
ii. Part IV Section 24 states that “No person shall discharge or apply any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants or permit any person to dump any such matter into water meant for fisheries, wildlife, recreational purposes or any other uses”.

According to these regulations, “Every person shall refrain from any action which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act”. All waste water shall be channeled to the sewer line so as not to pollute the ground and surface water and if a pollution incidence occurs the contractor/proponent shall notify the authority immediately. The

contractor/proponent will handle hazardous substances in a manner that is not likely to cause water pollution

This Act is divided into 6 Parts as follows:

i. Quality standards for sources of domestic water;
ii. Monitoring for sources of domestic water;
iii. Standards for effluent discharge into the environment;
iv. Monitoring guide for discharge into the environment;
v. Standards for effluent discharge into public sewers and,
vi. Monitoring for discharge of treated effluent into the environment

3.4.5 Environmental Management and Coordination (Noise and Excessive Vibration, and Pollution Control) Regulations, 2008

The contractor shall put in place all applicable measures in order to manage impacts of noise, vibration and pollution. These measures will save the proponents the costs of applying for noise licenses from the Authority as under r*egulation 16 (1)* as stated below.

Where a sound source is planned, installed or intended to be installed or modified by any person in a manner that such source will create or is likely to emit noise, or excessive vibrations, or otherwise fail to comply with the provisions of these Regulations, such person shall apply for a license to the Authority.

3.4.6 Air Quality Regulations 2014

The proponent shall prevent, control and abate air pollution to ensure clean and healthy ambient air for both internal and external environment as set out under part 1 of the Fifth Schedule. The proponent shall as well file an emission assessment report with NEMA on a regular basis. The air emissions shall be monitored so that they do not pose negative health impacts to the surrounding population.

The objective of these Regulations is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. The overall objective is to protect human health and to allow for safety. The regulations under section 31 require an owner or occupier of a controlled facility shall- (a) inform the workers of the hazards in specific work environments; (b) train the workers on the potential hazards of any hazardous substance to which they are exposed and the safety precautions to be taken to prevent any harm to their health; (c) Take exposure reduction measures recommended under Part IX of the Fifth Schedule of these regulations. The regulations prohibit, any person from causing the emission of air pollutants (such as liquid and gaseous substances) and suspended particulate matter listed under Second Schedule (Priority air pollutants) to exceed the ambient air quality levels as stipulated under the Second Schedule (Ambient air quality tolerance limits) and Seventh Schedule (Emission limits for controlled and non-controlled facilities).

3.5 Institutional Structure of the Water Sector

3.5.1Ministry of Water and Irrigation (MWI)

This is the overall Ministry in charge of water and sewerage in Kenya. It is responsible for policy development, sector co-ordination, monitoring and supervision to ensure effective Water and Sewerage Services in the Country, sustainability of Water Resources and development of Water resources for irrigation, commercial, industrial, power generation and other uses. Its mission statement is to contribute to national development by promoting and supporting integrated water resource management to enhance water availability and accessibility. The MWI has the following technical departments: Water Services, Water Resources, Water Storage and Land Reclamation, and Irrigation and Drainage. The Ministry executes its mandate through the following sector institutions presented below.

3.5.2 Water Services Trust Fund (WSTF)

The Water Services Trust Fund (WSTF) serves to assist in the financing of water deficient service area through providing financial support to improve water services towards;

i. Active community participation in the management of water services
ii. Capital investment to community water schemes in underserved areas
iii. Capacity building activities and initiative among communities
iv. Water services activities outlined in the Water Services Strategic Plan as prioritized by the Government
v. Awareness creation and information dissemination regarding community management of water services

3.5.3 Water Resources Authority (WRA)

The Authority is responsible for sustainable management of the nation's water resources; implementation of policies and strategies relating to management of water resources; develop principles, guidelines and procedures for the allocation of water; development of catchments level management strategies including appointment of catchments area advisory committees; regulation and protection of water resources quality from adverse impacts; and classification, monitoring and allocation of water resources

3.5.4 Water Services Regulatory Board (WASREB)

The regulatory Board is responsible for the regulation of the water and sewerage services in partnership with the people of Kenya. Its mandate covers the following key areas;

i. Regulating provision of water and sewerage services including licensing, quality assurance and issuance of guidelines for tariffs, prices and disputes resolution.
ii. Overseeing the implementation of policies and strategies relating to provision of water services licensing of Water Services Boards and approving their appointed Water Services Providers,
iii. Monitoring the performance of the Water Services Boards and Water Services Providers,
iv. Establishes the procedure of customer complaints,
v. Informs the public on the sector performance,
vi. Provides advice to the Minister in charge of water affairs.

3.5.5 Water Services Boards (WSBs)

The WSBs are responsible for the efficient and economical provision of water and sewerage services in their areas of jurisdiction. Nyeri Water and Sewerage Company (NYEWASCO) being the implementer of the project fall under the jurisdiction of Tana Water Services Board. The board shall assist in preparation of performance targets for the project which will directly have an impact on provision of water and sanitation services to the proposed estates.

3.5.6 Water Services Providers

Water Service Providers are the utilities or water companies. NYEWASCO being the implementer of the proposed sewer extension projects, will be responsible for the following:

i. Ensure effective communication of all matters related to project to the target group.
ii. Sensitize the community for buy in of the project and ensure its sustainability.
iii. Ensure implementation of the project in accordance with the project rules

3.6 Rio Declaration on Environment and Development (1992)

Principle No. 10 of the declaration underscores that environmental issues are best handled with participation of all concerned citizens at all the relevant levels. At all levels, each and every individual shall have appropriate access to information concerning the environment that is held by public authorities. The proponents encouraged and facilitated public participation at the site.

3.7 Physical Environment

3.7.1 Building Code 2000

This by-law recognizes the Local authorities as the leading planning agencies. It compels potential developers to submit development application for the approval.

The local authorities are hence empowered to approve or disapprove any plans if they do or don't comply with the law respectively.

Any developer who intends to erect or renovate a building as herein proposed must give the respective local authority a notice of inspection before the erection of the structure. On completion of the structure, a notice of completion shall be issued by the local authority to facilitate final inspection and approval. No person therefore shall occupy a building whose certificate of completion has not been issued by the local authority.

Section 214 of the by law requires that any public building where the floor is more than 20 feet above the ground level should be provided with firefighting equipment that may include one or more of the following: - hydrants, hose reels and fire appliances, external conations portable fire appliances, water storage tanks, dry risers, sprinkler, drencher and water spray spring protector system.

3.8 Public Health

3.8.1 Public Health Act Cap 242 (Revised 1986)

Part IX section 115 of the Act states that no person or institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that local authorities take all lawful necessary and reasonable practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to injuries or dangerous to human health. Nuisances under this Act include any noxious matter or waste water, flowing or discharged from any premises wherever situated, into any public street, or into the gutter or side channel of any street or watercourse, or any accumulation or deposit of refuse or other offensive matter. Every municipal council and every urban area council may make by-laws as to buildings and sanitation**.** Further, part XII, Section136, states that all collections of water, sewage, rubbish, refuse and other fluids which permits or facilitates the breeding or multiplication of pests shall be deemed nuisances and are liable to be dealt with in a manner provided for by this Act. (GOK, 1986). The main contractor and the proponent will be required to provide sanitary facilities and solid waste handling containers for use by the construction workers on site during construction and operation phases. A licensed solid waste transporter will also be contracted to collect all solid waste from the site for dumping at approved sites. Wastewater from the proposed project developments during the operational phase will be channelled to the sewer line. The final effluent must meet the stipulated standard for disposal into the sewer line.

3.8.2 The Penal Code CAP 63

Chapter XVII on "Nuisances and offences against health and convenience" contained in the penal code strictly prohibits the release of foul air into the environment which affects the health of the persons. It states "Any person who voluntarily vitiates the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighbourhood or passing along a public way is guilty of a misdemeanour"

3.8.3 Occupational Safety and Health Act, 2007

The Act covers provisions for health, safety and welfare of workers in any place of work. The Act states that before any premises are occupied, or used, a certificate of registration must be obtained from the chief inspector. The occupier must keep a general register.

3.8.4 Safety

Training and supervision of inexperienced workers should also be conducted. Floors, passages, gangways, stairs, and ladders must be soundly constructed and properly maintained and handrails must be provided for stairs. Adequate and suitable means for extinguishing fire must be provided in addition to adequate means of escape in case of fire must be provided.

3.8.5 Health

The premise must be kept clean, daily removal of waste from the site, free from effluvia arising from any drain, sanitary convenience or nuisance and without prejudice to the generality of foregoing provision. The circulation of fresh air must secure adequate ventilation of the development. There must be sufficient and suitable lighting in every part of the workplace in which persons are working or passing.

3.9 Gender Mainstreaming and Youth affairs

3.9.1 Gender Policy, 2011

The Gender Policy aims at mainstreaming gender concerns in the national development process in order to improve the social, legal/civic, economic and cultural conditions of women, men, girls and boys in Kenya. It provides direction for setting priorities to ensure that all ministerial strategies and their performance frameworks integrate gender equality objectives and indicators and identify actions for tackling inequality. In addition, each program will develop integrated gender equality strategies at the initiative level in priority areas. Within selected interventions, the policy will also scale-up specific initiatives to advance gender equality. The proponent will spearhead the requirements of gender equality advocated in this policy throughout the project implementation.

3.10 International Safeguards

3.10.1 World Bank OP/BP 4.12 (Involuntary Resettlement)

The policy states that "Where large-scale of population displacement is unavoidable, a detailed resettlement plan, timetable, and budget are required. This project will not lead to large scale displacement but only a few people may need to pave way especially for the proposed Decentralized Treatment facilities in Nyaribo and Chaka areas where pumping could be an option but the recurrent cost may be a hindrance to the sustainable operationalization of the project. Resettlement plans should be built around a development strategy and package aimed at improving or at least

restoring the economic base for those relocated. Experience indicates that cash compensation alone is normally inadequate. Voluntary settlement may form part of a resettlement plan, provided measures to address the special circumstances of involuntary resettles are included. Preference should be given to land- based resettlement strategies for people dislocated from agricultural settings. If suitable land is unavailable, non-land-based strategies built around opportunities for employment or self- employment may be used".

Involuntary resettlement is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The objective of this policy is to avoid or minimize involuntary resettlement, though participation in resettlement planning and implementation and, where this is not feasible, to assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects. There are no major anticipated displacements by this project but the few who risk to be displaced for the DTFs will trigger resettlement action plan (RAP) if they their lives were pegged on the affected land including settlement and sources of livelihood.

CHAPTER FOUR: PROJECT DESCRIPTION

4.1 Introduction

The objectives of this consultancy is to develop the most cost- effective system to address sewage collection, treatment and disposal within Nyeri Sub County. The output of this Sewerage Project is a design output that is focused on a system that is:-

i. Capable of performing the intended functions throughout the 20 year design life of the project;

ii. Environmentally acceptable, both during construction and in the long term;

iii. Economical in terms of both capital and recurrent costs.

It is envisaged that upon completion of the study, the opportunity to take advantage of following benefits will result:

i. Rapid implementation to deliver the project on a fast track schedule.
ii. Significant improvements in protection of human health and dignity.
iii. Protection and enhancement of the overall ecological environment.
iv. Improvement in quality of life by ensuring availability of organized and flexible schemes and plans for implementing short-term and long-term sewerage infrastructure improvements suitable for future development within each un-sewered area.
v. Opportunities for improvements in institutional and organizational capacity for sustainable solutions, with possible full cost recovery and coordination among various institutions for cost-effective capital improvements and operation and maintenance activities.
vi. Acceptance and support of stakeholders for good governance

Wastewater operations can range from pre-treatment to full-scale treatment processes. In a typical pre-treatment facility, process and/or sanitary wastewater and/or storm water runoff is collected, equalized, and/or neutralized and then discharged to a wastewater treatment plant with specific characteristics like TDS, COD, NH4 - N, *etc.,* where it is then typically treated further.

This chapter describes the proposed projects in terms of their geographic location, proposed design and materials and activities at various phases of project implementation. This helps identify the extent of the project's impact. The proposed project activities described, design and materials borrows largely from the Design report. The parcel of land under consideration lies on coordinates -0.39489 south of the equator and longitude of 36.96459 East. The proposed sewer expansion projects are located in areas ranging from DeKUT wastewater treatment plant to Kieni West area of Njengú (Embassy area) extending to Chaka Township and Nyaribo market.

The project areas under consideration are:-

i. Cluster 1:

DeKUT Institutions, Kabiruini Show Grounds, KDF Camp, Major Seminary, Makao Estates, Kahawa Ridge Estate, Embassy area, , KIE, and Nyeri View

ii. Cluster 2:

Nyaribo Center

iii. Cluster 3:

Chaka Town.

FIG 4.1: DEKUT SEWERAGE PROJECT AREA AND PROPOSED BOUNDARIES

4.1.1 The Infrastructural General Status

The sewerage coverage in Nyeri Sub County and especially the proposed project area stands at less than 10%. This implies minimal sewer network and where it is present there is low connectivity or poor integrity of the sewer lines. This calls for either rehabilitation of the sewer lines and laying new sewer lines in areas not covered under the existing network.

4.2 Proposed Options for Waste Water Treatment

4.2.1 Technical Methods of WWTP Considerations and Analysis

The Wastewater treatment, also called sewage treatment is the removal of impurities from wastewater, or sewage, before it reaches aquifers or natural bodies of water such as rivers. There are standards which has been set by the regulating bodies that has to be met before discharge into the natural water bodies.

At Feasibility Study stage, the project areas delineated for off-site interventions were earmarked to receive a full level of sewer network coverage upon implementation of

the project by employing either of the following systems as applicable to the specific sub-project site conditions.

FIG 4.2 ABOVE: THE LAYOUT PLAN FOR DEKUT PLANT SEWERS

Option1: DeKUT Conventional Sewer System.

The proposed conventional system in DeKUT will be to improve the existing system by:-

1. Building a new inlet works with mechanized coarse and fine screens.
2. The grit removal system with an air blower to break down solids.
3. Better grit collection system
4. Incorporate ultrasonic flow meter to measure sewer inflow and out flow
5. Improve anaerobic pond.
6. Have three series facultative ponds
7. Have two maturation ponds
8. Introduce new a sludge digester
9. Improved new sludge drying beds
10. Have bio-gas collection and purification unit.

11. Build new onsite water testing laboratory

This unit is expected to treat sewer in cluster 1: DeKUT institutions, Kabiruini show ground area, KDF camp, Catholic hostel, Upper catholic area, Nduta estate, Makao estate and Embassy area.

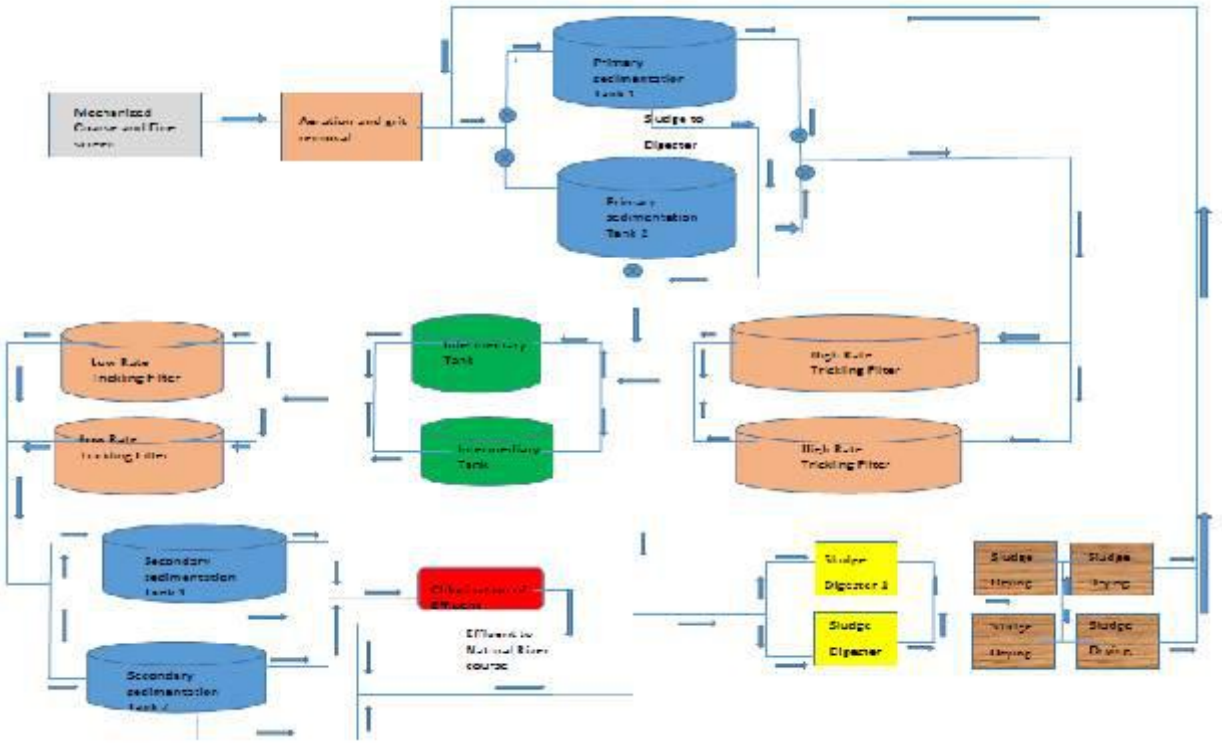

FIG 2:2 SCHEMATIC LAYOUT OF PROPOSED DEKUT SEWERAGE PLANT

Option 2: DeKUT Conventional Sewer System Second option.

Design a new conventional system in DeKUT and decommission the old one as follows:-

i. Build new inlet works with mechanized coarse and fine screens.
ii. Grit removal system with air blower to break down solids.
iii. Grit collection system
iv. Install Ultrasonic flow meter at the inlet and outlet works
v. Two primary sedimentation tanks.
vi. Two high rate trickling filter
vii. Intermediary Humus tank.
viii. Two Low rate tricking filter
ix. Final sedimentation tank.
x. Two facultative ponds.
xi. Two maturation ponds

xii. New onsite water testing laboratory and Staff housing.

This unit is expected to treat sewer in cluster 1: DeKUT institutions, Kabiruini show ground area, KDF camp, Catholic hostel, Upper catholic area, Nduta estate, Makao estate and Embassy area.

Option3: DeKUT Conventional Sewer System Third Option.

Propose a new conventional system in DeKUT and decommission the old one. This unit will treat sewer from This unit is expected to treat sewer in cluster 1: DeKUT institutions, Kabiruini show ground area, KDF camp, Catholic hostel, Upper catholic area, Nduta estate, Makao estate and Embassy area.

i. Build a new inlet works with mechanized coarse and fine screens.

ii. Grit removal system with air blower to break down solids.

iii. Alum dosing unit at the air blower point to allow mixing of alum.

iv. Grit collection system

v. Ultrasonic flow meter

vi. Two primary sedimentation tanks.

vii. Two high rate trickling filter

viii. Intermediary Humans tank.

ix. Two Low Rate tricking filter

x. Final sedimentation tank.

xi. Chlorine dosing point.

xii. One pond with a capacity to hold water equivalent to 30mins inflow to allow chlorine contact time.

xiii. New onsite small office, two operators houses, and fully equipped waste water testing laboratory

4.3 Chlorination of Effluent option

The idea to chlorinate effluent intend of polishing it up in Facultative and Maturations ponds is relative new in the Kenya water treatment process. In order to simulate and test the effectiveness of these process samples of waste water from Kagemi final secondary sedimentation tank has been used for trial and calculation of required amount of chlorine and the cost. It is assumed that the waste water at DeKUT project is of the same quality as that of Kagemi. The lifestyle of the people in this area is similar to Nyeri town where Kagemi is located.

If DeKUT will have other type of waste water e.g. from Laboratories it will be pretreated before discharge into the waste water plant. There are no land for industries in the project area other than DeKUT institution area hence specific treatment units are introduced as and when need arise.

Chlorination Efficiency of Effluent after Secondary Sedimentation.

The consultant has done trial test at Kagemi WWTP where samples collected at different times and tests were carried out to determine the effectiveness of the polishing of effluent with HTH Chlorine. Five tests were done by NYEWASCO water testing Laboratory. The result showed that it's economical to chlorinate effluent instead of construction of Facultative and maturation ponds.

Proposed Options for the Sewage Treatment Plant for Nyaribo.

The sewer lines in Nyaribo has been planned to gravitate sewer to a common point. See figure 4.3 below

Notes: Blue Lines are proposed sewers

Option 1 for Nyaribo

The interventions at Nyaribo shall join the DeKUT WWTP through gravity flow. The terrain between DeKUT and Nyaribo allows for sewer gravitation through a distance of 6.8KM across Mweiga River. See the profile below. The sewer shall flow by gravity from Nyaribo to Kabiruini and further flow by gravity to DeKUT proposed WWTP. This will include:-

i. Double mechanized screening coarse and fine screening.

ii. A three day retention pond in case of pump breakdown to allow for downtime storage and repair.

iii. A pumping station with a duty and standby pump.

iv. Sewer line from Nyaribo sewer collect center will gravitate to Kabiruini sewer line for transfer to the DeKUT sewerage WWTP.

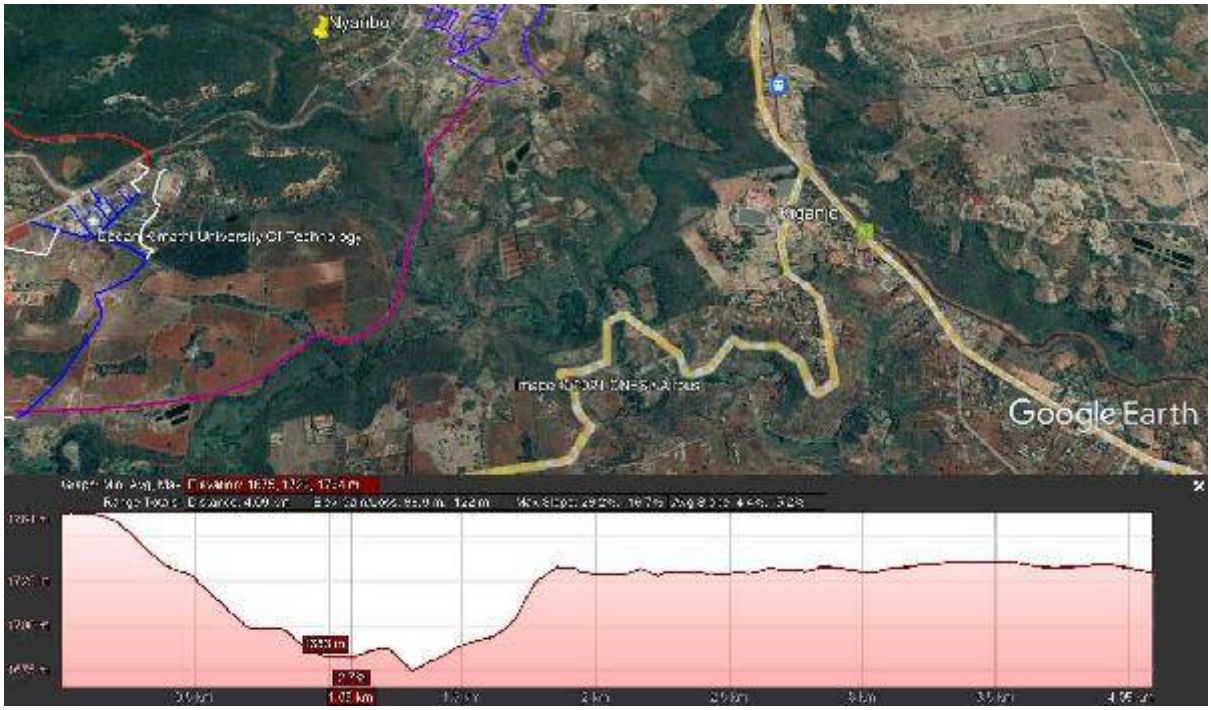

FIG 4.4 NOTE: THE PURPLE LINE SHOWS THE BEST GRAVITY LINE FROM THE CENTRAL COLLECTION POINT AND PRE-SCREENING UNIT.

Project Gravity Line from Nyaribo Primary Screening Unit

The elevation between screening point (1766m asl) and delivery point (1730m asl) ensures that it will join Kabiruini line. The difference in elevation between the inlet and outlet is 36M. There will be no pumping station required.

The works involve:

i. Inlet works with double mechanized screening unit for coarse and fine screening.

ii. Outlet work being a one day storage which allow for sedimentation and decant settled water.

iii. A two day storage tank.

iv. Gravity line 6.8KM to transfer screened and partly settled sewer.

Option 2 for Nyaribo

The interventions at Nyaribo option 2 proposes an independent plant with gravity line to a central point. The WWTP with the following:-

i. Double mechanized screening in coarse and fine screening.

ii. Balancing tank with sludge removal through plain sedimentation of sludge.

iii. Sludge pumping to sludge drying bed.

iv. Chlorination point with a contact time pond of 12m3 which is 1 hour contact time volume

v. Pump to recirculate water from sludge drying bed drainage back to inlet

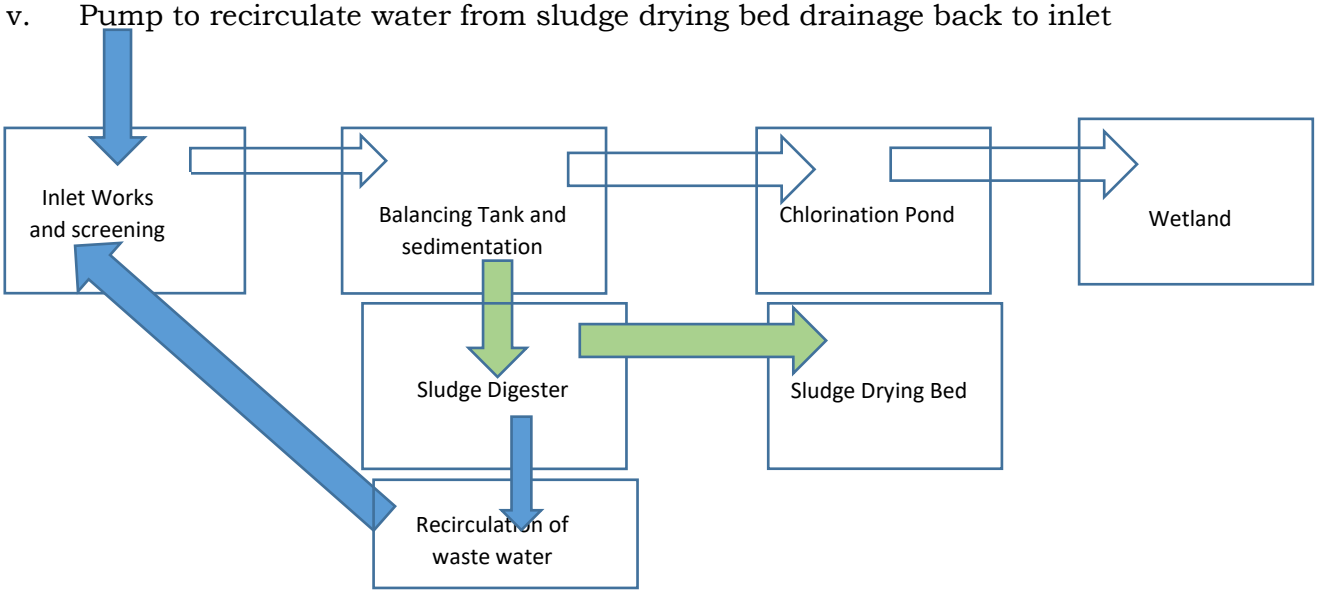

FIG 13.4: NYARIBO WWTP LAYOUT

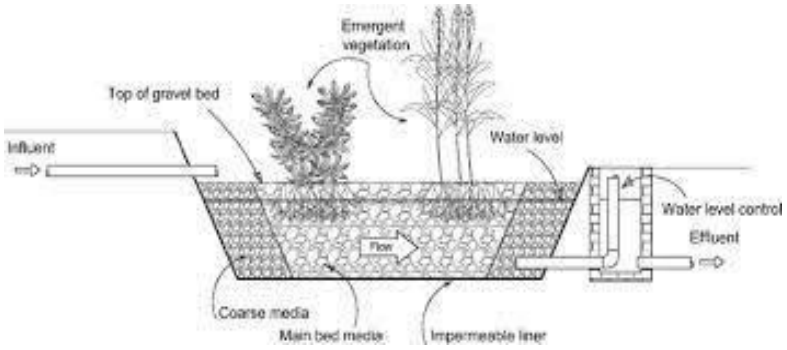

FIG 4.5: NYARIBO TYPICAL WETLAND DESIGN

Proposed Options for the Sewage Treatment Plant at Embassy

The interventions at Embassy is proposed lines which gravitate sewer to Kabiruini sewer for onward transfer to DeKUT WWTP plant. The raw sewer shall flow by gravity for a distance 3.23KM. The sewer will also serve the proposed Cancer center located near Kabiruini show ground.

FIG 4.6: PROPOSED EMBASSY GRAVITY LINE TO DEKUT WWTP.

Proposed Options for the Sewage Treatment Plant for Chaka

The interventions at Chaka shall be independent with gravity line on the western side and a pump station for the Eastern side of Kiganjo – Brookside Road. The terrain in Chaka along the Kiganjo – Brookside Road falls on either side. The sewer on the western side shall flow by gravity to the proposed WWTP and the sewer on the Eastern side shall be corrected at one point, screened and pumped to the western side for treatment at one central point. The proposed site where WWTP shall be treated shall include:-

i. Double mechanized screening in coarse and fine screening.

ii. The plain sedimentation of sludge with 6 six hours retention capacity.

iii. Chlorine dosing point and dozer.

i. Chlorine contact time for 2 hours

ii. Wetland with two days capacity

iii. Two sludge drying bed

iv. Sludge drying bed under drain collection tank and a pump to pump water back to inlet.

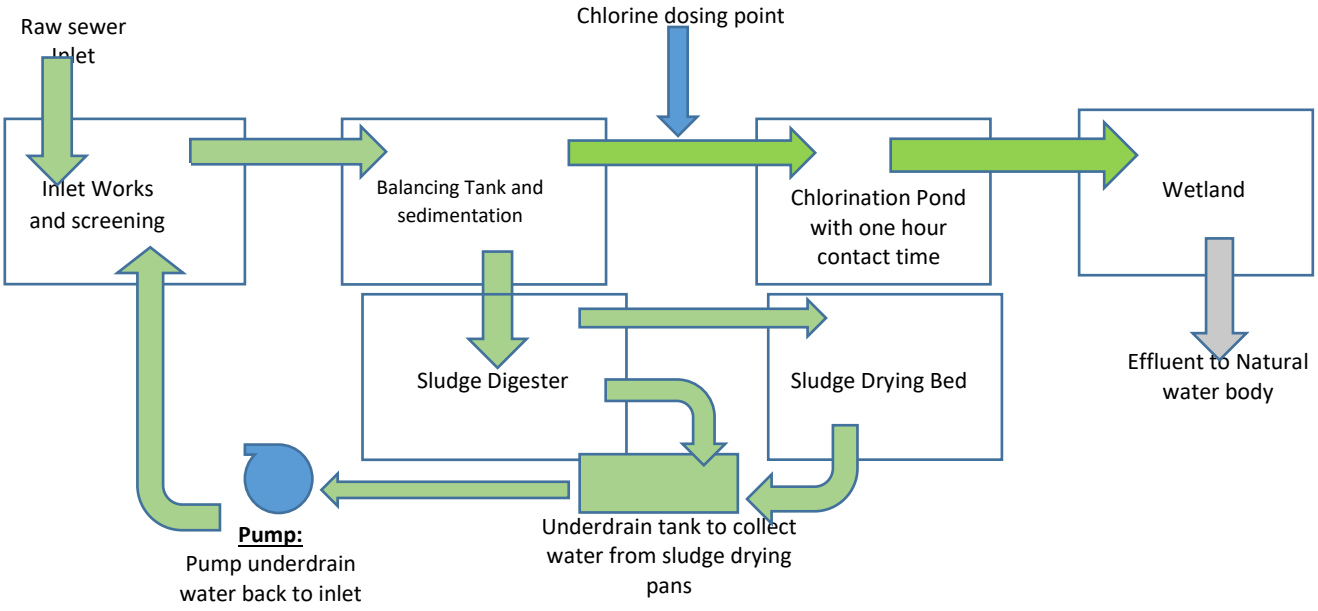

Fig 4.7: Chaka WWTP Layout

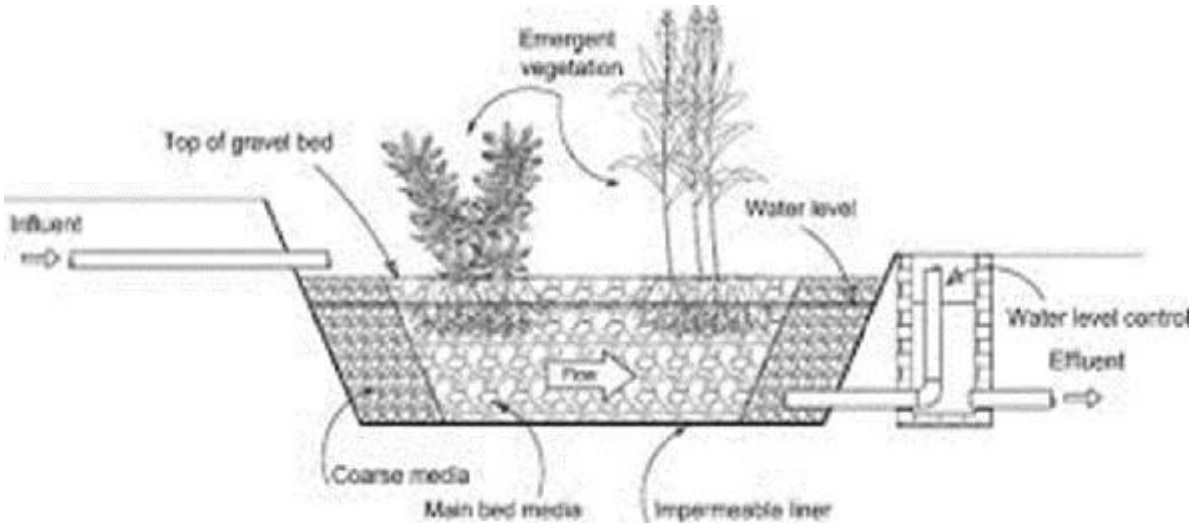

FIG 4.8: TYPICAL WETLAND DESIGN

4.4 Sewerage Project Expansion Cost Estimates

The cost estimates for Kimathi projects are presented in the table below:

Part 1: Kimathi area

The cost estimates for Kimathi projects are presented in the table below:
Part 1: Kimathi area

	DESCRIPTION	TOTAL AMOUNT (Kshs.)
1	Gravity Sewers Total 24,425m. Approximate 12000m are DN400@KES 12260/m, 3691m are DN200 @KES9900/m and 8734m are ND300 @KES10350. Pipe are all SN8.	273,970,460.00
2	Polysynthetic Manhole Cover (@KES 25,000) which can withstand 20 Tons Approx. 800Nr at 30m interval average KES 75,000 each	60,000,000.00
3	Inlet Works to include UFM for influent sewer	5,200,000.00
4	Anaerobic Ponds and grit removal chamber to include air blower	5,500,000.00
5	Primary Sedimentation Tank 2Nr	17,200,000.00
6	High Rate Trickling filters to include filter media (rocks or otherwise)	20,800,000.00
7	Intermediary Sedimentation Tank	8,300,000.00
8	Low Rate Trickling filters	25,800,000.00
9	Final Sedimentation Tank 2nr to include scrappers	18,400,000.00
10	Chlorine contact pond	7,125,000.00
11	Sludge Digester 2 Nr	24,000,000.00
12	Sludge Drying Beds (4no of 25mby 25m each)	24,000,000.00
13	Mechanical Equipment (pumps and screening)	4,500,000.00

14	Double film biogas holder	5,000,000.00
15	100KW Bio gas generation production	5,428,000.00
16	Ultra sonic open channel flow meter for inluent and efflent with solar power supply and recorder 2Nr	1,900,000.00
17	Roads, Footpaths, Parking Areas, Surface Water Drains and Fence	3,500,000.00
18	Administrative Building to include lab not equipped	6,500,000.00
19	Staff Houses (1No Double House type grade 9)	4,200,000.00
20	Wayleave (4m wide 16,000m) and land – 500mby500m) total 76Acres @ 1,500,000)	114,000,000.00
21	Sub- Total 1	635,323,460.00

Part 3: Chaka Sewer

Part 3: Chaka Sewer

	DESCRIPTION	TOTAL AMOUNT (Kshs.)
1	Gravity Sewers Total 11,734m. Approximate 4000m are DN400 @ KES 9260/m, 4000m are DN200 @ KES5900/m and 3734m are ND300 @ KES7350. Pipe are all SN8.	88,084,900.00
2	Sewer pumping station, rising main to include sump	6,026,000.00
3	Land and wayleaves @ 3 acres @1,250,000	3,750,000.00
4	Inlet Works	4,290,000.00
5	Ultra sonic open channel flow meter for inluent and efflent with solar power supply and recorder 2Nr	1,900,000.00
6	Sludge Pumps	3,500,000.00
7	DTF Tank	10,752,000.00
8	Chlorine contact pond	2,125,000.00
9	Sludge Digester	4,825,000.00
10	Sludge Drying Beds	4,225,000.00
11	Wetland	2,825,000.00
12	Mechanical Equipment (pumps and screening)	3,500,000.00
13	Roads, Footpaths, Parking Areas, Surface Water Drains and Fence	2,900,000.00
14	Administrative Building	4,500,000.00
15	Staff Houses (1No Double House type grade 9)	4,200,000.00
16	Sub -Total 3	147,402,900.00

Part 2: Nyaribo Sewer with Gravity Line		
	DESCRIPTION	**TOTAL AMOUNT (Kshs.)**
1	Gravity Sewers Total 16,030m. Approximate 6800m are DN400 @KES 9,260/m (gravity main), 4000m are DN200 @KES 5,900/m and 3734m are ND300 @KES 6,030. Pipe are all SN8.	109,084,020.00
2	Manhole chambers 533Nr @KES 50,000	27,150,000.00
3	Inlet Works and screening	5,200,000.00
4	Sedimentation Tank	14,000,000.00
5	Sludge Pumps	4,500,000.00
6	Ultra sonic open channel flow meter for inluent and efflent with solar power supply and recorder 2Nr	1,900,000.00
7	Sludge Drying Beds (2no of 25mby 25m each) with underdrain pipes slabs at the bottom	4,500,000.00
8	Mechanical Equipment (pumps and screening)	3,500,000.00
9	Roads, Footpaths, Parking Areas, Surface Water Drains and Fence	3,500,000.00
10	Administrative Building	4,500,000.00
11	Staff Houses (1No Double House type grade 9)	4,200,000.00
12	Grid power supply	4,000,000.00
13	Wayleave (4m wide 8,000m) and land – 400mby400m) total 18Acres @ 1,500,000)	27,000,000.00
14	Sub-Total 2	213,034,020.00

Summary of Works

	DESCRIPTION	**TOTAL AMOUNT(Kshs.)**
1	Preliminary and item	275,000,000.00
2	Kimathi and Embassy	635,323,460.00
3	Nyaribo	213,034,020.00
4	Chaka	147,402,900.00
5	Bills Total Exclusive Of VAT (1+2+3)	1,270,760,380.00
6	Add 10% Of For Contingencies (4x10%)	127,076,038.00
7	Bill Total Inclusive Of Contingencies	1,397,836,418.00
8	Value Added Tax (VAT) - 16%	223,653,826.88
9	Grand Total	1,621,490,244.88

4.5 Proposed Process Design

The waste water treatment design will endeavor to cover the following processes before the received effluent is discharged into Muringato River

i. Reception section with screening and initial settlement chambers,
ii. Primary sedimentation/clarifiers to separates sludge from the raw liquid phase of the raw sewage.
iii. The liquid will flow into the trickling filters while the sludge will be pumped into the digesters,
iv. Trickling filters will facilitate biological breakdown of organic content in the sewage
v. Sludge digesters will neutralization of sludge
vi. Secondary sedimentation/clarifiers will further treat effluent discharging from the trickling filters before final discharge,
vii. Sludge drying beds will dry neutralized sludge into an inert cake for easy transportation

Discharge channels will direct treated sewage into River Muringato or nearby blue gum plantation.

4.6 Construction Materials and Installation Materials

Construction materials shall be procured from locally and internationally accepted sources that meet the threshold of public health, occupational safety and health as well as environmental standards. The main construction materials and equipment for this project will be as follows:

i. Sewer pipes will be constructed from PVC pipes
ii. Manholes will be constructed from: In-situ mass concrete and Precast concrete rings, with or without in-situ mass concrete surrounds
iii. Heavy duty manhole covers made from composite material
iv. Mass concrete sewer pipe surrounds
v. Steel steps for manholes
vi. Chain-link fencing and steel gate for the pump station and treatment facilities

4.7 Project Implementation Activities

4.7.1 Activities during Construction Phase

The main activities during the project implementation will include but not limited to the following:

i. Clearing of the vegetation and excavations
ii. Procurement of construction materials from approved dealers
iii. Transportation of construction materials and debris using heavy and light machinery
iv. Appropriate storage of construction materials

v. Preparation of the grounds-this will involve excavation works to create space for laying of sewer pipes
vi. Plumbing works: Includes installation of sewer pipes, connection to existing sewer
vii. Covering of the laid sewer lines and landscaping.
viii. Disposal of the resulting debris/waste materials. All debris and excavated materials will be dumped on approved sites but should be recycled in then project as much as possible e.g. in backfilling.

4.7.2 Activities during Operation Phase

i. The sewer line infrastructure will be repaired and maintained regularly by the proponent during the operational phase of the projects. Activities at operation phase will include:
ii. Carrying out any required repairs
iii. Maintain sewers and ensuring manholes are covered at all times to eradicate potential overflow of sewage from the immediate manholes into open drains
iv. Provide/supply reliable water for flushing the toilets
v. Engaging community groups and leaders in resolving emerging issues
vi. Collection of sewer payments by the proponent through the water bills as the sewer charges

4.7.3 Activities during decommissioning phase

Decommissioning phase is an important aspect of a project cycle which comes at the end of the operation phase of a project. Activities at decommissioning phase of the project will involve excavation and earthworks; transportation of waste materials from site and disposal by registered waste handlers; landscaping and backfilling. The Proponent must ensure that project sites are restored or rehabilitated to acceptable environmental standards.

4.8: Project Alternatives

The probable project alternatives were considered to ensure that the most feasible option of the proposed project was adopted. The project alternatives were compared in regard to their potential environmental and social impacts, capital costs and acceptability by potential beneficiaries. The DeKUT Sewerage project is intended to serve a large scope of the area in Nyeri Sub County for the Dedan Kimathi University and its environments. The area is served by NYEWASCO, and is rapidly growing since the university was established as a fully- fledged University in the year 2012. The neighbouring estates are also set for connection to the sewer with a common treatment plant at the University to be expanded and serve these neighbouring estates which house much of the students. The project is anticipated to greatly improve the environment management in the entire project area and the general environmental conditions shall be improved. The receiving environment will also get

environmental benefits of receiving treated water that does not pose threats to the flora and fauna of the inhabitants.

4.9: The "no project alternative"

This alternative also referred to as "Nil intervention" leaves the status quo of the project area as it is. As a result, the benefits of proper sanitation for the project beneficiaries would not be realized. This would also contribute to stagnation of the regions social economic development since proper sanitation is an indicator of development in an area. Other negative attributes that would not be solved include contamination of the water bodies such as rivers and proliferation of water borne diseases. From the analysis above, the "No Project Alternative" is not the preferred option by neither the Proponent nor the project beneficiaries since the environmental and socio economic benefits of the project would be foregone.

4.10: Alternative Technologies

Based on wastewater characteristics, appropriate technologies have been identified to arrive at the probable combination of treatment technologies in a treatment scheme. A number of parameters were considered before arriving at combination of technologies that are appropriate for treatment of wastewater expected. The approach to provide effluent treatment at low cost is an important factor to be considered and depends on appropriate designs which are diverse in nature and scale of operations. Typically for small scale units, low capital investment, and lower Operations and Maintenance (O&M) costs for treatment are the prime factors. Considering these factors,

(i) Mechanical and chemical processes are more preferable to reduce the suspended solid concentration in effluents before biological treatment. UASB (one of the anaerobic techniques) with less hydraulic retention and less space requirement can be one of the possible options

(ii) To minimize the electrical cost, the possibility of substituting bio-energy should be explored to the extent possible and avoiding a pump station will reduce recurrent expenditure

(iii) Proper management of sludge with its nutritive value would mobilize resources to substitute the operational cost, especially from secondary biological treatment to reduce down-time for maintenance during design of the plant, less manpower with high technical skills would be an added advantage

Other alternatives which can be adopted include continuation and expansion of pit latrines and septic tanks which are in use by the target beneficiaries in urban and pre - urban areas. This will however not provide a better long term solution for proper sanitation since such technologies have limitations for scaling up. Even though pit latrines and septic tanks have less environmental risks during construction in comparison to sewer line connections, during operational phase and O&M activities, cumulatively, they present higher environmental risks and costs.

4.11: Alternative land

Currently, there is no other conceivable, environmentally sound economic activity that the existing DeKUT Sewarage Treatment plant would be put to apart from expanding it to serve a wider area and make the operations more efficient. Land scarcity and high value is also another big challenge in this county.

4.12: Alternative project site

Any other alternative project site would have more negative impacts since the land would have to be cleared and vegetation disturbed. In addition, the proponent would have to contend with other socio-economically undesirable impacts like resettlement and/or compensation.

4.13: Alternative Layouts and Designs

The proponent engaged a technical team who has come up with the most optimal design and layouts. This has taken into consideration the topographic levels since the proposed sewer lines will be connected to an existing sewer network where the topography permits gravity flow.

4.14: The Comparison of Alternatives

Implementation of the proposed sewer extension project would create a more efficient system for collection and disposal of waste water from various targeted estates, alleviate sanitation problems particularly in peri urban areas served by pit latrines and provide employment opportunities to locals during construction and operational phase. Under “No Project Alternative", the above benefits will not be realized. Even though some negative impacts such as noise, soil and water contamination associated with such a development maybe experienced, these negative impacts can be mitigated through various measures proposed in the Environmental and Social Management Plan (ESMP).

CHAPTER FIVE: CONSULTATION AND PUBLIC PARTICIPATION

5.1: Introduction

As a key requirement from Kenya Constitution 2010 and EMCA Act 1999, Public Participation to create awareness and get the support and goodwill of the public is a mandatory exercise. It is in this regard that the ESIA consultant with the help of the proponent and provincial administration grouped the stakeholders so as get objective views from as representative sample of stakeholders as possible before embarking on Consultations and Public Participation.. Tana Water Works Development Agency (TWWDA) in collaboration with Nyeri Water & Sanitation Company Limited (NYEWASCO) undertook Environmental Social Impact Assessment by engaging a consultant to gather stakeholder views on the expansion of the above project to serve the University and the neighboring estates and institutions with sewer line connectivity and sewage treatment plant(s).

The aim of this project is to improve, increase and avail sanitation services to the rapidly growing estates and institutions around DeKUT to avert the health, social and environmental negative impacts associated with untreated wastewater. The goal of ESIA was to maximize the positive impacts that accompany this project as well.

The outcome of this process is meeting minutes of Focused Group Discussions, summary of findings from verbal engagements and filled questionnaires as well as gathering views for the proposed project alternatives to site, design and technologies to be applied in the proposed project. These outcomes were considered for inclusion to the development of Environmental Social Impact Management Plan (ESIMP) as an audit tool for the degree of conformity to NEMA License requirements.

5.2: Stakeholder Mapping and Analysis

During the field investigations, the consultants held discussions and interviews with various stakeholders with the view of gathering their views on various aspects regarding the proposed expansion project and incorporating them in the ESIA report. These stakeholders included:

The stakeholders were grouped as follows:-

Project Proponent: - Tana Water Works Development Authority Board (TWWDA)

Nyeri County Government: - County Executive (Ministry of Environment, Water and Natural Resources)

Public Administration: - Deputy County Commissioner, Nyeri Sub County Chiefs (for Nyaribo,

General public: - Community barazas were done in 3 clusters

Cluster 1: DeKUT Area comprising of the following: Makao Estates, Kahawa Ridge, Embassy area, KIE, Nyeri View, Stephen Mwaniki Estate, Hill Court, Major Seminary, KDF camp, River Side, Kabiruini show grounds. The meeting and filling of the questionnaires was done in DeKUT main campus social hall. The attendance is as

per the attached attendance list, meeting minutes and filled questionnaires attached in the appendix of this report as well as the summary of findings based on comments from meeting participants and responses to the issues raised.

PLATE 5.1: THE CHIEF OPENING THE SESSION

PLATE 5.2: CGN REPRESENTATIVE GIVES HIS

PLATE 5.3: THE PARTICIPANTS GIVING THEIR VIEWS

PLATE 5.4: A YOUTH GIVES HIS VIEWS

PLATE 5.5: AREA MCA HON. MARGRE MUTHONI GIVES HER VIEWS

Cluster 2: Nyaribo Market CPP at the newly constructed Deputy County Commissioner office

PLATE 5.6: AREA CHIEF OPENING THE SESSION

PLATE 5.7: AN ELDERLY LADY PARTICIPATING IN THE DISCUSSION

PLATE 5.8: SECTION OF THE PARTICIPANT

PLATE 5.9: A PARTICIPANT DRIVING A POINT

PLATE 5.10: A PHYSICALLY CHALLENGED LADY PARTICIPANT

Cluster 3: Chaka Township Public Participation at the Chief's Camp grounds

PLATE 5.11: ASSISTANT COUNTY COMMISSIONER OPENING SESSION

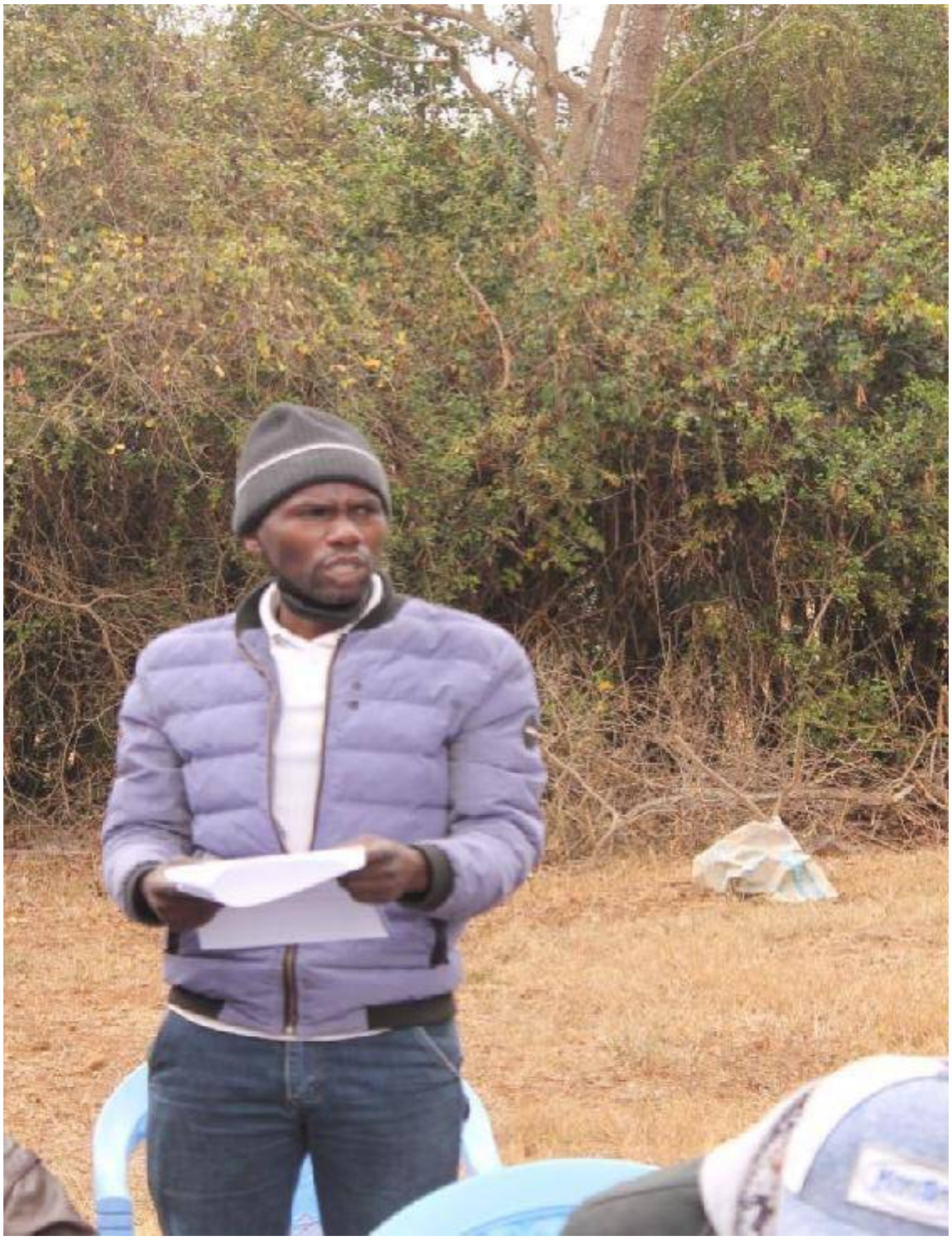

PLATE 5.12: A YOUTH CONTRIBUTING TO THE DISCUSSION

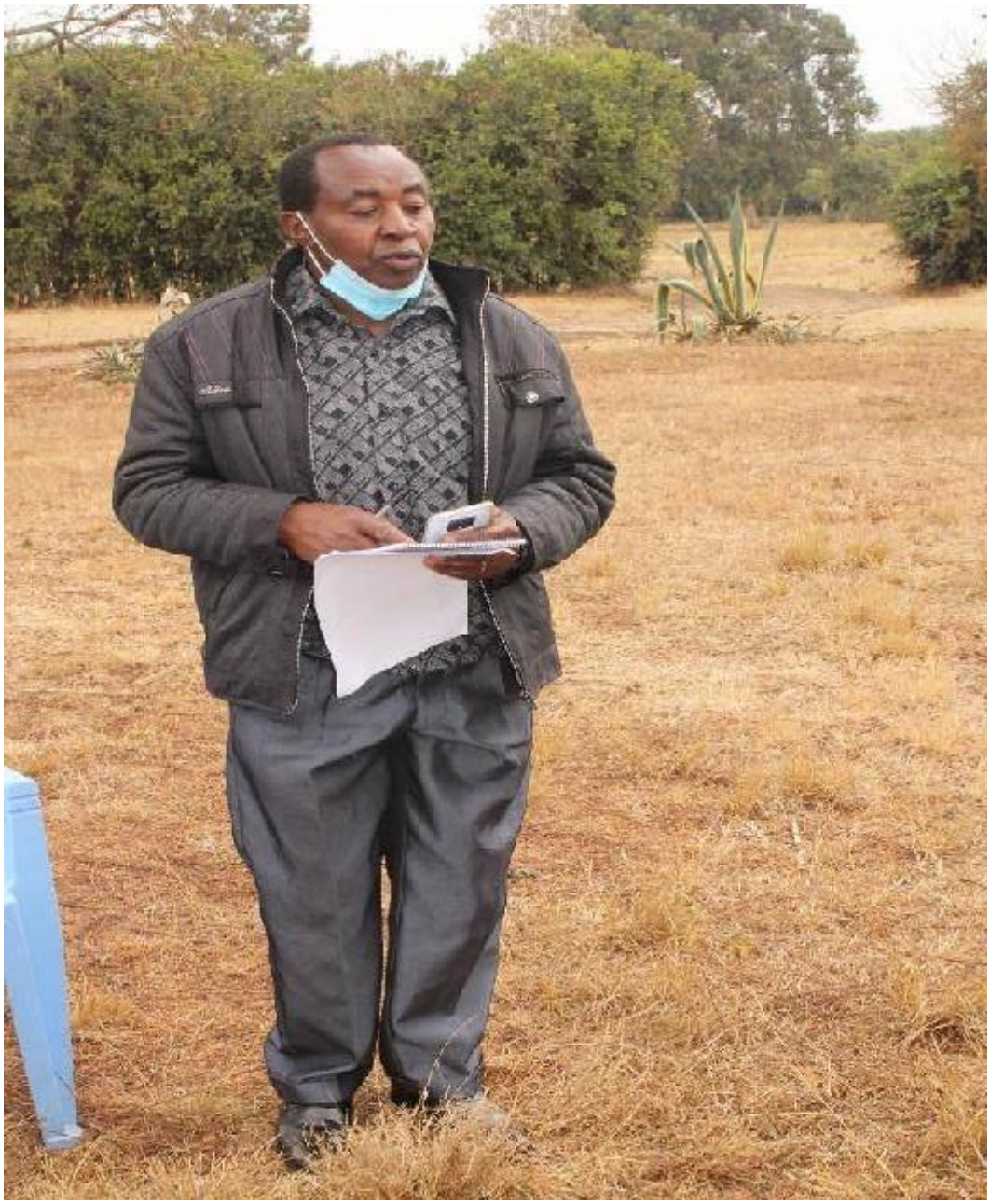

PLATE 5.13: COMMUNITY MEMBERS PARTICIPATING IN THE DISCUSSION

PLATE 5.14: ELDERLY DISABLED PERSON PARTICIPATING

Cluster 1: Dedan Kimathi University Public Participation

PLATE 5.16: ENG. KAMUNYU KAHENYA MAKING OPENING REMARKS

PLATE 5.17: DR. MBURU OF DEKUT ASKING A QUESTION

PLATE 5.18: A SECTION OF THE PARTICIPANTS

PLATE 5.19: A PARTICIPANT LISTENS KEENLY

PLATE 5.20: DR. MBOTE CONTRIBUTING TO DISCUSSION

PLATE 5.21: A PARTICIPANT CONTRIBUTING TO DISCUSSION

Key Ministries and related agencies

A meeting was held with the agencies as a conclusion and an avenue to raise the issues raised and discuss the conflicting comments guided by the institutional mandates and laws and policies in place. A specialized questionnaire was drafted as an outcome from this meeting to seek more comments from institutional views.

i. Tana Water Works Development Authority Board (TWWDA)
ii. Water Resources Authority
iii. Public Health & Sanitation
iv. Lands office
v. KeNHA, KeRRA, County Roads.
vi. Directorate of Occupational Health and Safety (DOSH)

Affected Institutions (Schools and Industrial Institutions)

i. Private Developers.
ii. Property owners
iii. Major seminary
iv. Nyaribo market
v. DeKUT Main Campus
vi. Schools
vii Water Resource Users Authority (WRUA):- Chania River Users Association

5.3: Summary of Findings from Consultation and Public Participation

The stakeholders consulted expressed their support to the proposed sewer extension projects which they felt will result into the following main direct and indirect benefits:

i. Improved economic development in the project areas
ii. Improved state of sanitation and hygiene in the target estates
iii. Reduction in pollution to surface water sources running within the project areas
iv. Increased value of land
v. Enhanced family health with lesser cases of children diseases associated with sanitation problems
vi. Improved aesthetics in the project areas
vii. Employment opportunities

The stakeholders also felt that these negative impacts that could be associated with the project implementation should be mitigated accordingly:

i. Compensation on loss of land use in areas where way leave will be required from private land particularly in Nyaribo,Chaka and Embassy areas
ii. Overflow or Leakage of sewer to the environment in case of blockages causing bad odor to neighboring communities
iii. Dust emissions from project vehicles

Employment opportunities should be considered and 70% of jobs should go to the youth. Hand tools should be engaged more than heavy machines

5.4: Specific Concerns from various Stakeholders

i. Institutional representatives convened by Tana Water Services Board emphasized that the Proponent should ensure they meet the standards of waste water stipulated in Waste Regulations to ensure that treated sewage does not pollute Chania River
ii. NYEWASCO to ensure that all their industrial customers have a pre-treatment plant for treating their industrial waste prior to disposal through the main sewer system
iii. The Deputy County Commissioner expressed his support for the proposed sewer extension project and felt that the development would indirectly contributes towards the areas economic growth. He appreciated that the proposed sewer extension projects will create more employment opportunities to the local communities
iv. The County Environment office urged NYEWASCO to ensure that during project implementation, all environmental requirements as stipulated in the laws are adhered to.
v. The Water Quality Regulations which provides for the protection of lakes, rivers, streams, springs, wells, and other water sources

vi. The Waste Management Regulations which sets out standards for handling, transportation and disposal of various types of wastes

vii. The Noise and Excessive Vibrations Regulations

CHAPTER SIX: ANTICIPATED IMPACTS AND MITIGATION MEASURE

6.1 Introduction

The EIA team noted positive and negative impacts from installation, operationalization and possible decommissioning of the DeKUT Sewerage Treatment Plant in ecological and socio-economic dimensions. The overall aim of the project is improved sanitation in DeKUT and its surrounding environment to ensure sustainable growth of the proposed project area. This will be done by ensuring an environmentally friendly development to minimize negative effects that may endanger the lives of the students, staff or the surrounding environment or maximize the potential positive impacts.

The activities that are likely to lead to significant environmental impacts will be improvement of the existing WWTP treatment plant by introduction a course and fine screens structures, sludge separation and drying the sludge for organic farming and finally polish the water through two series facultative and two maturation ponds. decommissioning of the current DeKUT WWTP and construct new intake works, double mechanized sedimentation tanks, double trickling filter and final disinfection of water ready for discharge to natural water course. The other activities will emanate from installation of equipment, the handling of the chemicals especially chlorine and odor from accumulated waste water. Appropriate mitigation measures will be discussed and an elaborate ESMP outlined.

6.2 Anticipated Impacts from Waste Water Treatment Plant

Positive Environmental Impacts

i. The quality of surface and ground water under the optimal proposed waste water treatment plant will not be negatively affected and discharges of the treated water will be useful to the recipient environment
ii. The residents of the area will experience net positive environmental benefits from the project.
iii. The public health of the community will be upgraded due to improved standard of wastewater management
iv. Income opportunities will be created for local people during the construction and operational phases.

Negative impacts during operation phase of the treatment plant

i. The plant may also not be able to perform effectively if it is not well maintained and operated optimally
ii. Haphazard dumping of accumulated sludge from the digesters might create contamination of local water resources and the soils
iii. If sludge drying is not done during the dry season, there is the possibility that part of the sludge may be driven with the runoff, which can result in the contamination of surface water resources within the vicinity of the project site

6.3 Possible Mitigation Measures

Measures will be taken to:-

i. Test wastewater quality on a regular basis to ensure that its characteristics are within the set standard as per third schedule of Water Quality Regulations 2006

ii. Take measures to avoid accidental surface runoff intrusion from the manholes of the sewerage network,

iii. Proper handling and drying of sludge will be done in drying beds, during dry season.

iv. With continuous sampling and laboratory tests, the performance of the WWTP will be optimized

v. The removed greasy material from the grease and sand trap if not properly stored and managed on regular basis can cause odors.

vi. The staff of the plant will be properly trained, to enable them to handle grease and sand removal and taking samples for lab testing

vii. Produced residuals will be stored in closed containers and transported in enclosed container trucks to landfill site.

viii. Aeration tanks will always be kept at an optimum aeration rate

ix. Odors will be reduced or prevented through normal housekeeping and improved operation and maintenance design procedures.

x. Sludge transfer systems such as conveyors, screw pumps, and conduits will be kept clean in order not to generate odors.

xi. Regular cleaning of aeration tank walls and floors, washing weirs, and removing scum regularly, will be done to help in odor reduction.

xii. Flow regulating chambers, drainage valves, standby pumps, as well as electric standby generators shall be provided to reduce the possibility of wastewater flooding within the wastewater treatment plant site, which results in possible generation of obnoxious smell

6.4 Phase Impacts and their Mitigation Measures

6.4.1 Construction Phase Impacts of DeKUT Sewerage Project and Mitigation

Anticipated Impacts	**Mitigation Measures**
Impact of sourcing of materials and equipment on environment	Obtain equipment and materials from sources that are compliant with NEMA Regulations. Procure quantities that are sufficient for the intended works only. Re-use as far as practical to stem waste accumulation.

Anticipated Impacts	Mitigation Measures
	Commit to extensive use of recycled raw materials where appropriate and in a manner that does not compromise the safety of the WWTP. Register the site as a workplace with the Directorate of Occupational Health and Safety (DOHS). Employees using equipment that produce peak sounds shall be provided with earmuffs Comply with the provisions of Noise Regulations (Legal Notice No. 61 of 2009)

6.4.2 Operational Phase Impacts of DeKUT Sewerage Project and Mitigation

Anticipated Impacts	Mitigation Measures
Solid waste	Contract a private waste handler who is registered with both NEMA and the County Government of Nyeri and keep proper records for collection and disposal. Manage waste through the hierarchy of options that including reduction at source, separation of wastes to make it easier to undertake recycling / reusing. Create awareness among workforce and visitors on the importance of proper disposal of solid wastes. Generally solid wastes will be managed in line with Legal Notice No. 121 of 2006
Increased water demand	Ensure sources of water for use meets the standards specified under schedule I of Legal Notice No. 120 of 2006 (standards for domestic supply) Install self-regulating water taps for sinks and basins for workers Create awareness among staff on the importance of conservation of water resources

Anticipated Impacts	**Mitigation Measures**
Possible fire hazards	Prepare and implement a Fire Hazard Response Plan Use of retardant material in installation works of the laboratory Only qualified personnel (electrical engineers) to install electrical systems for the plant Engineering standards shall meet provisions for adequate and safe wiring; plumbing, heating, and cooling systems will also be in conformity with acceptable building codes Install fire alarm detection and notification systems i.e. install smoke and heat detectors or manually activated pull station. Install fire Suppression Systems such as Sprinkler system, hose reels, Dry risers (hydrants) and portable fire extinguishers Prominently display guidelines on what guests, visitors and staff should do in the event of a fire Undertake bi-annual fire audits County Government of Nyeri to issue a fire safety certificate
Climate change	Prepare and implement Contingency Plans for Phenomena associated with climate change such as flooding as provided for in the engineering designs of the development
Medical emergencies	Have well trained first aid personnel on site at all times during installation, operationalization and decommissioning Have an adequately equipped first aid kits within the facility at all times Have contact numbers of reliable health facilities and professional health practitioners
Effluent from Grey water recycling plant	Treat to ensure effluent to be released is in compliance with the water quality regulations 2006

Anticipated Impacts	**Mitigation Measures**
Potential leakage or spillage of wastewater from treatment plant	Wastewater treatment plant will be fabricated with high quality materials Sludge drying beds will be paved to prevent infiltration
Possible overflow of untreated or semi-treated wastewater	Multiple aeration basins will be installed in the plant to manage overflowing problems Drains and bypasses shall be designed for emergency cases A standby power source (e.g. generator) should be available to power the pumps during power failures A standby pump/s should be in place in the event of failure of the primary pumps
Possible pollution of streams or groundwater	A water quality monitoring programme must be in place to detect any contamination that may be linked with the treatment plant Immediately institute appropriate mitigation measures if contamination is discovered A groundwater quality monitoring programme will be in place to detect any contamination that may be linked with the treatment plant Immediately institute appropriate mitigation measures if contamination is discovered
Possibly exceeding General Authorisation thresholds (Water Quality Regulations 2006)	Treatment of wastewater must take place strictly according to the engineers' prescriptions in order to meet wastewater quality standards as set by Water Quality Regulations 2006, and treated wastewater must be monitored on a regular basis to verify quality Wastewater discharge testing must be accurate and reliable
Possibly exceeding General Authorisation thresholds (Water Quality Regulations	Treatment of wastewater must take place strictly according to the engineers' prescriptions in order to meet wastewater quality standards as set by Water Quality Regulations 2006, and treated wastewater must be monitored on a regular basis to verify quality

Anticipated Impacts	**Mitigation Measures**
2006)	Wastewater discharge testing must be accurate and reliable
Inadequate management if site operator is ill / on leave or resigns	At least two site operators must be fully trained in the operation of the site, so that one can stand in for the other in case of illness, leave, etc.
Lack of skills on the part of the plant operator	Plant operators will be appropriately skilled and experienced for the task at hand Site operator/s to receive continuous training in all aspects of daily management of the plant (technical or administrative) Technical support must be available to the sewage plant operator
Irregular or Inadequate maintenance could compromise functionality	Regular checking of key components of the system to verify continuing functionality Regular replacement of key components as a preventative measure, even if components still appear to be functional Ensure monitoring systems and gauges are in good working order at all times in order to facilitate informed management of the treatment system. A maintenance plan must be in place to ensure that planning, such as budget allocation or procurement of service providers, can be put into motion sufficiently ahead of time. Maintenance plan will take into account the lead times applicable to certain types of maintenance, e.g. long delivery times for certain components of the system.
Release of unpleasant odours associated with raw sewage and sludge, caused by methane and hydrogen sulphide emissions from the sewage	Ensure that all components of the treatment plant are in good working order at all times. If the plant is functioning properly, the generation of odours should be minimized.

Minimization of Health, Safety and Fire risks	Implement all necessary measures to ensure health and safety of the workers and the general public during operation of the project as stipulated in OSHA, 2007 train all workers of the facility on fire safety procedures Ensure all fire safety equipment are inspected regularly Conduct Occupational Health and Safety, Fire and risk assessment audits annually Register the facility as a workplace by DOSH

6.4.3 Decommissioning Phase Impacts and Mitigation

Legislative compliance	Give adequate notice to the staff / stakeholders. Engage the services of legal experts Undertake due diligence environmental audit for the decommissioning and submit to NEMA at least 3 months prior to decommissioning for approval Obtain demolition permit from the County Government of Nairobi.
Demolition waste	Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3.Composting and reuse 4. Incineration 5. Sanitary Land filling. All laboratory equipment, set up structures and any other accessories within the Lab premises that will not be used for other purposes shall be removed and recycled/reused as far as possible All structures will be removed and recycled, reused or disposed of at a licensed disposal site as per the guidelines of WHO on Biosafety Level 3 laboratories and NEMA guidelines and as per manufacturer's instructions and toxicity levels Where recycling/reuse is not possible, the materials should be taken to a licensed waste disposal site by a NEMA licensed waste handler. Donate reusable demolition waste to charitable organizations, individuals and institutions with similar undertakings

6.5 Occupational Health and Safety

6.5.1 Safety of workers During Installation and Operationalization

The levels of implementation of occupational health and safety considerations at the workplace shall begin with the deliberate effort by the contractor and the proponents to protect the employees at the modification and installation site. In this regard the following recommendations shall be adhered to:

i. Registration of the proposed Wastewater Treatment plant as a workplace with the Directorate of Occupational Health and Safety (DOHS)

ii. Provision of appropriate and adequate Personal Protective Equipment (PPE) to employees.

iii. Enforcement and proper use of PPE by all workers.

iv. Provision of appropriate tools, equipment and machinery in sound working conditions to workers to avoid accidents.

v. Development of a clear policy on treatment of injured personnel.

vi. Provide insurance cover to workers on site.

6.5.2 Safety of visitors, neighbors and general public

The proponents and the contractor will have the obligation to put in place measures that will protect visitors to the site, neighbors, and the general public in the following ways

i. Informing neighbors in writing on the commencement of the project at least two weeks in advance

ii. Providing visitors to the project site with protective clothing at all times

iii. Restricting access to the site by the public through signage

iv. Providing security services during installation and operationalization of the facility.

v. Placing notices and safety slogans at strategic points (entry of the site and around the containment walls) to inform and educate neighbors and the general public of ongoing works and safety requirements

6.5.3 Tools, Equipment, Machinery Use and Electrical Safety

During installation, it is expected that different machines, tools and equipment of different specialties will be used. Most of this equipment will be powered internally by use of electricity or diesel. In regard to electrical safety, the following will have to be undertaken:

i. Installation and fitting of proper electrical system to enable supply of electrical energy to utility point

ii. All electrical installations and fittings should be done according to electrical safety rules.

iii. All electrical wires must be safely insulated.

iv. Sockets and other electrical outlets must be securely fitted.

v. When not in use, all machines should be put off.

vi. Qualified and experienced electrician should be hired to carry out all electrical works in the building

vii. Safety slogans should be strategically posted as a reminder to employees.

viii. All machine operating manuals should be clearly archived and availed for use when needed.

ix. Each machine operator should be conversant with the use of machine operating manuals.

6.5.4 First aid

The following should be adhered to;

i. Setting up of an appropriately equipped first aid station that is easily accessible at the site

ii. Provision of first-aid services to all employees at all times

iii. There shall be a well-trained first aider on site at all times during installation and operationalization

iv. An eye-wash station and/or emergency shower shall be provided where the recommended first aid response is immediate flushing with water,

v. The first aid station shall be equipped with gloves, gowns and masks for protection against direct contact with blood and other body fluids,

vi. A written emergency response plan will be in place and drills conducted to familiarize employees.

6.5.5 Fire prevention and response plan

Fire outbreaks whether small or large can be detrimental to the project and in some instances be life threatening. It is therefore important to consider its likelihood and the circumstances surrounding its propagation. The proponents will therefore develop a Fire Prevention Response Plan aimed at addressing the awareness and the mechanism necessary for its response.

Purpose of plan

The purpose of the Fire Prevention and Response plan for the proposed project is to:

i. Increase awareness among guests, management and others of the need for a fire prevention and response plan,

ii. To establish the coordinating mechanisms necessary for management to prepare and implement measures to safeguard property and lives of all concerned should a fire occur in a building

iii. Indicate all possible evacuation routes for each accommodation unit, restaurants, bars etc and other buildings on the property.

Fire prevention

Fire prevention will be achieved through:

i. Use of retardant material.

ii. Use of qualified personnel to install electrical systems for the project.

iii. Ensuring engineering standards to meet provisions for adequate and safe wiring, plumbing, heating, and cooling systems.

Fire protection equipment/systems

The proponents will install fire protection systems to protect lives and property. The following are fire detection, notification and suppression systems that will be used to control a fire:

i. Fire alarm detection and notification systems*:* - Install smoke and heat detectors or manually activated pull station.

ii. Fire Suppression Systems: - Hydrants and Fire Extinguishers. The proponents will install multi-purpose dry chemical (Class ABC) fire extinguishers. Dry chemical extinguishers will range in sizes of 2.5 to 5 Kgs and will be installed at strategic places.

Fire Response

Fire outbreaks are unpredictable but can be prevented. It is difficult to portray a response plan for the project site considering the different scenarios that might arise from a fire. It is important though, to have in mind certain tips and guidelines as to the advent of a fire. These guidelines may come in the form of a fire combating plan whereby trained staff may utilize the different fire controls to extinguish the fire. Fire outbreaks often require an evacuation plan and for this reason, a comprehensive evacuation plan will be required to be developed.

6.5.6 Disaster management plan

i. The proponents and Lab staff to formulate an Emergency Committee to address the aforementioned Disaster Management Plan.

ii. The committee will be charged with the task of electing an Emergency Coordinator and his/her subordinate, who shall direct and execute all the activities outlined by the response plans.

iii. The emergency committee must conduct periodic meetings to address important issues concerning the disaster management plans.

Such important issues should be the objectives of the committee, their roles and responsibilities, updates, training, drills as well as their terms of reference (TOR) which they will abide by.

CHAPTER SEVEN: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 Introduction

The key outcome of the Environmental and Social Impact Assessment (ESIA) process for the proposed Expansion of DeKUT Sewerage project and specifically the Wastewater Treatment Plant is the Environmental Management Plan (EMP). In real meaning, the EMP is a mechanism to meet the recommended environmental and social mitigation measures. This EMP is an instrument that will allow TWWDA and other key stakeholders to integrate environmental components during implementation, operation and decommissioning phases of the project.

7.2 Scope and Objectives of the EMP

This Environmental Management Plan focuses on mitigating the impacts identified during the environmental assessment. It is an instrument that will allow TWWDA and other key stakeholders to integrate environmental components during the various phases of the project. This plan is meant to establish measures and procedures to control the identified impacts and monitor their progress. It will achieve the following in the long run:

(i) Provide the National Environment Management Authority (NEMA) with a tool to make ease the evaluation of the objectives at different phases of the project, taking into account the Kenyan environmental legislation;

(ii) Provide clear and mandatory instructions to the proponent and other key stakeholders with regard to their environmental responsibilities in all phases of project.

(iii) Ensure continuous compliance of TWWDA, NYEWASCO and other key stakeholders with Kenyan legislation and policies regarding the environment;

(iv) Assure the regulators and interested and affected parties the satisfaction of their demands in relation to environmental and social performance.

7.3 Plan Period

The EMP provided is for the installation phase, operations and lastly the decommissioning of the project. It is expected that an Environmental Audit will be undertaken at the end of the first year of operation to evaluate conformity to the EMP as well as identify any gaps and recommend corrective adjustments to the plan. This will then be addressed through a loop mechanism from installation to operational phase to identify the success of the project versus the failures. This should be analyzed through the environmental management criteria of impact and mitigation.

7.4 Principles of Environmental Management Plan

The project should be implemented taking into account the need to minimize potential negative impacts and maximize its potential positive impacts on the biophysical and socio-economic environment as well as health and safety of workers and the public .This commitment must be made at various levels, from the senior management level of the proponent to the levels of all parties involved in the implementation of the project

7.5 Commitments of the ESIA

The ESIA is a complex document containing a series of recommendations related to mitigation measures, monitoring and management. A key role of the EMP is to put them all in a single framework. For each identified impact in the ESIA, the EMP provides in a tabular format the following:

i. A list of mitigation measures (activities) that TWWDA, NYEWASCO and other key stakeholders will implement in accordance with each phase and activity of the project, to ensure that the mitigation objectives are met in full;
ii. The role and responsibility of each of the stakeholders to ensure full implementation of mitigation measures; and
iii. The timetable of implementation/monitoring activities.

7.5 Environmental Awareness

The proponent will be sensitive to the needs of the environment so as not to degrade (or degrade to a minimum) the existing environmental conditions. It is the proponent's primary responsibility to ensure that all parties directly involved in the construction and operation phases of the project, including managers and employees are aware about the need to prevent or minimize environmental degradation. The awareness activities should be guided by the following issues:

i. Prevention of pollution of surface water and groundwater;
ii. Prevention of air quality degradation;
iii. Prevention of increased noise levels;
iv. Prevention/reduction of social and economic disruptions;
v. Prevention of risks to health and safety of workers and the general public.

7.6 Mitigation

All activities related to the lifecycle of the project will be subjected to appropriate mitigation measures to ensure that negative impacts are properly mitigated and managed. Mitigation involves identifying the best options to be adopted to minimize or eliminate negative impacts, highlighting the benefits associated with the proposed project and the protection of public and individual rights. Practical measures are therefore sought to reduce adverse impacts or enhance beneficial impacts of the project.

7.7 Monitoring

The key objectives of monitoring are:

i. To ensure that the EMP is implemented;
ii. To evaluate the effectiveness of the mitigation measures;
iii. To verify predicted impacts;
iv. To provide feedback to licensing authorities.

7.8 Responsibility of TWWDA

The proponent (TWWDA) will ensure that all project operations are conducted in accordance with their internal environmental policies and in accordance with the EMP. TWWDA in partnership with the contractor and other key stakeholders will ensure that the EMP and other requirements related to health, safety and environment are implemented in full. TWWDA should strive to manage operations in a manner to protect the environment and health and safety of employees, contractors, consumers and the general public. To achieve this objective, TWWDA will:

a. Obtain authorizations/approvals/licenses required for project implementation;
b. Request the contractor to operate on the basis of valid authorizations/approvals/ licenses for the activities to be implemented;
c. Ensure that the EMP is an integral part of the contract document with the Contractor and that the contractor will be responsible for its implementation;
d. Establish institutional linkages with relevant parties in the project implementation as needed, or designate a representative for that purpose;
e. Ensure that the various project activities comply with the mitigation measures proposed in the Environmental Management and Monitoring Program (EMP);
f. Ensure that there are contingency plans and resources for employees' health and contingency plans to respond to accidents at work (Emergency Response Plan);
g. Make regular inspections to all the different activities with regard to social aspects, health, safety and environment and check for any non-conformity with the EMP attributable to the Contractor and identify the steps taken for its correction;
h. Produce reports that allow to monitor and evaluate the performance of operations following the measures and objectives of the ESIA and EMP in relation to health, safety and environmental protection;
i. Monitor the performance of their own teams, or designate a representative to that effect;
j. Approve work procedures established for each phase of the project and ensure that the various proposed activities are implemented in accordance with them;
k. Establish and implement a complaints management procedure that allows treatment/appropriate response to them;
l. Create awareness among workers about environment, health and safety issues; and

m. Ensure that any corrective activities recommended by the audits or inspections (performed internally or externally) are implemented within the time pre-set.

If the activities of this project are awarded to contractors or subcontractors to act on behalf of the proponent, the responsibilities indicated here as of the proponent's move to these companies. From an environmental point of view, the primary responsibility over the continued operations belongs to the proponent. It is recommended therefore that where there are jobs awarded to contractors, be appointed a Clerk of Work/Supervisor, which will verify its performance.

7.9 Responsibility of Contractors

All Contractors should identify individuals responsible for overall management of the environment, social management, safety and health management during all operations. The Contractor shall be responsible for relevant training of its staff, which must be able to complete the project activities in an efficient and appropriate manner in accordance with the contractual requirements of TWWDA to the agreed work. Among many tasks, the contractor shall:

i. Prepare its own EMP implementation plan as well as a health and safety plan within 30 days of signing of the contract. The EMP implementation plan must be submitted to the Resident Engineer for onward transmission to TWWDA for approval prior to the initiation of construction works;
ii. Submit to the proponent the work procedures/methods or equivalent documents for approval;
iii. Operate on the basis of valid licenses/approvals/authorizations for the activities to be implemented by them;
iv. Employ techniques, practices and construction methods to ensure compliance with the EMP;
v. Prevent or minimize the occurrence of accidents which might cause damage to the environment and be able to respond positively to an accident if it occurs;
vi. Meet the working procedures and environmental requirements and health and safety established by contract with the Proponent; ensure compliance with them by sub-contractors who might be hired by him;
vii. Minimize environmental damage, waste control, avoid pollution, prevent loss or damage on natural resources and minimize the effects on the users and occupants of surrounding lands and the public;
viii. Provide Personal Protective Equipment (PPE) to workers which is appropriate to the tasks to be performed and ensure that it is used;
ix. Implement all corrective activities agreed in audit (internal or performed by other agencies) or inspections, within the pre- established deadline;
x. Manage the complaints process on the elements that fall within its jurisdiction, or refer complaints to the Proponent, so that they can receive treatment/appropriate response;

xi. Prepare a rehabilitation plan which shall include preliminary designs on the temporary and permanent landscaping plan during both the construction and post-construction and operation period (where applicable).

7.10 Responsibilities of Regulatory Agencies

Regulatory agencies directly involved in this project include among others Water Resources Authority (WRA) and National Environment Management Authority (NEMA)

Water Resources Authority (WRA)

Water Resource Authority (WRA) is a state corporation under the Ministry of Environment and Natural Resources established under the Water Act 2002 and charged with being the lead agency in water resources management. The Authority through Regional offices in Murangá for Tana basin will carry out the following mandates under this EMP:

a. Monitor and enforce conditions attached to water permits and water use;
b. Regulate and protect water resources quality from adverse impacts;
c. Regulate and protect water resources from adverse impacts;
d. Regulate water infrastructure, use and effluent discharge;
e. Work with the beneficiary communities to manage and protect water catchments;
f. Establish water resources monitoring networks

National Environment Management Authority (NEMA)

NEMA is the institution that plays a greater role in the process since it is responsible for taking decision on the ESIA process and responsible for regulating the environmental performance of projects in Kenya. They are also responsible for verification, inspection and audit, before, during and after the implementation of projects (in accordance with EMCA 1999, amended 2015). NEMA should therefore ensure that project activities comply with applicable environmental laws and regulations.

7.11 EMP Outline

The tables below outline the environmental management plans (installation, operation and decommissioning) for the proposed expansion of DeKUT Sewerage Project. The plan considers the following:

i. Predicted environmental impact
ii. Proposed mitigation measures
iii. Responsible party / parties
iv. Timeframe
v. Costs

7.11 EMP for the Construction and Installation Phase

Anticipated Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Approx. Cost (KShs.)
Vegetation loss due to site clearance	The clearance of the site for construction purposes shall be kept within site alignment areas i. The extent of clearing within the work areas should be clearly marked ii. Rehabilitate all disturbed areas through re- vegetation iii. Instruct all construction workers to restrict clearing to the marked areas and not to work outside defined work areas	Contractor	Construction and installation	See project badget
Trench Excavation	Earthworks should be restricted to construction sites as far as practical i. Earthworks should be carried out during the dry season to prevent soil from being washed away by rain ii. Excavated materials should be kept at appropriate sites iv. Protect areas susceptible to erosion using temporary and permanent drainage structures	Contractor	Construction and installation	See project badget

Hazard to individuals arising from open trenches	v. Install warning signs and lightings at both deep and shallow trenches. vi. Backfill trenches as soon as works are completed vii. Provide temporary bridges and protection rails at deep trenches to facilitate people's movement	Contractor	Construction and installation	2,500,000.00
Heath hazards arising from dumping of waste material, broken pipes and excavated materials	Landscape the area to blend with the surrounding area; re-vegetate the area i. Dispose of waste materials at designated sites and in manner approved by the local council	Contractor	Construction and installation	200,000.00
Soil, surface and ground water contamination	Construct oil-water interceptors or sumps to capture discharge of oils, fuels and other polluting liquids i. A safety and emergency response plan to be developed for all operations with emphasis on the protection of the environment ii. Surface runoff should be controlled by temporarily berming the outlet of the significant storm water features to provide some detention behind the berms	Contractor	Construction and installation	50,000.00

Vehicular gaseous/dust Emissions which pollute air causing respiratory problems (SO,CO, N2O, and greenhouse gases)	Maintaining machineries at manufacturers specifications i. Site roads should be dampened every 4-6 hours or within reasonable time to prevent dust nuisance and on hotter days, this frequency should be increased. ii. Cover or wet construction materials such as sand to prevent dust nuisance. iii. Where unavoidable, construction workers working in dusty areas should be provided and fitted with N95 respirators. iv. Wetting of unpaved areas and the entire work place v. Limit removal of vegetation and a rehabilitation programme on site and associated infrastructure following construction	Contractor	Construction and installation	
Noise pollution and vibrations which are nuisance and may cause health complications	Use of equipment that has low noise emissions by exposed workers as stated by the manufacturers. i. Use of equipment that is properly fitted with noise reduction devices such as mufflers. ii. Construction workers operating equipment that generates noise should be equipped with noise protection. A guide is a worker operating equipment generating noise of 80 dBA (decibels) continuously for 8 hours or more should use earmuffs. Workers	Contrator	Construction and installation, operations and decommissioning	250,000.00

	experiencing prolonged noise levels 70 - 80 dBA should wear earplugs. iii. Operate noise-generating equipment during regular working hours (e.g. 7am – 6 pm) so as to reduce the potential of creating a noise nuisance during the night. iv The movement of equipment (trucks) during the construction of the WWTP should be limited to the working hours, 8:00 am - 4:30 pm a day.			
Impact on environmental health and safety of the workers	Ensure workers health and safety through awareness campaign and provision of appropriate PPE Rehabilitate excavated sites as soon as construction is complete provision of adequate sanitary facilities Training of all workers in Safety Health and Environment (SHE)	Contractor	Construction and installation, operations and decommissioning	200,000.00
Inability to oversee execution of ESMP due to low capacity	Train the relevant staff of the proponent on monitoring skills and implementation of findings to enhance effectiveness of ESMP Provide tools for monitoring effectiveness of ESMP	Proponent and Contractor	Operational period	100,000.00

Impact of sourcing of materials and equipment on environment	❖ Obtain equipment and materials from sources that are compliant with NEMA Regulations. ❖ Procure quantities that are sufficient for the intended works only. ❖ Re-use as far as practical to stem waste accumulation. ❖ Commit to extensive use of recycled raw materials where appropriate and in a manner that does not compromise the safety of the laboratory. ❖ Register the site as a workplace with the Directorate of Occupational Health and Safety (DOSH). ❖ Employees using equipment that produce peak sounds shall be provided with earmuffs ❖ Comply with the provisions of Noise Regulations (Legal Notice No. 61 of 2009)	Proponents and Contractor	Throughout installation and operationalization period	No cost

7.12 Environmental and Social Management Plan during operation period

Anticipated Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Approx. Cost (KShs)
Solid waste	❖ Cover screening wastes and grit chamber wastes to prevent mixing with surface run off or rain water . ❖ Contract a private waste handler who is registered with both NEMA and the County Government of Nyeri and proper records kept for collection and disposal. ❖ Manage waste through the hierarchy of options that including reduction at source, separation of wastes to make it easier to undertake recycling / reusing. ❖ Create awareness among workforce and visitors on the importance of proper disposal of solid wastes. ❖ Cover the wastes from grit chambers or screens to prevent contamination of surface run off ❖ Generally solid wastes will be managed in line with Legal Notice No. 121 of 2006	Proponents, contractor and project manager.	Throughout operational phase	100,000.00
Possible fire hazards	❖ Prepare and implement a Fire Hazard Response Plan ❖ Label all inflammable materials and store them appropriately	Proponents, Management Staff,	Throughout operational phase of the project cycle	10,000.00

Anticipated Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Approx. Cost (KShs)
	❖ Provision of adequate firefighting equipment capable of fighting all classes of fire ❖ Put "No Smoking Signs" in areas where inflammables are stored ❖ Use of retardant material in installation works of WWTP ❖ Only qualified personnel (electrical engineers) to install electrical systems for the plant ❖ Install fire alarm detection and notification systems i.e. install smoke and heat detectors or manually activated pull station. ❖ Install fire Suppression Systems such as Sprinkler system, hose reels, Dry risers (hydrants) and portable fire extinguishers ❖ Prominently display guidelines on what guests, visitors and staff should do in the event of a fire ❖ Undertake bi-annual fire audits ❖ County Government of Nyeri to issue a fire safety certificate	Visitors, Fire auditors and County government of Nyeri		
Potential leakage or spillage of wastewater from treatment plant	Wastewater treatment plant will be fabricated with high quality materials Sludge drying beds will be paved to prevent infiltration	Onsite plant manager	Operational period	

Anticipated Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Approx. Cost (KShs)
	Daily visual inspection of plant for signs of leakage or particular greening of grass in certain areas, which may be indicative of leakage			
Possible overflow of untreated or semi-treated wastewater	Multiple aeration basins will be installed in the plant to manage overflowing problems Drains and bypasses shall be designed for emergency cases. Daily visual inspection to determine whether emergency systems are working at their optimum levels and whether there is any overflow A standby power source (e.g. generator) should be available to power the pumps during power failures A standby pump/s should be in place in the event of failure of the primary pumps Monthly testing of generator to determine if it is still in working order and whether fuel is available. Monthly testing of standby pump to determine if it is still in working order	Onsite plant manager	Operational period	

Anticipated Negative Impacts	**Recommended Mitigation Measures**	**Responsible Party**	**Time Frame**	**Approx. Cost (KShs)**
Possible pollution of streams or groundwater	Monitor water quality in the adjacent Muringato River and implement mitigation measures if necessary A water quality monitoring programme must be in place to detect any contamination that may be linked with the treatment plant Six-monthly water quality testing at two points in the Muringato River directly upstream and directly downstream of the sewage plant	TWWDA or designated service provider	Operational period	
Impacts on groundwater quality	A groundwater quality monitoring programme must be in place to detect any contamination that may be linked with the treatment plant Six-monthly groundwater quality testing at two boreholes: directly upslope and directly down slope of the sewage plant	TWWDA or designated service provider	Operational period	

Possibly exceeding General Authorisation thresholds (Water Quality Regulations 2006)	❖ Treatment of wastewater must take place strictly according to the engineers' prescriptions in order to meet wastewater quality standards as set by Water Quality Regulations 2006, and treated wastewater must be monitored on a regular basis to verify quality. Wastewater discharge testing must be accurate and reliable. ❖ Monthly wastewater discharge monitoring by grab sampling. Discharge to be tested for pH, electrical conductivity (mS/m), faecal coliform (per 100ml), Chemical Oxygen Demand (mg/l), Ammonia as Nitrogen (mg/l), Nitrate/Nitrite as Nitrogen (mg/l), free Chlorine (mg/l), suspended solids (mg/l) and Ortho-Phosphate as Phosphorus (mg/l). Testing must be done by a laboratory accredited under the NEMA.	TWWDA or designated service provider	Operational period	
Contamination by irrigation with inadequately treated wastewater	Treated effluent should be chlorinated to ensure that any remaining pathogens are eliminated before the effluent is released Quality of wastewater used for irrigation must be tested monthly on the last day of the month by grab sampling, at the point where the wastewater enters the irrigation system. Wastewater must be tested for the parameters indicated In the Third schedule Water Quality Regulations 2006 Sludge and scum from the clarifier and chlorination contact channels will be redirected to the anaerobic digester for further treatment.	TWWDA or designated service provider	Operational period	

	Hand screens and grit channels must be cleaned regularly and the waste disposed of at an appropriate dumping site together with the dried sludge from the drying beds. Record must be kept of any spillage or leakage of untreated/ semi- treated effluent and site engineer notified to inspect and gauge significance			
Inadequate management if site operator is ill / on leave or resigns	At least two site operators must be fully trained in the operation of the site, so that one can stand in for the other in case of illness, leave, etc.	TWWDA Human Resources Division	Operational period	
Irregular or Inadequate maintenance could compromise functionality	Regular checking of key components of the system to verify continuing functionality as prescribed by the Consulting Engineers Regular replacement of key components as a preventative measure, even if components still appear to be functional All gauges to be monitored by the onsite plant manager at regular intervals (monitoring interval to be specified by engineer) A maintenance plan must be in place to ensure that planning, such as budget allocation or procurement of service providers, can be put into motion sufficiently ahead of time. Maintenance plan must take into account the lead times applicable to certain types of maintenance, e.g. long delivery times for certain components of the system.	Onsite plant manager	Operational period	

	Maintenance plan to be revisited annually and updated where necessary			
Improper waste disposal	Dried sewage sludge may be used by nearby farmers as fertilizer for appropriate types of crops. Coarse material removed from the hand screen and grit channels must be disposed of at a licensed landfill site. No waste may be burned or buried. The small volume of general solid waste expected to be generated by the staff onsite (e.g. food packaging) must be kept in a closable refuse bin until such time as it is taken to the landfill site. Littering (both on and around the site) must be strongly discouraged.	Onsite plant manager	Operational period	2,000,000.00
Release of unpleasant odours	Ensure that all components of the treatment plant are in good working order at all times. If the plant is functioning properly, the generation of odours should be minimized	Onsite plant manager	Operational period	No cost
Climate change	❖ Prepare and implement Contingency Plans for Phenomena associated with climate change such as flooding as provided for in the engineering designs of the development	Project architects and engineers	During design, implementation and operational stages of the project	Included in professional fees for consultants
Medical emergencies	❖ Have well trained first aid personnel on site at all times during installation, operationalization and decommissioning	Proponents, management and medical practitioners	Operational phase of the project cycle	Contingency fund to be established

	❖ Have an adequately equipped first aid kits within the WWTP premises at all times ❖ Have contact numbers of reliable health facilities and professional health practitioners			
Accidents and incidents	❖ Formulate and implement a health and safety program to address internal accidents and incidents.	Proponents, Management Occupants and Staff	Operational phase of the development	Contingency fund to be established

7.15 EMP for Decommissioning Phase

Anticipated Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Approx. Cost (KShs)
Legislative compliance	❖ Give adequate notice to the staff / stakeholders. ❖ Engage the services of legal experts ❖ Undertake due diligence environmental audit for the decommissioning and submit to NEMA at least 3 months prior to decommissioning for approval ❖ Obtain demolition permit from the County Government of Nairobi.	Proponents and management	At least 3 months to decommissioning	To be calculated at the time
Demolition waste	❖ Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3.Composting and reuse 4. Incineration 5. Sanitary Land filling. ❖ All laboratory equipment, set up structures and any other accessories within the Lab premises that will not be used for other purposes shall be removed and recycled/reused as far as possible ❖ All structures will be removed and recycled, reused or disposed of as per NEMA guidelines and as per manufacturer's instructions	Proponents and contractor	Throughout decommissioning phase	1,000,000.00

Anticipated Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Approx. Cost (KShs)
	❖ Where recycling/reuse is not possible, the materials should be taken to a licensed waste disposal site by a NEMA licensed waste handler.			

CHAPTER EIGHT: ENVIRONMENTAL MONITORING AND AUDITING.

For effective implementation of the EMP, a monitoring and evaluation (M & E) process should be instituted to act as a self-assessment tool to ensure compliance with the various components of the ESMMP. The DeKUT Sewage Treatment Plant Expansion and related facilities management are encouraged to formulate their own monitoring tools, with the fore knowledge that they will use it to judge their own performance without expert help. Of necessity, the M & E plan should include verifiable indicators to assist the management to:

a) Continuously check their compliance with the EMP and to accurately record stages of progress

b) Continuously observe and record any changes, positive and negative, to the environment as a direct or indirect consequence of their operations

c) Use government limits for various pollution control parameters as the basis for close monitoring of water, waste-water, air quality, hydrocarbons and heavy metals presence in the soil, solid waste and other environmental benchmarks

d) Use stated limits and M & E to alleviate negative impacts and seek expert advice on matters which merit such attention

e) Use the EMP and M & E tool to submit an Environmental Audit report to NEMA annually or as may be directed by the Authority without fail.

CHAPTER TEN: STUDY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

10.1 Study Findings

Water supply and sewerage within the project area

The respondents to the questionnaires that were distributed to gather the comments from the Interested and Affected Parties (IAPs) were 108 in number with 19% being young people between 18-35 years of age, 73% were medium aged people of 36-60 years whereas the rest were aged people making only 8%. NYEWASCO is the water supplying entity with over 98% coverage in water supply although sewerage connection in this project area is below 7% with most residential areas within the supply region using septic tank systems (36%) which are routinely exhausted by private contractors for disposal at the existing DeKUT or NYEWASCO Wastewater Treatment Plant (WWTP) in Kagemi. Other sanitary services commonly used are pit latrines (43% of respondents) and soak pits (6%). All residents interviewed welcomed the project with 74% of the respondents willing to allow the sewer lines to pass through their plots without any conditions while 13% will only allow it to pass through their plots if there are negotiations for compensation while only 2% will not allow the sewer line to pass through their plots mostly because they have already built or have plans that may be disrupted by a sewer line. 98% of the respondents recommended sewer line system as their preferred mode of waste water disposal with 72% preferring the Treatment plant to be located in DeKUT, 23% preferred the Engineer to decide while 5% gave other locations like Kangemi, Gatende or did not have a preferred location. 71% of respondents gave legal approvals as the main conditions for a development project with 21% suggesting consultation and public participation while 8% felt locals /youth employment was the main condition.

The suggested average one time connection fee to the sewer system for all the respondents consulted was Kshs. 2600 with Nyaribo suggesting an average of Kshs 540, Chaka Kshs 1210, Cluster one group (DeKUT meeting giving Kshs 5,250 and Embassy meeting giving Kshs. 2,400). The lowest suggested value was Kshs 100 and the highest suggested value was Kshs 20,000. This huge range on willingness to pay could be attributed mainly to land use with those with residential houses and hostels willing to pay higher while those connecting to their nuclear families with low incomes offering relatively low fees for connection. The government agencies meeting held at TWWDA offices in Nyeri however preferred set tariffs based on Water Resources Authority and Water Services Regulatory Board set guidelines.

Neighboring communities are experiencing a lot of distress regarding wastewater disposal as Treatment process at the existing DeKUT facility is not adequate and connection is very low. The untreated wastewater routinely finds its way into the surface water resources. Some of those consulted during the study indicated one of their biggest shock expenses is sanitation services provisions with the soil characteristics being water logged black cotton soils, sinking of toilets is a common scene and mixing of wastewater and surface run off is a common sight especially after raining.

Some exhauster trucks that dispose of wastewater from residential areas within the area do not follow the laid down procedures in disposal and charge exhorbitant prices by ensuring they make make many trips through carrying way below their capacity and sometimes pour effluent on the road and neighbouring environments. Other impacts associated with the existing facility include odour from the treatment ponds, mosquito bites and pollution of the Muringato River and other rivers within this catchment. The rivers are a source of drinking water for domestic animals as well as people for communities downstream

10.2 Conclusion

The proposed Wastewater Treatment Plant will accommodate the anticipated increased discharge from both new connections and existing ones as the population is expected to increase tremendously. A number of benefits are also associated with the proposed project. The treatment process will contain and remove potential disease-causing contaminants through a filtering system that blocks their path and further treatment (biological treatment) will kill harmful organisms. This keeps potential diseases and bacteria from entering other water sources, or the ground, and harming people as well as plants and animals. The proposed project will ultimately lead to a situation where pollution of the adjacent Muringato River is contained through application of appropriate wastewater treatment technologies. More importantly, a number of jobs will be created.

The measures put in place at Environmental and Social Management Plan will ensure there are very limited chances for occurrence of negative impacts categorized to be of low severity and spatial/temporal significance. On the basis of the evaluation of the development proposal, the project does not occasion environmentally significant negative impacts that could lead to environmental degradation on an appreciable scale throughout the project cycle. This ESIA project report therefore presents findings of **“no significant impacts”. The development of this project is considered economically viable, socially acceptable and environmentally sound.**

10.3 Recommendations

This report therefore recommends issuance of an EIA license on condition that the proposed EMP contained in this report will be implemented in line with other conditions that NEMA may impose during the decision making process. The proponents should use also the EMP as monitoring and evaluation tool to submit an Environmental Audit reports to NEMA annually or as may be directed by the Authority without fail.

11.0. REFERENCES

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9. The County Government Act (2012)
10. The Public Health Act – Laws of Kenya, Chapter 242
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18. Water Resources Management Authority (2009). Tana Water Catchment Area
19. Management Strategy

12.0 APPENDICES

Appendix 1: Consultancy and Public participation Questionnaires

Appendix 2: CPP Meeting Attendance lists

Appendix 3: Signed Public Participation and Consultations Meeting Minutes

Appendix 4: DeKUT Title deed

Appendix 6: EIA License

Appendix 7: TWWDA KRA Pin

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

The consultant is preparing Environmental Social Impact Assessment project report for proposed DeKUT Sewerage Project expansion and operationalization. The process requires adequate public consultations and involvement on the anticipated positive or negative impacts. The expected impacts have been categorized as per their effects on social wellbeing, economic progress or environmental aspects that might result from vegetation clearing, excavation, constructions, installations operationalization and eventual decommissioning of proposed DeKUT Sewerage Project. You are therefore requested to list your concerns in the spaces provided below for the purposes of consideration and inclusion in the Environmental Social Impact Management Plan to mitigate negative impacts of this project and as well to maximize the anticipated positive impacts.

Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 1/09/2021

Interviewee's Name	AGNES G. KIRURU
ID Number Interviewee's	7441972
Interviewee's Contact (phone)	0712535802
Interviewee Gender	Female
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

Some people use septick and others direct the gu... open ground.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

.....NO.....

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

.....No.....

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

.....No.....

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

.....NO.....

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

.....NO.....

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

.....By disposing to the Write Places and good construction of sewer.....

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

.....Yes.....

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

.....Approval.....

iii. Which Building regulations do you know?

.....

Dont build at the road way

iv. Are there public health issues you would like addressed in this project development?

.....

.....

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution

.....

Yes

.....

ii. The use of Biogas that can be produced from the treatment plant

.....

Yes

.....

iii. The use of manure as dried sludge from the wastewater treatment plant

.....

Yes

.....

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?

.....yes.....

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?

.....

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?

.....Yes.....

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

.....Yes.....

v. How do you foresee land values after sewerage connectivity?

land Prices will shoots

10. Which are the other wastes generated and how do you propose them to be handled?

Papers and diapers

11. How can the impacts you have highlighted be mitigated?

Apartunities of Jobs

12. Does the proposed project negatively affect your land use operations?

NO

13. What positive impacts will the proposed project have on your operations?

~~not~~ it will lower the deases and the land will and Values

14. Do you have any specific complains to make about this project?

NO

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

This Project will chage the enviroment in this town

Respondent Sign

[signature]

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

The consultant is preparing Environmental Social Impact Assessment project report for proposed DeKUT Sewerage Project expansion and operationalization. The process requires adequate public consultations and involvement on the anticipated positive or negative impacts. The expected impacts have been categorized as per their effects on social wellbeing, economic progress or environmental aspects that might result from vegetation clearing, excavation, constructions, installations operationalization and eventual decommissioning of proposed DeKUT Sewerage Project. You are therefore requested to list your concerns in the spaces provided below for the purposes of consideration and inclusion in the Environmental Social Impact Management Plan to mitigate negative impacts of this project and as well to maximize the anticipated positive impacts.

Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 1/9/2021

Interviewee's Name	Jane N Riuki
ID Number Interviewee's	21454698
Interviewee's Contact (phone)	0725064007
Interviewee Gender	Female
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   Many people use septick and others throw anyhowly

ii. What are the alternative methods for wastewater in this area?

N/A

iii. Which methods will you recommend?

drainage

2. Normal land use practices in this area

i. What is the main land use in this area currently?

Agriculture

ii. What is the future planned land use in this area?

livestock keeping

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

Kiganjo

ii. Where is the Sewage treatment plant currently located in this area?

Kiganjo

iii. Which other site(s) do you think are ideal for the location sewage plant?

chaka

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

yes

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

.....

..... no .....

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

..... no .....

.....

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

..... no .....

.....

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

yes

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

.....

..... no .....

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

.....

..... no .....

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

.....

..... no .....

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

.....

..... yes .....

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

..... Approve .....

.....

iii. Which Building regulations do you know?

.....

.....no buildings on near rivers.....

iv. Are there public health issues you would like addressed in this project development?

.....disposal of waste products.....

.....

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution

.....

.....yes.....

.....

ii. The use of Biogas that can be produced from the treatment plant

.....

.....yes.....

.....

iii. The use of manure as dried sludge from the wastewater treatment plant

.....

.....

.....yes.....

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?

.....yes.....

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?

.....500.....

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?

.....yes.....

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

.....yes.....

v. How do you foresee land values after sewerage connectivity?

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

The consultant is preparing Environmental Social Impact Assessment project report for proposed DeKUT Sewerage Project expansion and operationalization. The process requires adequate public consultations and involvement on the anticipated positive or negative impacts. The expected impacts have been categorized as per their effects on social wellbeing, economic progress or environmental aspects that might result from vegetation clearing, excavation, constructions, installations operationalization and eventual decommissioning of proposed DeKUT Sewerage Project. You are therefore requested to list your concerns in the spaces provided below for the purposes of consideration and inclusion in the Environmental Social Impact Management Plan to mitigate negative impacts of this project and as well to maximize the anticipated positive impacts.

Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 01/9/2021

Interviewee's Name	Benson Wachira
ID Number Interviewee's	37628648
Interviewee's Contact (phone)	0714527865
Interviewee Gender	Male
Age bracket	18-35 years ✓
	35-60 years
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

      Septic

      .....

iii. Which Building regulations do you know?
.....you should not construct buildings near.....
.....the road.....

iv. Are there public health issues you would like addressed in this project development?
.....NO.....
.....

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
.....Yes.....
.....
.....

ii. The use of Biogas that can be produced from the treatment plant
.....Yes.....
.....
.....

iii. The use of manure as dried sludge from the wastewater treatment plant
.....Yes.....
.....
.....

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
.....Yes.....

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
.....$36.....

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
.....NO.....

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?
.....Yes.....

v. How do you foresee land values after sewerage connectivity?

Creation of employment:

10. Which are the other wastes generated and how do you propose them to be handled?

plastics

11. How can the impacts you have highlighted be mitigated?

Being collected and recycled.

12. Does the proposed project negatively affect your land use operations?

NO

13. What positive impacts will the proposed project have on your operations?

It leads to growth of town

14. Do you have any specific complains to make about this project?

NO

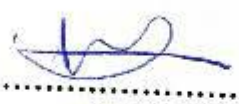
15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

It will lead to formation of a clean environment in the area

Respondent Sign



....

10. Which are the other wastes generated and how do you propose them to be handled?

...Storm Water...

11. How can the impacts you have highlighted be mitigated?

...Construction of good storm water...

12. Does the proposed project negatively affect your land use operations?

...No...

13. What positive impacts will the proposed project have on your operations?

- Cost effective / flow of information
- ...
- Efficiency

14. Do you have any specific complains to make about this project?

...No...

15. In your conclusion, do you welcome this project in the said area?

...Yes...

16. General comments, recommendations or observations on this project?

The project will be of much help to the community it improvement.

Respondent Sign

....

Chaka 3

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

The consultant is preparing Environmental Social Impact Assessment project report for proposed DeKUT Sewerage Project expansion and operationalization. The process requires adequate public consultations and involvement on the anticipated positive or negative impacts. The expected impacts have been categorized as per their effects on social wellbeing, economic progress or environmental aspects that might result from vegetation clearing, excavation, constructions, installations operationalization and eventual decommissioning of proposed DeKUT Sewerage Project. You are therefore requested to list your concerns in the spaces provided below for the purposes of consideration and inclusion in the Environmental Social Impact Management Plan to mitigate negative impacts of this project and as well to maximize the anticipated positive impacts.

Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 01/09/2021

Interviewee's Name	JAMES KINYUA WANJOHI
ID Number Interviewee's	7028777
Interviewee's Contact (phone)	0722 849016
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years —
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   ..... SEPTIC .....
   ..... OPEN SPACE .....

ii. What are the alternative methods for wastewater in this area?

.....NONE.....

.....

iii. Which methods will you recommend?

.....SEWERAGE SYSTEM.....

.....

2. Normal land use practices in this area

i. What is the main land use in this area currently?

.....CONSTRUCTION OF SETTLEMENT,

.....FARMING.....

ii. What is the future planned land use in this area?

.....CONSTRUCTION.....

.....

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

.....KIGANJO.....

.....

ii. Where is the Sewage treatment plant currently located in this area?

.....KANGEMI NYERI.....

.....

iii. Which other site(s) do you think are ideal for the location sewage plant?

.....KIGANJO.....

.....

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

.....YES.....

.....

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

.....None.....

.....

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

.....N/A.....

.....

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

.....NO.....

.....

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

YES

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

.....NO.....

.....

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

.....NO.....

.....

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

.....Looking For A Burning Area.....

.....

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

.....YES.....

.....

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

.....Public Participation.....

.....Disposal Mechanism.....

iii. Which Building regulations do you know?
Sewerage disposal Methods
Environment Impact Management

iv. Are there public health issues you would like addressed in this project development?
NONE

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
YES

ii. The use of Biogas that can be produced from the treatment plant
YES

iii. The use of manure as dried sludge from the wastewater treatment plant
YES

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
YES

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
2000 +

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
YES

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?
YES

v. How do you foresee land values after sewerage connectivity?
WILL RISE

Chaka 4

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)
Date: 18/9/2021

Interviewee's Name	Dominic Kanyi
ID Number Interviewee's	33380587[illegible]
Interviewee's Contact (phone)	0728-583927
Interviewee Gender	Male
Age bracket	18-35 years ✓
	35-60 years
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   ……⇒ Fallow disposal method……
   ……⇒ Pit latrines……

ii. What are the alternative methods for wastewater in this area?

=> Sewerage

iii. Which methods will you recommend?

=> Sewer systems

2. Normal land use practices in this area

i. What is the main land use in this area currently?

=> Commercial Motor / mining

ii. What is the future planned land use in this area?

=> Industrial / Commercial Motor

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

=> Nowa

ii. Where is the Sewage treatment plant currently located in this area?

=> Ligado

iii. Which other site(s) do you think are ideal for the location sewage plant?

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

=> Yes if Compensated

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

None

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

None

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

No

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

Yes

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

None

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

Avoid open burning

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

N/A

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

N/A

iii. Which Building regulations do you know?

.....N/A.....

.....

iv. Are there public health issues you would like addressed in this project development?

.....→ yes: building a health facility.....

.....

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution

.....

.....→ yes.....

.....

ii. The use of Biogas that can be produced from the treatment plant

.....

.....→ yes.....

.....

iii. The use of manure as dried sludge from the wastewater treatment plant

.....

.....→ yes.....

.....

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?

.....→ yes.....

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?

.....→ 2,000/=.....

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?

.....→ yes.....

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

.....→ yes.....

v. How do you foresee land values after sewerage connectivity?

The values of land will rise

10. Which are the other wastes generated and how do you propose them to be handled?

are Pollution

11. How can the impacts you have highlighted be mitigated?

involve professionals

12. Does the proposed project negatively affect your land use operations?

ND

13. What positive impacts will the proposed project have on your operations?

Increase income

14. Do you have any specific complains to make about this project?

No

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

The town will grow and investors will come

Respondent Sign

DeKUT cluster 1 (6)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 02/09/2021

Interviewee's Name	Ehun Mwangi Njamjiri
ID Number Interviewee's	20028163
Interviewee's Contact (phone)	0723518405
Interviewee Gender	Male
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   ......Septic tank......
   ....

i. Are there cultural sites within this locality where sewage project cannot be constructed?

No

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

No

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

Yes if not well maintained

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

Yes

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

No

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

Yes

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

Yes

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

Meet all legal conditions and avoid requirement

10. Which are the other wastes generated and how do you propose them to be handled?

Pass through electric waste

11. How can the impacts you have highlighted be mitigated?

Avoid accumulation

12. Does the proposed project negatively affect your land use operations?

Yes

13. What positive impacts will the proposed project have on your operations?

Reduction of soil erosion

14. Do you have any specific complains to make about this project?

Compensation where the sewerline passes through private land owners

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

Its well much welcomed

Respondent Sign

DeKUT cluster (3)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 2/9/2021

Interviewee's Name	PATRICK MWARERI GICHUHI
ID Number Interviewee's	[redacted]
Interviewee's Contact (phone)	[redacted]
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

   Pit latrines or drain in our land.
   ....

i. Are there cultural sites within this locality where sewage project cannot be constructed?

No

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

~~[illegible]~~ Wet land

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

No

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

Since I don't know the process I can not ~~[illegible]~~ conclude

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

No

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

It is good if we have wastewater plant and handle it well

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

Yes

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

To employ people from the said area during construction

land value will increase

10. Which are the other wastes generated and how do you propose them to be handled?

We will be guided by management of the plant management

11. How can the impacts you have highlighted be mitigated?

It will reduce pollution of rivers

12. Does the proposed project negatively affect your land use operations?

No

13. What positive impacts will the proposed project have on your operations?

It will reduce pollution poverty can be job creation

14. Do you have any specific complains to make about this project?

No

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

This project will benefit the area residents

Respondent Sign

DeKUT Cluster (4)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 2nd/September 2024

Interviewee's Name	David Mathenge
ID Number Interviewee's	
Interviewee's Contact (phone)	0720561541
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

   We do Self Septic Tank Plating

i. Are there cultural sites within this locality where sewage project cannot be constructed?

NON

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

NO BECAUSE WE have to devolop own Envilorment

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

NO

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

yes

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

YES but it will work

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

YES it Contructed

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

Yes

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

it will affect

It will be very fine

10. Which are the other wastes generated and how do you propose them to be handled?
To be collected by County Government

11. How can the impacts you have highlighted be mitigated?
Very higly mitigated

12. Does the proposed project negatively affect your land use operations?
By passing through our plots

13. What positive impacts will the proposed project have on your operations?
Our community will be clean an developed better.

14. Do you have any specific complains to make about this project?
Yes if the project here to use our land passing through them must compensate

15. In your conclusion, do you welcome this project in the said area?
Yes

16. General comments, recommendations or observations on this project?
Yah it is a good project in our area for development in our community at large.

Respondent Sign

DeKUT Cluster (3)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 2/9/2021

Interviewee's Name	NELSON M. MBUGUA
ID Number Interviewee's	29727-18
Interviewee's Contact (phone)	0710 846686
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

   Pit latrines, Septic tanks

i. Are there cultural sites within this locality where sewage project cannot be constructed?

None

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

None

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

No

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

~~Yes~~ No.

6. Atmospheric conditions and/or air quality.
   i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

   No.

   ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

   No.

   iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

   1. Treatment
   2. Carry away the wastes / left overs

7. **Regulations (Law) Compliance.**
   i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

   Yes

   ii. What are some of the conditions to be fulfilled by a developer before or during construction?

   Obtain approvals, NEMA assessments

Improve

10. Which are the other wastes generated and how do you propose them to be handled?

C.G.M - To collect the refuse

11. How can the impacts you have highlighted be mitigated?

12. Does the proposed project negatively affect your land use operations?

No

13. What positive impacts will the proposed project have on your operations?

Improve Sanitary Situation in area
Provide employment

14. Do you have any specific complains to make about this project?

No

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

It should start soonest

Respondent Sign

DeKUT cluster1 (2)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 2/9/2021

Interviewee's Name	MONICA WANGARI MURINGI
ID Number Interviewee's	22493541
Interviewee's Contact (phone)	0731637 111
Interviewee Gender	FEMALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

1: Septic tank
2: Pit latrines

i. Are there cultural sites within this locality where sewage project cannot be constructed?
No.

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?
None.

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?
No. The waste will be treated.

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?
Yes.

6. Atmospheric conditions and/or air quality.
   i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?
   Yes, but will only be for a short period.
   ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?
   A bit.
   iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?
   Treating it the best way possible.

7. **Regulations (Law) Compliance.**
   i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?
   Yes - No building near rivers.
   ii. What are some of the conditions to be fulfilled by a developer before or during construction?
   - To get all the required licences from all the government.

The value will go up.

10. Which are the other wastes generated and how do you propose them to be handled?

- Disposing them the best way possible.
-

11. How can the impacts you have highlighted be mitigated?

- Burning the papers.
- Burying the other waste.
- Dying

12. Does the proposed project negatively affect your land use operations?

NO.

13. What positive impacts will the proposed project have on your operations?

- Give the residential people jobs.

14. Do you have any specific complains to make about this project?

NO.

15. In your conclusion, do you welcome this project in the said area?

Yes.

16. General comments, recommendations or observations on this project?

- Environment cleanliness.
-

Respondent Sign

Ndegwa

Embassy (11)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 21/9/2021

Interviewee's Name	JOSEPH MAINA KINUTHIA
ID Number Interviewee's	10325642
Interviewee's Contact (phone)	0723240557
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

   .....Pit latrines.....

   .....Septic tank.....

ii. What are the alternative methods for wastewater in this area?

Sewerage

Bio digester

iii. Which methods will you recommend?

Sewerage

2. Normal land use practices in this area

i. What is the main land use in this area currently?

Farming

Residential, Commercial

ii. What is the future planned land use in this area?

Building Commercial houses

Farming

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

Nothing N/A

ii. Where is the Sewage treatment plant currently located in this area?

N/A

iii. Which other site(s) do you think are ideal for the location sewage plant?

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

Yes

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

NO

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

NO

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

NO

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

YES

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

NO

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

NO

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

They keep flatten the earth after completion

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

YES

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

Comply with the law

iii. Which Building regulations do you know?
NEMA, Public Health Act
NEMA

iv. Are there public health issues you would like addressed in this project development?
Impact assessment (NEMA)

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
YES

ii. The use of Biogas that can be produced from the treatment plant
YES

iii. The use of manure as dried sludge from the wastewater treatment plant
YES

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
YES

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
3500

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
YES

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?
YES

v. How do you foresee land values after sewerage connectivity?

COMPETITIVE

10. Which are the other wastes generated and how do you propose them to be handled?

County government to collect
paper, cartons, stone etc

11. How can the impacts you have highlighted be mitigated?

County government to collect

12. Does the proposed project negatively affect your land use operations?

NO

13. What positive impacts will the proposed project have on your operations?

Our environment less invasion
land value

14. Do you have any specific complains to make about this project?

NO

15. In your conclusion, do you welcome this project in the said area?

YES

16. General comments, recommendations or observations on this project?

It would bring positive attitude

Respondent Sign

Embassy (14)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

The consultant is preparing Environmental Social Impact Assessment project report for proposed DeKUT Sewerage Project expansion and operationalization. The process requires adequate public consultations and involvement on the anticipated positive or negative impacts. The expected impacts have been categorized as per their effects on social wellbeing, economic progress or environmental aspects that might result from vegetation clearing, excavation, constructions, installations operationalization and eventual decommissioning of proposed DeKUT Sewerage Project. You are therefore requested to list your concerns in the spaces provided below for the purposes of consideration and inclusion in the Environmental Social Impact Management Plan to mitigate negative impacts of this project and as well to maximize the anticipated positive impacts.

Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 21/9/2021

Interviewee's Name	ANASTACIA WANGUI K.
ID Number Interviewee's	24387317
Interviewee's Contact (phone)	0727622734
Interviewee Gender	FEMALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

   Pit Latrines

   Septic tank

ii. What are the alternative methods for wastewater in this area?

Sewarage

Bio digster

iii. Which methods will you recommend?

Sewarage

2. Normal land use practices in this area

i. What is the main land use in this area currently?

Farming

residance

ii. What is the future planned land use in this area?

commercial houses

Farming

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

None (not available)

ii. Where is the Sewage treatment plant currently located in this area?

None

iii. Which other site(s) do you think are ideal for the location sewage plant?

Expert to advise

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

yes

4. Historical and/or cultural heritage resources.

High

10. Which are the other wastes generated and how do you propose them to be handled?

County Goverment.

Paper, Cartons.

11. How can the impacts you have highlighted be mitigated?

Through County Goverment to collect.

12. Does the proposed project negatively affect your land use operations?

No

13. What positive impacts will the proposed project have on your operations?

- Clean Environment - Ownership connection
- Increased land value - less disease

14. Do you have any specific complains to make about this project?

No

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

It will help us to be in clean environment

Respondent Sign

A.K.

Embassy (17)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 2nd sep 2021

Interviewee's Name	JOSHUA MUCHEKE MAINA.
ID Number Interviewee's	29622474
Interviewee's Contact (phone)	0726696180
Interviewee Gender	Male.
Age bracket	18-35 years ✓
	35-60 years
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   ..... Bio septic tank and Pit latrine .....
   .....

they will rise up

10. Which are the other wastes generated and how do you propose them to be handled?

late can dispose to our County government

11. How can the impacts you have highlighted be mitigated?

to burn them

12. Does the proposed project negatively affect your land use operations?

NO

13. What positive impacts will the proposed project have on your operations?

clean environment, less diseases

14. Do you have any specific complains to make about this project?

NO

15. In your conclusion, do you welcome this project in the said area?

N/A

16. General comments, recommendations or observations on this project?

for the it will community in many areas like land will give rise up to

Respondent Sign

Embassy (15)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 02/09/2021

Interviewee's Name	SIMON NGURE MWANGI
ID Number Interviewee's	23689146
Interviewee's Contact (phone)	0721167750
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   - Pit latrines
   - Septic Tanks

i. Are there cultural sites within this locality where sewage project cannot be constructed?

.....NO.....

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

.....NO.....

.....

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

.....NO.....

.....

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

NO

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

.....

.....NO.....

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

.....

.....NO.....

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

.....Carry the waste or that remains.....

.....

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

.....Yes.....

.....

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

.....Comply with the Laws.....

.....

iii. Which Building regulations do you know?

.....NCA.....

.....Public Health / Nema.....

iv. Are there public health issues you would like addressed in this project development?

.....Nema.....

.....

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution

.....Yes.....

.....

.....

ii. The use of Biogas that can be produced from the treatment plant

.....yes.....

.....

.....

iii. The use of manure as dried sludge from the wastewater treatment plant

.....Yes.....

.....

.....

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?

.....Yes.....

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?

.....Five Thousand Kenya Shillings.....

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?

.....Yes.....

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

.....Yes.....

v. How do you foresee land values after sewerage connectivity?

....It will create automatically (add value)....

10. Which are the other wastes generated and how do you propose them to be handled?

.....County government to handle or collect.....
Paving of estates/farms.....

11. How can the impacts you have highlighted be mitigated?

.....County government to collect.....
.....

12. Does the proposed project negatively affect your land use operations?

....NO.....

13. What positive impacts will the proposed project have on your operations?

...Add value to lands.....
-Clean environment.....
-minimal diseases

14. Do you have any specific complains to make about this project?

.....XPO.....
.....

15. In your conclusion, do you welcome this project in the said area?

.....YES.....

16. General comments, recommendations or observations on this project?

.....It a good one and should take Place.....
.....Soonest.....

Respondent Sign

.....

Nyamimbo (1)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

The consultant is preparing Environmental Social Impact Assessment project report for proposed DeKUT Sewerage Project expansion and operationalization. The process requires adequate public consultations and involvement on the anticipated positive or negative impacts. The expected impacts have been categorized as per their effects on social wellbeing, economic progress or environmental aspects that might result from vegetation clearing, excavation, constructions, installations operationalization and eventual decommissioning of proposed DeKUT Sewerage Project. You are therefore requested to list your concerns in the spaces provided below for the purposes of consideration and inclusion in the Environmental Social Impact Management Plan to mitigate negative impacts of this project and as well to maximize the anticipated positive impacts.

Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 1st September 2021.

Interviewee's Name	STEPHEN GITONGA MWANGI
ID Number Interviewee's	13542920
Interviewee's Contact (phone)	0723517138
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   (1) waste water is disposed within the area of use or to water farming land
   (2) Pit

ii. What are the alternative methods for wastewater in this area?

Sewerage System

iii. Which methods will you recommend?

Sewerage System

2. Normal land use practices in this area

i. What is the main land use in this area currently?

1/2 acre

ii. What is the future planned land use in this area?

1/2 acre

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

N/A

ii. Where is the Sewage treatment plant currently located in this area?

N/A

iii. Which other site(s) do you think are ideal for the location sewage plant?

No idea

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

YES

4. Historical and/or cultural heritage resources.

N/A

i. Are there cultural sites within this locality where sewage project cannot be constructed?

N/A

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

N/A

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

N/A

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

YES

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

NO

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

NO

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

NO

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

not aware

iii. Which Building regulations do you know?

.....non.....

.....

iv. Are there public health issues you would like addressed in this project development?

.....No.....

.....

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution

.....

.....yes.....

.....

ii. The use of Biogas that can be produced from the treatment plant

.....cooking.....

.....Lighting.....

.....

iii. The use of manure as dried sludge from the wastewater treatment plant

.....in farming.....

.....

.....

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?

.....yes.....

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?

.....As regulated.....

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?

.....yes.....

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

.....yes.....

v. How do you foresee land values after sewerage connectivity?

.....

10. Which are the other wastes generated and how do you propose them to be handled?

.....none.....

.....

11. How can the impacts you have highlighted be mitigated?

.....

.....

12. Does the proposed project negatively affect your land use operations?

.....NO.....

13. What positive impacts will the proposed project have on your operations?

.....none.....

.....

14. Do you have any specific complains to make about this project?

.....N/A.....

.....

15. In your conclusion, do you welcome this project in the said area?

.....Yes.....

16. General comments, recommendations or observations on this project?

.....We need modern waste water.....

.....Management.....

Respondent Sign

.....

Nyaribo (3)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 1/09/2021

Interviewee's Name	John Kihenja Kamwaro
ID Number Interviewee's	0583631
Interviewee's Contact (phone)	0722490371
Interviewee Gender	Male
Age bracket	18-35 years
	35-60 years
	Over 65 years ✓

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   ..... Directed to the roads .....
   .....

ii. What are the alternative methods for wastewater in this area?

Pit latrines

iii. Which methods will you recommend?

Sewer line.

2. Normal land use practices in this area

i. What is the main land use in this area currently?

Peasant Farming

Rental houses.

ii. What is the future planned land use in this area?

Rental houses.

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

N/A

ii. Where is the Sewage treatment plant currently located in this area?

N/A

iii. Which other site(s) do you think are ideal for the location sewage plant?

Any available site.

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

Yes.

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?
Trading centers

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?
None.

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?
Yes

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?
Yes

6. Atmospheric conditions and/or air quality.
   i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?
   No
   ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?
   No
   iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?
   The place for project to be covered so that there is no direct contamination of the atmosphere.

7. **Regulations (Law) Compliance.**
   i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?
   Yes
   ii. What are some of the conditions to be fulfilled by a developer before or during construction?
   Compensation of people who's the project will pass through their land.
   follow the laws of Nema and NCA.

iii. Which Building regulations do you know?
The building doesn't affect the inhabitants.

iv. Are there public health issues you would like addressed in this project development?
Yes incase the management of sewage is not properly done.

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
Yes

ii. The use of Biogas that can be produced from the treatment plant
Yes

iii. The use of manure as dried sludge from the wastewater treatment plant
Yes

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
Yes

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
Half of the annual of the water bill

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
Yes

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?
Yes

v. How do you foresee land values after sewerage connectivity?

It will increase

10. Which are the other wastes generated and how do you propose them to be handled?

Solid waste changing the waste to be used by the local peoples

11. How can the impacts you have highlighted be mitigated?

No Idea

12. Does the proposed project negatively affect your land use operations?

NO

13. What positive impacts will the proposed project have on your operations?

It will improve on these renting houses to enjoy the accommodations

14. Do you have any specific complains to make about this project?

NO with proper management there is no complain

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

The area for the sitting of the sewer plant is far from trading centre.

Respondent Sign

[signature]

Nyan'bo (11)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 01/09/2021

Interviewee's Name	ERNEST IRUNGU
ID Number Interviewee's	7635893
Interviewee's Contact (phone)	0721 980328
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

Pits

Waste water is disposed into the roads and fields.

ii. What are the alternative methods for wastewater in this area?

- letting nature to take its cause.
- Septic tank, Soak pit

iii. Which methods will you recommend?

-(1) Sewarage System -

2. Normal land use practices in this area

i. What is the main land use in this area currently?

- Farming.
- Mining - Quary -

ii. What is the future planned land use in this area?

People are settling in high numbers, thus Sub dviding - Sub dividing the land into plots.

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

In Nyeri town - we have none in our area.

ii. Where is the Sewage treatment plant currently located in this area?

There is none.

iii. Which other site(s) do you think are ideal for the location sewage plant?

- There is one at Kigango, so it can be connected after expansion - the engineers to suggest.

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

Yes.

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

There is None

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

Not known - People in this area/location are enlightened and knows the importance of Sewage system

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

No

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

Yes

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

No

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

No

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

Once the trenches are dug the same soil can be used to cover the pipes

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

Yes

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

Preparing of an impact report on the Sewerage

iii. Which Building regulations do you know?
A building should have a Sewerage to connect to a Sewerage line as per County by laws.

iv. Are there public health issues you would like addressed in this project development?
NO

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
Yes

ii. The use of Biogas that can be produced from the treatment plant
It can

iii. The use of manure as dried sludge from the wastewater treatment plant
Yes it can used by the farmers

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
Yes

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
One hundred Shillings

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
Yes

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?
Yes

v. How do you foresee land values after sewerage connectivity?

It will go up

10. Which are the other wastes generated and how do you propose them to be handled?
Waste from pit latrines can be
connected to the Sewerage

11. How can the impacts you have highlighted be mitigated?
through having a Sewerage system

12. Does the proposed project negatively affect your land use operations?
No

13. What positive impacts will the proposed project have on your operations?
Health wise - Water borne diseases
like Cholera will be reduced.

14. Do you have any specific complains to make about this project?
No.

15. In your conclusion, do you welcome this project in the said area?
Very much

16. General comments, recommendations or observations on this project?
Its a good project. Looking forward to its
implementation.

Respondent Sign

Nyaribo (17)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 01/09/2021

Interviewee's Name	Boniface Riba
ID Number Interviewee's	29958769
Interviewee's Contact (phone)	0725478968
Interviewee Gender	Male
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   Digging trenches and pit latrines
   .....

ii. What are the alternative methods for wastewater in this area?

People use sew septict tanks that take used up water from their residential compound

iii. Which methods will you recommend?

Sewerage System

2. Normal land use practices in this area

i. What is the main land use in this area currently?

Angriculture, this is planting food crops and keeping domestic animals, Also mining

ii. What is the future planned land use in this area?

Residential houses for rent and businesses

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

At current there is no Sewerage this system in this area

ii. Where is the Sewage treatment plant currently located in this area?

Nowhere

iii. Which other site(s) do you think are ideal for the location sewage plant?

[illegible] Engineers will identify.

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

Yes

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

No

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

No cultural briefs

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

No

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

Yes

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

No

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

If handled handled well, it won't

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

They should correct them and use it as they wish and restore where they destroyed

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

Yes

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

To meet the engagement of Community and to pay the due cost

iii. Which Building regulations do you know?
Building should meet the relevant authorised standard

iv. Are there public health issues you would like addressed in this project development? Yes, This facilitator project should strategise how to manage the project after completion so as to ensure health issues are addressed

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
Yes

ii. The use of Biogas that can be produced from the treatment plant
Yes

iii. The use of manure as dried sludge from the wastewater treatment plant
Yes

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
Yes

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
2 thousands

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
Yes

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

v. How do you foresee land values after sewerage connectivity?

The value will rise up.

10. Which are the other wastes generated and how do you propose them to be handled?
County Government to ~~include~~ include
Nyaribo for garbage collection

11. How can the impacts you have highlighted be mitigated?
By being collected by county
government vechiles

12. Does the proposed project negatively affect your land use operations?
No

13. What positive impacts will the proposed project have on your operations?

14. Do you have any specific complains to make about this project?
No

15. In your conclusion, do you welcome this project in the said area?
Yes

16. General comments, recommendations or observations on this project?
It will make this ave attrack
many business people

Respondent Sign

DeKUT Cluster 4

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

The consultant is preparing Environmental Social Impact Assessment project report for proposed DeKUT Sewerage Project expansion and operationalization. The process requires adequate public consultations and involvement on the anticipated positive or negative impacts. The expected impacts have been categorized as per their effects on social wellbeing, economic progress or environmental aspects that might result from vegetation clearing, excavation, constructions, installations operationalization and eventual decommissioning of proposed DeKUT Sewerage Project. You are therefore requested to list your concerns in the spaces provided below for the purposes of consideration and inclusion in the Environmental Social Impact Management Plan to mitigate negative impacts of this project and as well to maximize the anticipated positive impacts.

Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 2nd/September 2021

Interviewee's Name	David Mathenge
ID Number Interviewee's	
Interviewee's Contact (phone)	0720561941
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

   We do Self septic Tank piping

ii. What are the alternative methods for wastewater in this area?

pit latrine

iii. Which methods will you recommend?

sewa system

2. Normal land use practices in this area

i. What is the main land use in this area currently?

notcultume

ii. What is the future planned land use in this area?

it will be used as hostels for students from D.Kut

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

to be NETAvailable

ii. Where is the Sewage treatment plant currently located in this area?

in Dekut

iii. Which other site(s) do you think are ideal for the location sewage plant?

~~It is at Here~~ at Dekut Treatment Area

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

To be Compensited

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

NON

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

NO BECAUSE WE have to develop
DUE ENVIRONMENT

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

NO

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

YES

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

YES but it will have

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

YES it Constructed

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

YES

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

it will affect

iii. Which Building regulations do you know?
should have a Sewage System

iv. Are there public health issues you would like addressed in this project development?
common dump Site

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
it will not affect

ii. The use of Biogas that can be produced from the treatment plant
YES it will be useful to the community

iii. The use of manure as dried sludge from the wastewater treatment plant
can be sold to the community

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
NO

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
NON

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
YES so much change

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?
YES

v. How do you foresee land values after sewerage connectivity?

Improve:

10. Which are the other wastes generated and how do you propose them to be handled?

C.G.M - To collect the refuse

11. How can the impacts you have highlighted be mitigated?

12. Does the proposed project negatively affect your land use operations?

No

13. What positive impacts will the proposed project have on your operations?

Improve Sanitary Situation in area
Provide employment

14. Do you have any specific complains to make about this project?

No

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

It Should Start Soonest.

Respondent Sign

DeKUT Cluster (3)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 2/9/2021

Interviewee's Name	NELSON M. MBUTHIA
ID Number Interviewee's	29727718
Interviewee's Contact (phone)	0710666686
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

   Pit latrines ... Septic tanks .....

   .....

ii. What are the alternative methods for wastewater in this area?

Sewerage

iii. Which methods will you recommend?

Sewerage

2. Normal land use practices in this area

i. What is the main land use in this area currently?

Subsistence farming, Residential

ii. What is the future planned land use in this area?

Residential, Commercial

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

None here

ii. Where is the Sewage treatment plant currently located in this area?

None

iii. Which other site(s) do you think are ideal for the location sewage plant?

All over, around Dekut

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

Yes

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?

None

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

None

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

No

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

~~Yes~~ No

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

No

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

No

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

1. Treatment
2. Carry away the wastes / left overs

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

Yes

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

Obtain approvals, NEMA assessments

iii. Which Building regulations do you know?

NCA, ARVs,

iv. Are there public health issues you would like addressed in this project development?

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution

Yes

ii. The use of Biogas that can be produced from the treatment plant

Yes.

iii. The use of manure as dried sludge from the wastewater treatment plant

Yes.

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?

Yes

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?

Kshs 5000/=

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?

Yes.

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

Yes.

v. How do you foresee land values after sewerage connectivity?

It will be very plind

10. Which are the other wastes generated and how do you propose them to be handled?

To be collected by County Government

11. How can the impacts you have highlighted be mitigated?

Very higly mitigated

12. Does the proposed project negatively affect your land use operations?

By passing through our plots

13. What positive impacts will the proposed project have on your operations?

Our community will be clean an developed better.

14. Do you have any specific complains to make about this project?

YES if the project here to use our land passing through they must compensate

15. In your conclusion, do you welcome this project in the said area?

YES

16. General comments, recommendations or observations on this project?

Yah it is a good project in our area for development in our Community at large.

Respondent Sign

iii. Which Building regulations do you know?
-Inspection by the public health.

iv. Are there public health issues you would like addressed in this project development?
-Make sure that all constructions are approved.

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
Yes

ii. The use of Biogas that can be produced from the treatment plant
Yes

iii. The use of manure as dried sludge from the wastewater treatment plant
Yes.

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
Yes.

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
Ksh. 5000

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
Yes.

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?
Yes

v. How do you foresee land values after sewerage connectivity?

DeKUT cluster 9

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 02/09/2021

Interviewee's Name	Samuel Wanjau Muriuki
ID Number Interviewee's	20297339
Interviewee's Contact (phone)	0722727520
Interviewee Gender	Male
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   ...Pit Latrines and Septic tanks.....
   .....

10. Which are the other wastes generated and how do you propose them to be handled?

Bio degradable food plants. Should be collected by the county government.

11. How can the impacts you have highlighted be minimized?

A modern waste processing plant should be considered

12. Does the proposed project negatively affect your [illegible] operations?

NO

13. What positive impacts will the proposed project have on your operations?

Civilized waste Management, Clean Environment Employment to the locals

14. Do you have any specific complains to make about the project?

NO.

15. In your conclusion, do you welcome this project in your area?

Yes. It should be done hastily.

16. General comments, recommendations or observations on the project?

My hope is that the project wont bring a heavy financial burden to the beneficiaries.

Respondent Sign

Lawen S.M.

DeKUT cluster 1 (10)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 02/09/2021

Interviewee's Name	Joyce Gichoki
ID Number Interviewee's	26632388
Interviewee's Contact (phone)	0742885577
Interviewee Gender	female.
Age bracket	18-35 years ✓
	35-60 years
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?

   ...We are using personal pits which is enough for our home only...

iii. Which Building regulations do you know?

Public Health

iv. Are there public health issues you would like addressed in this project development?

No.

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution

Yes.

ii. The use of Biogas that can be produced from the treatment plant

Yes. It will be able to adequately dispose off water.

iii. The use of manure as dried sludge from the wastewater treatment plant

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?

Yes

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?

About 1000.

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?

Yes.

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

Yes. NYAWASCO is always ready for assistance

v. How do you foresee land values after sewerage connectivity?

DeKUT cluster (4)

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 02/09/2021

Interviewee's Name	JOHN MUGO GITHAE	
ID Number Interviewee's	7918603	
Interviewee's Contact (phone)	0722996687	
Interviewee Gender	MALE	
Age bracket	18-35 years	
	35-60 years	✓
	Over 65 years	

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   - Pit Latrine, Soak Pit, Cess pool
   open Soakaways

i. Are there cultural sites within this locality where sewage project cannot be constructed?

NO

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?

NONE

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?

No with the correct Technical Designs

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?

YES

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?

NO

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?

NO

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?

By following the laid down statutory requirements

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?

YES

ii. What are some of the conditions to be fulfilled by a developer before or during construction?

- Submission of Designs to County Government

10. Which are the other wastes generated and how do you propose them to be handled?

Solid waste

Waste water

11. How can the impacts you have highlighted be mitigated?

Follow the regulations

12. Does the proposed project negatively affect your land use operations?

No

13. What positive impacts will the proposed project have on your operations?

Safe on the cost of living; Improve hygiene and clean environment

14. Do you have any specific complains to make about this project?

No

15. In your conclusion, do you welcome this project in the said area?

YES

16. General comments, recommendations or observations on this project?

The project will go a long way in improving the welfare of the communities around. Recommended!

Respondent Sign

Institutional stakeholders (8)
@ Tana water.

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 3/09/2021

Interviewee's Name	PATRICIA MUSAID
ID Number Interviewee's	ID42052[illegible]
Interviewee's Contact (phone)	0721935[illegible]34
Interviewee Gender	FEMALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   ..... Septic tanks, ... Exhauster ..... Pit latrine, ... Sewerline ..... Nyeri ..... town ..... & ..... its ..... environs .....

ii. What are the alternative methods for wastewater in this area?

.....

.....

iii. Which methods will you recommend?

.....Sewer line.....

.....

2. Normal land use practices in this area

i. What is the main land use in this area currently?

.....Residentials & Commercial.....

.....

ii. What is the future planned land use in this area?

.....Same.....

.....

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

.....

.....

ii. Where is the Sewage treatment plant currently located in this area?

.....I know they are here under.....

.....Nyeri Water & Sewerage Company....

iii. Which other site(s) do you think are ideal for the location sewage plant?

.....Where it can flow by.....

...gravity.....

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

.....With some Compensation.....

.....

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?
Cemetry in graveyards

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?
Bones

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?
Yes it not will treated and mantained

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent? Yes

6. Atmospheric conditions and/or air quality.

i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?
Yes - dust

ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?
Yes - Smell

iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?
Well treated effluent from Industries

7. **Regulations (Law) Compliance.**

i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc? WRA,
Yes

ii. What are some of the conditions to be fulfilled by a developer before or during construction?
Seek Approvals and Permit before construction from WRA as a regulator

iii. Which Building regulations do you know?
Design Approvals

iv. Are there public health issues you would like addressed in this project development?
Ensure Sewer bursts are addressed immediately and effluent treated to meet standards before being discharged to NWW

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution
Yes

ii. The use of Biogas that can be produced from the treatment plant
Yes

iii. The use of manure as dried sludge from the wastewater treatment plant
Yes

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?
Yes

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?
according to laid down tariffs

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?
Yes

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?
Yes

v. How do you foresee land values after sewerage connectivity? More valued

10. Which are the other wastes generated and how do you propose them to be handled?

Solid wastes, livestock lot

11. How can the impacts you have highlighted be mitigated?

recycling

12. Does the proposed project negatively affect your land use operations?

N/A

13. What positive impacts will the proposed project have on your operations?

Reduce pollution likelihood to water resources

14. Do you have any specific complains to make about this project?

To adhere to regulations as stated in Water Act 2016 and Water resource management rules 2007

15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

This is a wonderful initiative to take care of the area not covered by sewer line.

Respondent Sign

[signature]

Institutional Stakeholders (9)
@ Tana Water.

PUBLIC PARTICIPATION AND CONSULTATION

QUESTIONNAIRE FOR IMPACTS OF DeKUT SEWERAGE PROJECT EXPANSION IN NYERI SUBCOUNTY

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Project Name: DeKUT Sewerage Project

Project Proponent: Tana Water Works Development Agency (TWWDA)

Date: 3/09/2021

Interviewee's Name	ROBERT CHEMUCET.
ID Number Interviewee's	21192663
Interviewee's Contact (phone)	0721388353
Interviewee Gender	MALE
Age bracket	18-35 years
	35-60 years ✓
	Over 65 years

1. Current methods of home wastewater disposal in the proposed project area
   i. What are the types of wastewater disposal techniques practiced in this area?
   Use of septic tanks
   .....
   .....

ii. What are the alternative methods for wastewater in this area?

Developed waste water treatment Sewage establishment.

iii. Which methods will you recommend?

2. Normal land use practices in this area

i. What is the main land use in this area currently?

Agricultural

ii. What is the future planned land use in this area?

Urbanization.

3. Current and future Sewerage project infrastructure

i. Where are the sewer lines currently located?

None

ii. Where is the Sewage treatment plant currently located in this area?

Privately established for small scale.
→ None for general public.

iii. Which other site(s) do you think are ideal for the location sewage plant?

iv. Will you allow the proponent to pass the sewer line through your plot if it is found to be the ideal positioning?

Will discuss with the manggement in Ruiru Ltd revert as soon as possible.

4. Historical and/or cultural heritage resources.

i. Are there cultural sites within this locality where sewage project cannot be constructed?
N/A

ii. Cultural briefs in handling Wastewater that may hinder location of the Treatment plant or passing of the sewer?
N/A

5. **Hydro geological and/or surface water resources conditions**

i. Will the establishment of Wastewater plant lead to pollution of underground water resources?
No. If properly managed.

ii. Is the proposed sewerage project installation likely to reduce pollution from the effluent?
Yes

6. Atmospheric conditions and/or air quality.
   i. Will the activities undertaken during construction period negatively impact atmospheric conditions or air quality?
   No

   ii. Are the operations and maintenance activities likely to negatively influence atmospheric conditions or air quality?
   No

   iii. How can the proponent manage the project's Waste (used materials/products) to minimize impacts on atmospheric conditions and /or air quality?
   Use environmentally friendly materials

7. **Regulations (Law) Compliance.**
   i. Are you aware of the environmental laws and regulations (NEMA Mandate) and Constructions laws and regulations (NCA mandate) etc?
   Yes

   ii. What are some of the conditions to be fulfilled by a developer before or during construction?
   have NEMA office and give EIA licence

iii. Which Building regulations do you know?

.....

.....

iv. Are there public health issues you would like addressed in this project development?

Management containement of Spillages

.....

8. Do you think this project will accrue the benefits below to the multi dwelling units in this project area?

i. Better management of WW to avoid soil and water pollution

Yes

.....

.....

ii. The use of Biogas that can be produced from the treatment plant

Yes

.....

.....

iii. The use of manure as dried sludge from the wastewater treatment plant

Yes

.....

.....

9. Likely social issues scenarios during operation of the wastewater treatment project.

i. Are you willing to pay the charges for one time connection to sanitation services by NYEWASCO?

.....

ii. How much are you willing to pay NYEWASCO for one time connection to their sewer line services?

.....

iii. Is the anesthetic value of the environment likely to change after provision of sanitation services?

Yes

.....

iv. Are you comfortable with efficiency of sanitary services delivery (response times to distress calls) once you connect to sewer based on experiences from water supply?

Response by water supply has been good.

v. How do you foresee land values after sewerage connectivity?

It will go up.

.....

10. Which are the other wastes generated and how do you propose them to be handled?

.....

.....

11. How can the impacts you have highlighted be mitigated?

.....

.....

12. Does the proposed project negatively affect your land use operations?

No

.....

13. What positive impacts will the proposed project have on your operations?

.....

.....

14. Do you have any specific complains to make about this project?

.....

.....

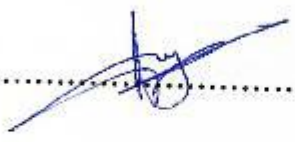
15. In your conclusion, do you welcome this project in the said area?

Yes

16. General comments, recommendations or observations on this project?

The project will have huge impact on food and economy of the ~~the~~ entire area.

Respondent Sign



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ATTENDANCE LIST

1ST MEETING ON PROPOSED DeKUT SEWERAGE PROJECT EXPANSION TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT NYERI SUBCOUNTY

Venue: NYARIBO Date: 1st September 2021

Time: 2pm to

S/NO.	NAME OF PARTICIPANT	ORGANIZATION	MOBILE PHONE	SIGN.
1	Pst Boniface Ruba	Kenya Assemblies of God	0725475948	[signature]
2	NELSON MBERENYA	County Administrator CGN	0710868686	[signature]
3	MARY N. MWANGI	NGAO	0724532828	[signature]
4	STEPHEN M. MURETHI	NGAO	0724317308	[signature]
5	DANIEL WANGOMBE N	CBO	0710962238	[signature]
6	BERNARD MUGUMO	CBO	0720440502	[signature]
7	WAMBUGU J.R	CBO	0720281858	[signature]
8	PAULINE M KAGATHI	Maendeleo ya Wanawake CBO	0725987625	[signature]
9	AGNES W MUCHEMI	Maendeleo CBO	0727028699	[signature]
10	Pastor Stephen Gitonga	AIPCA Church	0722517138	[signature]
11	JAMES CHANGWWAY	SCHOOL KIGANJO	0721450587	[signature]
12	PIERA WAMBUI	CBO	0722165808	[signature]
13	GEORGE KUHORA	CBO	0716461459	[signature]
14	James Wahome	Principal Nyaribo Sec	0721327957	[signature]
15	ERNEST IRUNGU	HEADTEACHER NYARIBO PRI	0721980228	[signature]
16	Mwalimu WERU NGATIA	NYARIBO-MUTHAIGA	0725-488-576	[signature]
17	Mary Wangui Ndirangu	Nyaribo Hon. Knight	0724597570	[signature]
18	Irene Wangui Wachiuri	Nyaribo / Hon A	0720881624	[signature]
19	Benson Ndirangu Wambugu	Gitegi	0720404215	[signature]

20 George Mwendwa Thuku Nyambo 0711564307 [signature]

21. MCA Hon MARGRET MUTHONI WAKURUGA 0722914840 [signature]

22. Chief

©

(1)

ATTENDANCE LIST

2ND MEETING ON PROPOSED DeKUT SEWERAGE PROJECT EXPANSION TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT NYERI SUBCOUNTY

Venue..... **Date**.....

Time.....

KIMATHI CLUSTER I

S/NO.	NAME OF PARTICIPANT	ORGANIZATION	MOBILE PHONE	SIGN.
1	PATRICK M GICHUHI	HEALTH	0723240329	
2	Rev James Githanga	Religious	0702599009	
3	David Mathenge	G/PUBLIC	8720561841	
4	Michael J Mwai	G/	0722400493	
5	NELSON MBEKENYA	C.G.M	0710868686	
6	NJENGA MBURA	PWD	0728 777573	
7.	GATHAAKA WANDERI	PWD	0720102202	
8.	CHARITY WACHIRA	PWD	0722623966	
9	ESTHER MUIGA	Public	0722217165	
10	SERAH WANJIRU	M+W	0700145204	
11	GRACE NYAGUTHII	Nyumba Kumi	0713677504	
12	Richard Mbiriti	Rvsi	0741063093	
13	JAMES NDIRANGU	Farmer	0723 655 906	
14	Jane NYAKinyua	G/Public	0707472871	Jane
15	MONICA NJOKI	G/Public	0712264420	
16	Joseph Ngunjiri	~~G/Public~~ Youth	0702696998	
17	JOHN NGARI	YOUTH	0796495966	
18	J.M. GITHAE	NEIGHBOURHOOD	0722996687	
19	ELIUD M NGUNJIRI	HEALTH	0723518405	

(2)

ATTENDANCE LIST

2ND MEETING ON PROPOSED DeKUT SEWERAGE PROJECT EXPANSION TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT NYERI SUBCOUNTY

Venue.............................. Date........................

Time.........................

S/NO.	NAME OF PARTICIPANT	ORGANIZATION	MOBILE PHONE	SIGN.
20	MONICA WANGARI	HOSTEL	0721637111	[signature]
21	WAMWGUNAM.G.	HOSTEL	0722771084	[signature]
22	Joyce Gichohi	Youth	0742818577	[signature]
23	MWANGI S. Kimingi	N/A	0722791100	[signature]
24	Charles Mango	CGW(water)	0712272135	[signature]
25	Agnes Gato	Hostel	0724329496	[signature]
26	Samuel Wamunu	Hostel	0722727530	[signature]
27	Dr. Mbaabu Peuel	DeKUT	0724864660	Kaigi

ATTENDANCE LIST

2ND MEETING ON PROPOSED DeKUT SEWERAGE PROJECT EXPANSION TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT NYERI SUBCOUNTY

Venue: EMBASSY MUIGA Date: 02/09/2021

Time: 2pm to 4pm

S/NO.	NAME OF PARTICIPANT	ORGANIZATION	MOBILE PHONE	SIGN.
1.	JULIA MWIHAKI KAMAU	NGAO	0725587703	[signature]
2.	MAGDALINE NJOROGE	NGAO	0726175605	[signature]
3	JOSEPH MAINA	NYUMBA KUMI MASHARI EMBASSY	0723240887	[signature]
4	RAPHAEL W. MBUTHIA	NGAO	0725463879	[signature]
5	AGNES W. KIBOI	COUNTY GOV OF NYERI	0723673354	[signature]
6	NELSON M. MAREKEMYA	C. G. N.	0710868686	[signature]
7.	JUDY W. KINYUA	NYUMBA KUMI NJENGU	0703639086	[signature]
8.	John m. mambo.	OPINION LEADER	0720363736	[signature]
9	HILLARY M. WAMBUGU	Njengu Slac welfare	0723-228881	[signature]
10.	MUHIA WANJIKU WANJOHI	Maendeleo Ya Wanawake	0712.036020	[signature]
11	Teresa Wanjiku M.	maendeleo ya W.	0721756148	[signature]
12	JOHN WANJOHI NGATIA	HT NJENGU PRY	0721583156	[signature]
13	Benson mugo	Youths leader KCI	0705491756	[signature]
14	ESTHER NJAMBI THAINI	MAENDELEO W. PCEA WOMAN GUILD	0724832557	[signature]
15	Mary wanjiru	Embassy Nyumba Kumi	0727208662	[signature]
16	RAHAB WANJIKU	youth cousellor	0727275902	[signature]
17	YOSHUA MUCHEKE	youth leader-KU	0726696180	[signature]
18	ANASTACIA WANGUI K.	NJUMBA KUMI NJENGU	0727622754	[signature]
19	SIMON NGURE MWANGI	BUSINESS	0721167750	[signature]
20	ERASTUS C MATUTO	PHO	0716533579	[signature]
21.	BRIAN T. CHEPKWONY	ACC KIENI WEST	0715990480	[signature]

	ATTENDANCE REGISTER	Page 2 of 6

SUBJECT: 3RD MEETING ON PROPOSED DeKUT SEWERAGE PROJECT EXPANSION TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION

DATE: 3RD SEPTEMBER 2021 AT 9.00 AM

S/NO	NAME	ORGANIZATION	CONTACT	SIGNATURE
8.	CHARLES MARECH	CCO (Water & Irrigation Dept)	0712272135	
9.	ROSELINE WAIRIMU	INTERIOR	0720659471	
10.	JUDITH H. MAKURA	KONHA	0726656410	
11.	JOSEPH M. KIHIA	NGAO	0726708059	
12.	Lilianne Kamau	TWDA	0721783196	
13.	Jemimah Muia	TNWDA	0702393355	
14.	IRENE MUTAHI	TNWDA	0712792260	

Revision	00	

SUBJECT: 3RD MEETING ON PROPOSED DeKUT SEWERAGE PROJECT EXPANSION TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION

DATE: 3RD SEPTEMBER 2021 AT 9.00 AM

S/NO	NAME	ORGANIZATION	CONTACT	SIGNATURE
15.	MERCY NJERI KIHUNGU	TAWWDA	0706925442	
16.	Brian Mugambi Karanja	Nyewasco	0724960420	
17.	Lucy W. Njuguna	WRA	0722444074	
18.	Patricia Musau	WRA	0721935434	
19.	Cllr Albert Mwai	NYERI TOWN MPs OFFICE	0720794707	
20.	ROBERT CHELUGET	Brookside	0721388355	
21.	HANNAH N. KAMAU	DeKUT	0721555180	

Revision	00	

TANA WATER WORKS DEVELOPMENT AGENCY	**ATTENDANCE REGISTER**	Page 4 of 6

SUBJECT: 3RD MEETING ON PROPOSED DeKUT SEWERAGE PROJECT EXPANSION TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION

DATE: 3RD SEPTEMBER 2021 AT 9.00 AM

S/NO	NAME	ORGANIZATION	CONTACT	SIGNATURE
22.				
23.	Mbote Pearl K.	DeKUT	0724864660	Pearl
24.				
25.				
26.				
27.				
28.				

1ST MEETING ON PROPOSED EXPANSION OF DeKUT SEWERAGE PROJECT TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT CHAKA CHIEF'S CAMP, NYERI COUNTY ON 01.09.2021 AT 09:04 AM

In Attendance:

Eng. Kamunyu Kahenya-	Engiconsult Consulting Engineers Limited
Eng. Joseph Muchiri-	Engiconsult Consulting Engineers Limited
Rosylind Wairimu-	Assistant County Commissioner
Stephen Macharia-	MCA office Representative
Charles Mangi-	CEC of Water Representative, CGN
Dan Mbingo-	Prof. Ngugi and Associates

Stakeholders in Attendance:

As per the attendance sheet

Agenda

1. Introduction
2. Project Briefing
3. Plenary
4. A.O.B

Minute No.	Details	Response/Action
1.00	Introduction The meeting started with an introductory brief from Engineer Kahenya and the Assistant County Commissioner Madam Rosylind Wairimu thanked all the stakeholders for turning up for the meeting and introduced his team to the local community in attendance.	
2.0	Briefing Engineer Muchiri informed the stakeholders that the TWWDA wish to expand the sewer services to the Chaka community through connection to the sewer line as well as wastewater treatment facility. He described the activities that will follow and the benefits of the project in enhancing the local land utilization for other productive uses that do not interfere with their source of livelihood- He highlighted the other potential benefits	

	that may accrue from the project like improving aesthetic value and likely increase of land rates The aim of the meeting was to create awareness and also gather comments from the local community to ensure acceptability and support from the onset of this project This is to ensure that all stakeholders that are directly and indirectly affected by the project are safe of any environmental hazards that they feel the project could bring about. He also noted that the Kenyan Constitution 2010 and the SEIA process greatly emphasizes on Public Participation. He added that each person's views will be captured and all questions pertaining the project shall be answered accordingly. He continued saying that he had a set of questionnaires which, through his guidance, needed to be filled by each person in attendance and the report shall be submitted to National Environmental Management Authority (NEMA) for approval and subsequent issuance of EIA license.	
3.0	Plenary	
3.01	Gladys Njoki, wondered whether the project will utilize the local idle youth when the actual work activities start. He said if the work can be done by locals, they will look to be given priority for the jobs.	Engineer Kahenya assured them of the proper workmanship under his watch and that he shall ensure all the constructions will be done by local casuals unless it is special skills that may not be available.
3.02	Peter Ngure feared for contamination of surface water resources from wastes emanating from construction wastes and leakage of machines and equipment	Dan Mbingo assured him of proper containment of wastes from the excavations and installation of the pipes so that they do not find their way into water bodies and cause pollution.

2ND MEETING ON PROPOSED EXPANSION OF DeKUT SEWERAGE PROJECT TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT NYARIBO DEPUTY COUNTY COMMISSIONER OFFICE, NYERI COUNTY ON 01.09.2021 AT 2:04 PM

In Attendance:

Eng. Kamunyu Kahenya-	Engiconsult Consulting Engineers Limited
Eng. Joseph Muchiri-	Engiconsult Consulting Engineers Limited
Nelson Mbekenya-	Assistant County Commissioner
Hon. Margret Muthoni-	MCA
Pauline Kagathi-	Maendeleo ya Wanawake Representative
Dan Mbingo-	Prof. Ngugi and Associates

Stakeholders in Attendance:

As per the attendance sheet

Agenda

1. Introduction
2. Project Briefing
3. Plenary
4. A.O.B

Minute No.	Details	Response/Action
1.00	Introduction The meeting started with an introductory brief from Engineer Kahenya and the Assistant County Commissioner Mr. Nelson Mbekenya thanked all the stakeholders for turning up for the meeting and introduced his team to the local community in attendance.	
2.0	Briefing Engineer Muchiri informed the stakeholders that the TWWDA wish to expand the sewer services to the Chaka community through connection to the sewer line as well as wastewater treatment facility. He described the activities that will follow and the benefits of the project in enhancing the local land utilization for other productive uses that do not interfere with their source of livelihood- He	

3.03	Patrick Kanyi sought to know whether there will be compensation on loss of land use in areas where way leave will be required from private land	Eng. Kahenya elaborated that such benefits may accrue as per the set down procedures but it will be a rare occurrence as mostly the wayleaves are found next to public roads. This may only be occasioned by challenges of wastewater flowing by gravity.
4.0	A.O.B There being no other business, all stakeholders were given copies of questionnaires and with assistance of our assigned enumerators. They filled and handed them back to him. The meeting ended at 1.10pm	

Signed:

Secretary.....

Date...05/09/2021...

Chairman.....

Date...05/09/2021

	highlighted the other potential benefits that may accrue from the project like improving aesthetic value and likely increase of land rates The aim of the meeting was to create awareness and also gather comments from the local community to ensure acceptability and support from the onset of this project This is to ensure that all stakeholders that are directly and indirectly affected by the project are safe of any environmental hazards that they feel the project could bring about. He also noted that the Kenyan Constitution 2010 and the SEIA process greatly emphasizes on Public Participation. He added that each person's views will be captured and all questions pertaining the project shall be answered accordingly. He continued saying that he had a set of questionnaires which, through his guidance, needed to be filled by each person in attendance and the report shall be submitted to National Environmental Management Authority (NEMA) for approval and subsequent issuance of EIA license.	
3.0 3.01 3.02	<u>Plenary</u> Daniel Wang'ombe wondered whether the project will utilize the local idle youth when the actual work activities start. He said if the work can be done by locals, they will look to be given priority for the jobs. Pastor Stephen Gitonga feared for contamination of surface water resources from wastes emanating from construction wastes, leakage of generator and even overflow of holding tanks	Engineer Kahenya assured them of the proper workmanship under his watch and that he shall ensure all the constructions will be done by local casuals unless it is special skills that may not be available. Dan Mbingo assured him of proper containment wastes from the installation of the Wastewater treatment plant will be adequately designed to provide sufficient holding volumes that ensure there is

	Agnes Mucheni sought to know whether overflow or Leakage of sewer to the environment in case of blockages causing bad odor to neighboring communities	adequate time to correct any occurrence that may render the facility unable to be used for even a week. Dan Mbingo assured the residents that there shall be an emergency response plan as a deliberate effort in reduction in pollution to surface water sources running within the project areas
4.0	A.O.B There being no other business, all stakeholders were given copies of questionnaires and with assistance of our assigned enumerators. They filled and handed them back to him. The meeting ended at 5.10pm	

Signed:

Secretary.....

Date...05/09/2024

Chairman.....

Date...05/09/2024

3RD MEETING ON PROPOSED EXPANSION OF DeKUT SEWERAGE PROJECT TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT DEDAN KIMATHI UNIVERSITY HALL, NYERI COUNTY ON 02.09.2021 AT 0910 HOURS

In Attendance:

Eng. Kamunyu Kahenya-	Engiconsult Consulting Engineers Limited
Eng. Joseph Muchiri-	Engiconsult Consulting Engineers Limited
Nelson Mbekenya-	Assistant County Commissioner
Dr. Mbote Paul-	DeKUT
Reverend James Githaga-	Religion Representative
Dan Mbingo-	Prof. Ngugi and Associates

Stakeholders in Attendance:

As per the attendance sheet

Agenda

1. Introduction
2. Project Briefing
3. Plenary
4. A.O.B

Minute No.	Details	Response/Action
1.00	Introduction The meeting started with an introductory brief from Engineer Kahenya and the Assistant County Commissioner Mr. Nelson Mbekenya thanked all the stakeholders for turning up for the meeting and introduced his team to the local community in attendance.	
2.0	Briefing Engineer Muchiri informed the stakeholders that the TWWDA wish to expand the sewer services to the Chaka community through connection to the sewer line as well as wastewater treatment facility. He described the activities that will follow and the benefits of the project in enhancing the local land utilization for other productive uses that do not interfere with their source of livelihood- He	

	highlighted the other potential benefits that may accrue from the project like improving aesthetic value and likely increase of land rates The aim of the meeting was to create awareness and also gather comments from the local community to ensure acceptability and support from the onset of this project This is to ensure that all stakeholders that are directly and indirectly affected by the project are safe of any environmental hazards that they feel the project could bring about. He also noted that the Kenyan Constitution 2010 and the SEIA process greatly emphasizes on Public Participation. He added that each person's views will be captured and all questions pertaining the project shall be answered accordingly. He continued saying that he had a set of questionnaires which, through his guidance, needed to be filled by each person in attendance and the report shall be submitted to National Environmental Management Authority (NEMA) for approval and subsequent issuance of EIA license.	
3.0	Plenary	
3.01	Joseph Ngujiri sought considerations of locals for any project activities that may come with the project. He said if the work can be done by locals, they will like to be considered.	Eng. Kahenya assured them of the proper workmanship under his watch and that he shall ensure all the constructions will be done by local casuals unless it is special skills that may not be available.
3.02	Monica Wangari feared for contamination of surface water resources from wastes	Dan Mbingo assured him of proper containment wastes

4TH MEETING ON PROPOSED EXPANSION OF DeKUT SEWERAGE PROJECT TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT EMBASSY, NYERI COUNTY ON 02.09.2021 AT 1410 HOURS

In Attendance:

Eng. Kamunyu Kahenya-	Engiconsult Consulting Engineers Limited
Eng. Joseph Muchiri-	Engiconsult Consulting Engineers Limited
Brian Chepkwony-	Assistant County Commissioner
Erastus Matoto-	Public Health Officer
Annastacia Wanjiku-	Nyumba Kumi
Dan Mbingo-	Prof. Ngugi and Associates

Stakeholders in Attendance:

As per the attendance sheet

Agenda

1. Introduction
2. Project Briefing
3. Plenary
4. A.O.B

Minute No.	Details	Response/Action
1.00	Introduction The meeting started with an introductory brief from Engineer Kahenya and the Assistant County Commissioner Mr. Brian Chepkwony thanked all the stakeholders for turning up for the meeting and introduced his team to the local community in attendance.	
2.0	Briefing Engineer Muchiri informed the stakeholders that the TWWDA wish to expand the sewer services to the Chaka community through connection to the sewer line as well as wastewater treatment facility. He described the activities that will follow and the benefits of the project in enhancing the local land utilization for other productive uses that do not interfere with their source of livelihood- He highlighted the other potential benefits	

	emanating from construction wastes, leakage of generator and even overflow of holding tanks	from the installation of the Wastewater treatment plant will be adequately designed to provide sufficient holding volumes that ensure there is adequate time to correct any occurrence that may render the facility unable to be used for even a week.
3.03	Patrick Kanyi sought to know whether there will be compensation on loss of land use in areas where way leave will be required from private land	Eng. Kahenya elaborated that such benefits may accrue as per the set down procedures but it will be a rare occurrence as mostly the wayleaves are found next to public roads. This may only be occasioned by challenges of wastewater flowing by gravity.
4.0	A.O.B There being no other business, all stakeholders were given copies of questionnaires and with assistance of our assigned enumerators. They filled and handed them back to him. The meeting ended at 12.30.00pm	

Signed:

Secretary.....

Date.....05/09/2024.....

Chairman.....

Date.....05/09/2024

	that may accrue from the project like improving aesthetic value and likely increase of land rates The aim of the meeting was to create awareness and also gather comments from the local community to ensure acceptability and support from the onset of this project This is to ensure that all stakeholders that are directly and indirectly affected by the project are safe of any environmental hazards that they feel the project could bring about. He also noted that the Kenyan Constitution 2010 and the SEIA process greatly emphasizes on Public Participation. He added that each person's views will be captured and all questions pertaining the project shall be answered accordingly. He continued saying that he had a set of questionnaires which, through his guidance, needed to be filled by each person in attendance and the report shall be submitted to National Environmental Management Authority (NEMA) for approval and subsequent issuance of EIA license.	
3.0	Plenary	
3.01	Julia Kamau sought considerations of locals for any project activities that may come with the project. He said if the work can be done by locals, they will like to be considered.	Eng. Kahenya assured them of the proper workmanship under his watch and that he shall ensure all the constructions will be done by local casuals unless it is special skills that may not be available.
3.02	John Mambo feared for contamination of surface water resources from wastes emanating from construction wastes and	Dan Mbingo assured him of proper containment wastes from the installation of the

	soil debris and even overflow of holding tanks during the operational periods	Wastewater treatment plant will be adequately designed to provide sufficient holding volumes that ensure there is adequate time to correct any occurrence that may render the facility unable to be used for even a week.
3.03	Simon Mwangi wanted to know whether there shall be compensation on loss of land use in areas where way leave will be required from private land and whether the rates to be paid shall be pegged on some document or agreeable formula	Eng. Kahenya elaborated that such benefits may accrue as per the set down procedures but it will be a rare occurrence as mostly the wayleaves are found next to public roads. This may only be occasioned by challenges of wastewater flowing by gravity.
4.0	A.O.B There being no other business, all stakeholders were given copies of questionnaires and with assistance of our assigned enumerators. They filled and handed them back to him. The meeting ended at 4.30.00pm	

Signed:

Secretary.....

Date...03/09/2021

Chairman.....

Date...03/09/2021

5TH MEETING ON PROPOSED EXPANSION OF DeKUT SEWERAGE PROJECT TO FULFILL REQUIREMENTS FOR PUBLIC PARTICIPATION AND CONSULTATION AT TANA WATER WORKS DEVELOPMENT AGENCY IN NYERI OFFICE CONFERENCE ROOM, NYERI COUNTY ON 03.09.2021 AT 0920 HOURS

In Attendance:

Eng. Erastus Waweru-	TWWDA
Eng. Kamunyu Kahenya-	Engiconsult Consulting Engineers Limited
Eng. Joseph Muchiri-	Engiconsult Consulting Engineers Limited
Nelson Mbekenya-	Assistant County Commissioner
Dr. Mbote Paul-	DeKUT
Patricia Musau-	Water Resources Authority
Dan Mbingo-	Prof. Ngugi and Associates

Stakeholders in Attendance:

As per the attendance sheet

Agenda

1. Introduction
2. Project Briefing
3. Plenary
4. A.O.B

Minute No.	Details	Response/Action
1.00	Introduction The meeting started with an introductory brief from Engineer Kahenya and the Engineer Erastus Waweru thanked all the agency representatives for turning up for the meeting and members were given an opportunity to introduce themselves and the mandate of their institutions.	
2.0	Briefing Engineer Muchiri informed the stakeholders that the TWWDA wish to expand the sewer services to the Kimathi/Chaka community through connection to the sewer line as well as wastewater treatment facility. He described the activities that will follow	

	and the benefits of the project in enhancing the local land utilization for other productive uses that do not interfere with their source of livelihood- He highlighted the other potential benefits that may accrue from the project like improving aesthetic value and likely increase of land rates The aim of the meeting was to create awareness and also gather comments from the institutional representatives to ensure acceptability and support from the onset of this project This is to ensure that all stakeholders that are directly and indirectly affected by the project are safe of any environmental hazards that they feel the project could bring about. He also noted that the Kenyan Constitution 2010 and the SEIA process greatly emphasizes on Public Participation. He added that each person's views will be captured and all questions pertaining the project shall be answered accordingly. He continued saying that he had a set of questionnaires which, through his guidance, needed to be filled by each person in attendance and the report shall be submitted to National Environmental Management Authority (NEMA) for approval and subsequent issuance of EIA license.	

3.0	Plenary	
3.01	Robert Cheluget wanted to understand the flow by gravity of wastewater and how the Engineer will navigate the challenges of gravitational flow in the Brookside Company premises	Eng. Muchiri elaborated the flow diagram and they were to consult each other further as the design is likely to affect the design of the operations.
3.02	Patricia Musau expressed caution and informed the consultant on the need to exhaust the water quality regulations as per the Water Act 2016 so that they come up with a document that covers the current scope of water acts, schedules and regulations.	Dan Mbingo assured him that all the regulations had been considered and the relevant ones were incorporated and they could not all be captured in the brief meetings but they will be in the main report.
3.03	Hannah Kamau of DeKUT was concerned about the modalities of expanding the main sewerage treatment plant in DeKUT and the possibility of NYEWASCO taking over its operations. She was to consult further with the management of DeKUT although DeKUT is in the Service Provision Area of NYEWASCO	Eng. Erastus Waweru explained the modalities for the expansion and the need for a dedicated personnel to handle the expanded capacity and granted Hannah time to discuss with DeKUT management.
4.0	A.O.B There being no other business, all stakeholders were given copies of questionnaires and with assistance of our assigned enumerators. They filled and handed them back to him. The meeting ended at 12.30.00pm	

Signed:

Secretary.....

Date 05/09/2021

Chairman .....

Date 05/09/2021

FORM 7

(r.15(2))

mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/17516

Application Reference No: NEMA/EIA/EL/22744

M/S **GEORGE NGUGI NJUGUNA**
(individual or firm) of address

P.O. Box 26442 NAIROBI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **0148**

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

Issued Date: **5/5/2022**

Expiry Date: **12/31/2022**

Signature.....

(Seal)

Director General
The National Environment Management Authority

P.T.O.

Conditions For Licensing

Conditions For Licensing

1. This license expires on 31st December of the year it is issued.
2. The expert shall comply with code of practice and Professional Ethics for EIA/EA experts.
3. The expert shall comply with the attached conditions.

General Conditions

1. All Environment Experts certified and registered in the accordance with the provision of relevant Regulations, may establish professional associations to complement and implement the objectives of the Code of Practice.
2. An Expert shall act professionally, accurately, fairly and in an unbiased manner in undertaking his work.
3. The Director General, in consultation with relevant stakeholders, may from time to time issue guidelines for the proper conduct of registered Environmental Impact and Audit Experts.
4. Every Environmental Expert shall each year attend at least two relevant seminars organized by the authority for the purposes of improving the professional expertise of its members.
5. No Expert shall exploit the inexperience, lack of understanding, illiteracy or other lack of technical knowledge in environmental matters of a project proponent, owner or the public, for his personal gain.

Receiving Instructions

1. No Environmental Expert shall act for any project proponent unless he has received written instructions form such project proponent or his authorized agent.
2. An Environmental Expert shall not unreasonably delay the carrying out of instructions received from the project proponent of his authorized agent.
3. An Environmental Expert shall discharge his responsibilities to the project proponent with due diligence and integrity.
4. An Environment Expert may terminate a contract on carrying out an environmental impact assessment or audit as stipulated in section 8 of the Code of Practice and Professional Ethics of EIA/EA Experts.

Carrying out an EIA/EA

1. An Environmental Expert shall follow relevant regulations or guidelines and directives issued by the Authority.
2. As Environmental Expert shall take due care and diligence to collect the relevant data to address the significant environmental issues in the various stages of the assessment or audit process and fully acknowledge the source of any data that is not the result of his findings.
3. Environmental Expert shall consult widely with all the relevant agencies, stakeholders, interested parties and the general public on all the matters that likely to affect them.
4. An Environmental Impact Assessment or Audit Report shall be based on the Terms of Reference of the Assignment and shall include all the matters relevant to the findings of the study, all the relevant matters are required by statutory provisions, and must be guided by professional standards and judgments.

Responsibility of Lead Environmental Experts

1. (1) An Environmental Lead Expert shall be responsible for the documents prepared by him/her on behalf of the project proponent.
   (2) An Environmental Expert shall guide the proponent throughout the preparation of the environmental impact assessment and/or environmental audit, and/or during implementation of the Environmental Management Plan.
   (3) An Environmental Expert shall disclose to a client or employer any relationships of conflicting or competing interests that may influence his judgment prior to the carrying out of work.

Misconduct of Environmental Experts

1. An Environmental Expert who contrivances a provision of Code of Practice and Professional Ethics shall be deemed to heve committed professional misconduct and shall be subject to disciplinary action by the Authority as appropriate and as stipulated in the Code of Practice and Professional Ethics of Environmental Experts.

Disciplinary Action

1. Where an Environmental Expert is found to have committed professional misconduct by the Environmental Experts' Advisory Committee/Authority shall be punished as stated under section 19 of the code of Practice and Professional Ethics.

Appeals

1. (1) An Expert aggrieved by the decision of the Authority may apply for the review of such decision in the High Court.
   (2) If an application for judicial review shall not have been fined at the expiry of 30 days from the date of the decision of the Authority, the director General may publicize the disciplinary action taken against the Expert.

TANA WATER WORKS DEVELOPMENT AGENCY

MAJI HSE BADEN POWELL ROAD
P.O. BOX 1292 – 10100 NYERI
Tel: 061-2032282 Fax: 061-2034118
Email: info@tanawwda.go.ke
Website: www.tanawwda.go.ke

TWWDA/PRJ/6/150VOL.I/ (81) **16th February, 2022**

Engiconsult Ltd,
1st Floor, New Waumini House, Westlands,
P.O Box 42256-00100,
Nairobi, Kenya.
Email: info@engiconsult.co.ke

KABIRUINI AND CHAKA SEWERAGE PROJECT- REQUEST FOR INFORMATION RELATED TO ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT

Reference is made to your letter Ref. ECL071/TWWDA/21/10 dated 2nd February 2022 on the above subject matter.

Please find the following documents enclosed;

1. Copies of Tana Water Works Development Agency PIN Certificate and Gazette Notice establishing the Agency
2. Copy of Dedan Kimathi University of Technology Title Deed

In regard to request for **NO OBJECTION** letters to lay sewer infrastructure along and across roads under the purview of KeNHA, KeRRA and Nyeri County, applications will be sought upon completion and submission of the project's designs to include the following information;

a. Details of road classification and coordinates of crossing points in form of a general layout map
b. Plan and profile drawings with detailed method statements of road crossings
c. Duly filled application forms

Suffice to note that the said institutions gave an undertaking to expeditiously process applications during key stakeholders meeting held on Friday 27th August 2021 at TWWDA Resource Center.

Additionally, please take note that the project name was changed to **KABIRUINI AND CHAKA SEWERAGE PROJECT** following a TWWDA management meeting and resolution. To ensure that Environmental Impact Assessment license issued by National Environment Management Authority (NEMA) reflects this change, kindly liaise with NEMA and advise us on documentation to be provided as a matter of urgency.

Eng. Philip Gichuki
CHIEF EXECUTIVE OFFICER

Encl.

KENYA REVENUE AUTHORITY

www.kra.go.ke

PIN Certificate

For General Tax Questions
Contact KRA Call Centre
Tel: +254 (020) 4999 999
Cell: +254(0711)099 999
Email: callcentre@kra.go.ke

Certificate Date : 11/09/2019

Personal Identification Number

P051171635M

This is to certify that taxpayer shown herein has been registered with Kenya Revenue Authority

Taxpayer Information

Taxpayer Name	TANA WATER WORKS DEVELOPMENT AGENCY
Email Address	TANAWATERBOARD@YAHOO.COM

Registered Address

L.R. Number :	**Building :** TANA WATER
Street/Road : BORDEN POWELL	**City/Town :** NYERI
County : Nyeri	**District :** Nyeri Central District
Tax Area : Nyeri Town	**Station :** PUBLIC SECTOR DIVISION
P. O. Box : 1292	**Postal Code :** 10100

Tax Obligation(s) Registration Details

Sr. No.	Tax Obligation(s)	Effective From Date	Effective Till Date	Status
1	Value Added Tax (VAT)	22/05/2010	N.A.	Active
2	Income Tax - Company	13/05/2005	N.A.	Active
3	Income Tax - PAYE	01/08/2005	N.A.	Active

The above PIN must appear on all your tax invoices and correspondences with Kenya Revenue Authority. Your accounting end month is June unless a change has been approved by the Commissioner-Domestic Taxes Department. The status of Tax Obligation(s) with 'Dormant' status will automatically change to 'Active' on date mentioned in "Effective Till Date" or any transaction done during the period. This certificate shall remain in force till further updated.

LEGAL NOTICE NO. 27

THE WATER ACT

(*No.* 43 *of* 2016)

COMMENCEMENT OF SECTION 152

IN EXERCISE of the powers conferred by section 1 of the Water Act, 2016, the Cabinet Secretary for Water and Sanitation appoints the 3rd May, 2019 as the date on which section 152 of the Water Act, 2016, in so far as it relates to Water Service Boards, shall come into operation.

Date the 26th April, 2019.

SIMON CHELUGUI,
Cabinet Secretary for Water and Sanitation.

LEGAL NOTICE NO. 28

THE WATER ACT

(*No.* 43 *of* 2016)

ESTABLISHMENT OF WATER WORKS DEVELOPMENT AGENCIES

IN EXERCISE of the powers conferred by section 65 (1) of the Water Act, 2016, the Cabinet Secretary for Water and Sanitation establishes the following Water Works Development Agencies—

Water Works Development Agency (WWDA)	*Geographical Area of Jurisdiction*
Coast Water Works Development Agency	Mombasa, Kwale, Taita Taveta, Kilifi, Lamu and Tana River Counties
Athi Water Works Development Agency	Nairobi, Kiambu and Murang'a Counties
Northern Water Works Development Agency	Garissa, Wajir, Isiolo, Mandera, Marsabit, Samburu and Laikipia Counties
Lake Victoria South Water Works Development Agency	Kisii, Nyamira, Kericho, Bomet, Migori, Homa Bay, Kisumu and Siaya Counties
Lake Victoria North Water Works Development Agency	Kakamega, Vihiga, Busia, Bungoma, Trans-Nzoia, Uasin Gishu and Nandi Counties

Water Works Development Agency (WWDA)	*Geographical Area of Jurisdiction*
Rift Water Works Development Agency	Turkana, West Pokot, Baringo, Nakuru, Nyandarua, Elgeyo Marakwet and Narok Counties
Tana Water Works Development Agency	Kirinyaga, Nyeri, Meru, Embu and Tharaka Nithi Counties
Tanathi Water Works Development Agency	Kitui, Makueni, Machakos and Kajiado Counties

Date the 26th April, 2019.

SIMON CHELUGUI.
Cabinet Secretary for Water and Sanitation.

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REPUBLIC OF KENYA

THE REGISTRATION OF TITLES ACT

(*Chapter 281*)

GRANT NO. I.R. 31894

ANNUAL RENT: Shs.72/-

TERM: 99 years from 1.12.1976

KNOW ALL MEN BY THESE PRESENTS that the PRESIDENT OF THE REPUBLIC OF KENYA hereby GRANT unto KIMATHI INSTITUTE OF TECHNOLOGY REGISTERED TRUSTEES a body corporate under the Land (Perpetual Succession Act(Cap.286) P.O. Box [illegible], [illegible].

(hereinafter called "the Grantee") all that piece of land situate in Nyeri Municipality in the Nyeri

Nought District containing by measurement Eight/decimal six seven (8.67) hectares

/acre/ or thereabouts that is to say Land Reference Number 12[illegible]

which said piece of land with the dimensions abuttals and boundaries thereof is delineated on the plan annexed hereto and more particularly on Land Survey Plan Number 104239 deposited in the Survey Records Office at Nairobi To HOLD for the term of ninety-nine (99) Years

from the first day of December One thousand nine hundred and seventy-six SUBJECT to (*a*) the payment in advance on the first day of January in each year of the annual rent of Shillings seventy-two (Shs.72/-)

(*b*) the provisions of the Government Lands Act (Chapter 280) (c) the following special conditions (namely):-

GPK 1995—300—[illegible]

SPECIAL CONDITIONS.

1. No further buildings shall be erected on the land nor shall additions or external alterations be made to any buildings otherwise than in conformity with plans and specifications previously approved in writing by the Commissioner of Lands. The Commissioner shall not give his approval unless he is satisfied that the proposals are such as to develop the land adequately and satisfactorily.

2. The Grantee shall maintain in good and substantial repair and condition all buildings at any time erected on the land.

3. The Land and buildings shall only be used for the education purposes and one house for the accommodation of Head Teacher employed in connection therewith.

4. If the School erected on the land shall cease to function as such under the provisions of the Education Act 1952 then the term hereby created shall ipsofacto also be determined and the land be deemed automatically to have reverted to the President of the Republic of Kenya as from the date of such cessation without the necessity of any formal surrender thereof.

5. The Grantee shall not subdivide the land.

6. The Grantee shall not sell, transfer, sublet, charge or part with the possession of the land or any part thereof or any buildings thereon.

7. The Grantee shall pay to the Commissioner of Lands on demand such sum as the Commissioner may estimate to be the proportionate cost of constructing all roads and drains severe serving or adjoining the land and shall on completion of such construction and the ascertainment of the actual proportionate cost either pay on demand or be refunded the amount paid as aforesaid.

8. The Grantee shall from time to time pay to the Commissioner of Lands on demand such proportion of the cost of maintaining all roads and drains serving or adjoining the land as the Commissioner may assess.

9. Should the Commissioner of Lands at any time require the said roads to be constructed to a higher standard the grantee shall pay to the Commissioner on demand such proportion of the cost of such construction as the Commissioner may assess.

10. The Grantee shall pay such rates, taxes, charges, duties, assessments or outgoings of whatever description as may be imposed charged or assessed by the Government or Local Authority upon the land or buildings erected thereon including any contribution or other sum paid by the President of the Republic of Kenya in lieu thereof.

11. The President of the Republic of Kenya or such person or authority as may be appointed for the purpose shall have the right to enter upon the land and lay and have access to water mains, service pipes and drains, telephone or telegraph wires and electric mains of all descriptions, whether overhead or underground, and the grantee shall not erect any building in such a way as to cover or interfere with any existing alignments of main or service pipes or telephone or telegraph wires and electric mains.

12. Notwithstanding anything to the contrary contained herein or implied by the said Lands Act the grantee shall, on receipt of six months' notice in writing in that behalf, surrender all or any part of the land required for public purposes without payment of any compensation save in respect of such of the approved buildings as may have to be evacuated or demolished.

[illegible] 14th [illegible] March [illegible]

[illegible]

PRESENTED 19 MAR 1978 LAND TITLES REGISTRY

[illegible]

31894/1

15th March / 78

11.20 A.M.

[illegible]

[illegible] 17th [illegible] May [illegible]

[illegible]

Bahati,
Deputy Principal Registrar of Titles.

31894/2

19th May / 78
11.15 Am

[illegible]

Charge to Kenya Commercial Bank Limited

3

807 19th May 1978

THE FOLLOWING INSTRUMENT HAS BEEN REGISTERED AGAINST THE TITLE

Further charge to Kenya Commercial Bank Limited

Subject to No. 3 above

Registrar

Presentation No. 4496 Date of Registration 15-9-1980 Registrar

(5) THE FOLLOWING INSTRUMENT HAS BEEN REGISTERED AGAINST THE TITLE

Discharge of Charge no 3 and 4 above

Registrar

Presentation No. 66 Date of Registration 1-10-2018

By Virtue of Legal Notice No. 162 of F. F. Atieno 208 2007. all rights, liabilities and assets held by or by any body on behalf of the Kimathi Institute of Technology were automatically and fully transferred to Kimathi University College.

By virtue of University Act, Act C. S. Maina 735 No. 42 of 2012 and the Charter issued on 4th December 2012, all rights, liabilities and assets held on behalf of Kimathi University college of Technology are automatically and fully transferred to Dedan Kimathi University of Technology.

60

REPUBLIC OF KENYA

THE REGISTRATION OF TITLES ACT

(CHAPTER 281)

GRANT: Number I.R. 35107

F R E E H O L D

KNOW ALL MEN BY THESE PRESENTS that THE PRESIDENT OF THE REPUBLIC OF KENYA on behalf of the Government of the Republic of Kenya hereby GRANTS Unto THE REGISTERED TRUSTEES OF KIKUYU INSTITUTE OF TECHNOLOGY a body corporate duly established under the Land (Perpetual Succession) Act (Chapter 256) and of Nairobi (Post Office Box Number 46669) (hereinafter called "the Grantee") ALL THAT piece of land situate in NYERI MUNICIPALITY in the Nyeri District containing by measurement two hundred sixty six decimal seven (266.7) hectares or thereabouts that is to say Land Reference Number 12548 which said piece of land with the dimensions abuttals and boundaries thereof is delineated and edged red on the Plan annexed hereto and more particularly on Land Survey Plan Number 109204 deposited in the Survey Records Office at Nairobi TO HOLD the same in fee simple SUBJECT to (a) The Government Lands Act (Chapter 280) and (b) the Notification of Public Roads and road of access registered in I. R. 14912/2 ; I. R. 15005/2 and in Volume H.16 Folio 16/16 (c) Caveats by E.A.P. & Lighting registered in I. R. 15005/5; I. R. 14912/5 and in Volume H.16 Folio 16/18 and (d) the following Special Conditions (namely):-

SPECIAL CONDITIONS

The land shall be used for agricultural and educational purposes.

IN WITNESS WHEREOF I, JAMES RAYMOND KJENGA the Commissioner of Lands have by Order of the President hereunto set my hand this 20th day of November One thousand nine hundred and eighty in the presence of:-

REGISTRAR OF TITLES

35107/1

11th February 1981

Further Charge to Standard Chartered Bank Kenya Limited.
Subject to Caveats regd as IR 15005/5 IR 14912/5
and in Vol. A.16 Folio 16/18
and charge no 2 above.
935 264-90

THE FOLLOWING INSTRUMENT HAS BEEN REGISTERED AGAINST THE TITLE

(4) Further Charge to Standard Chartered Bank Kenya Limited Subject to No 2 and 3 above and Caveats regd IR 15005/5, IR 14912/5 and A.16 Folio 16/18

Presentation No. 1165 Date of Registration 26-5-2004 Registrar of Titles

THE FOLLOWING INSTRUMENT HAS BEEN REGISTERED AGAINST THE TITLE

(5) Further Charge to Standard Chartered Bank Kenya limited subject to Nos 2, 3 and 4 above.

Presentation No: 1370 Date of Registration 23.10.2008 Registrar

THE FOLLOWING INSTRUMENT HAS BEEN REGISTERED AGAINST THE TITLE

(6) Discharge of Charges No. 2, 3, 4 & 5 above

Presentation No: 2321 Date of Registration 22-11-2010 Registrar

C. S. Maina 235

By virtue of Legal Notice no. 162 of 2007 all rights, liabilities and assets held by or by any body on behalf of the Kimathi Institute of Technology, were automatically and fully transferred to Kimathi University College.

C. S. Maina 235

By virtue of University Act Act no. 42 of 2012 and the Charter issued on 14th December 2012, all rights, liabilities and assets held on behalf of Kimathi University College of Technology, are automatically and fully transferred to Dedan Kimathi University of Technology

C. S. Maina 235