REPUBLIC OF KENYA

MINISTRY OF LANDS, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT

State Department of Housing and Urban Development

SECOND KENYA INFORMAL SETTLEMENTS IMPROVEMENT PROJECT (KISIP2)

CONSULTANCY SERVICES FOR INFRASTRUCTURE UPGRADING PLANS, DETAILED ENGINEERING DESIGNS AND PREPARATION OF PROCUREMENT DOCUMENTS AND CONSTRUCTION SUPERVISION OF INFRASTRUCTURE IMPROVEMENT WORKS IN SELECTED INFORMAL SETTLEMENTS IN THE COUNTIES OF NAIROBI, KIAMBU, NYANDARUA AND KAJIADO

Contract No: KE-MOTI-295979-CS-QCBS

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
MISRI SETTLEMENT - KIAMBU COUNTY

APRIL, 2024

CLIENT:	**CONSULTANT:**
COUNTY GOVERNMENT OF KIAMBU **P.O. BOX 2341-00900** **KIAMBU**	**WANJOHI MUTONYI CONSULT LTD** **CORNER NGONG /NDEMI ROADS JUNCTION** **P. O. Box 21714 – 00505** **NAIROBI – KENYA** **TEL: +254-20-3876690/1/2** **Email: wancone@yahoo.com**

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Compiled by		
Name	Qualification	Signature/Date
Prof. J.I. Kinyamario	*Registered Lead EIA Expert No. 0134*	*Date: 20th April 2024*
Mr. Elijah K. Mutuango	*Socio-Economist*	*Date: 20th April 2024*

Document Authentication

I, _____on behalf of The Proponent – **County Government of Kiambu, Approve** this Environmental and Social Impact Assessment (ESIA) Project Report for the proposed Kenya Informal Settlements Improvement Project Phase II (KISIP II).

Signed at _____on this _____Day of _____2024

Signature _____

Designation: _____

I, Prof. Jenesio I. Kinyamario, a registered Lead EIA Expert by the National Environment Management Authority (License No. 0134), confirm that the contents of this report are a true representation of the Environmental Impact Assessment of the proposed Kenya Informal Settlements Improvement Project Phase II (KISIP II).

Signed by the Lead of EIA Expert:

Name: Prof. Jenesio I. Kinyamario (NEMA License No. 0134)

Signature: **…….**

20th April, 2024

Date: **……..…….**

ACRONYMS AND ABBREVIATIONS

AMCEN - African Ministerial Conference on the Environment
ARAP - Abbreviated Resettlement Action Plan
CBD - Convention on Biological Diversity
CBOs – Community Based Organisations
CDF – Constituency Development Fund
CITES - Convention on International trade in Endangered Species of Wild Fauna and Flora
CMS - Convention on Migratory Species
EAC - East Africa Community
EMCA - Environmental Management and Coordination Act
EMP – Environmental Management Plan
ERS - Economic Recovery Strategy
ESIA – Environmental and Social Impact Assessment
ESMF - Environmental and Social Management Frameworks
ESMP - Environmental and Social Management Plan
EU - European Union
GoK – Government of Kenya
HIV/AIDS - Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
KES – Kenya Shilling
KISIP - Kenya Informal Settlements Improvement Project
KWS – Kenya Wildlife Service
NEAP - National Environment Action Plan
NEC – National Environment Council
NEPAD - New Partnership for Africa's Development
NGOs – non-governmental organisations
NPEP - National Poverty Eradication Plan
^{o}C – degree Celsius
RAP - Resettlement Action Plan
RPF - Resettlement Policy Framework
SDGs – Sustainable Development Goals
TOR – Terms of Reference
UNCCD - United Nations Convention to Combat Desertification
UNFCC - United Nations Framework Convention on Climate Change
USD – US Dollar
VCT - voluntary counselling and testing
WB – World Bank

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ESIA EXECUTIVE SUMMARY

E1: Introduction

Most urban areas in Kenya are characterized by high population density informal settlements driven by rural-urban migration by a population trying to escape from high poverty levels and in search of employment opportunities in urban areas. It is estimated that about 90% of informal settlements residents pay rent for their houses that are of poor quality and owned by very few landlords. It has not been possible to provide appropriate sanitation, water supply, drainage and solid waste disposal further worsening the environmental conditions. These conditions, coupled with the level of housing are considered poor and are part of the intervention targets under Kenya Informal Settlements Improvement Project Phase II (KISIP II).

Many informal settlements are characterized by: 1) lack of basic services, unplanned and underserved neighbourhoods typically settled by squatters without legal recognition or rights, overcrowding and high population density, poor and impermanent housing conditions and structures, and insufficient living area (three or more people per room), 2) inadequate access to improved water at affordable prices and without extreme effort; improved sanitation to a private or public toilet shared with a reasonable number of people; and other infrastructure services, and 3) less developed infrastructure such as access roads and drainage structures.

E2: Location of Project Area

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground.

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground. Misri is located in the Mabrouke Sub-Location, Limuru East Location, Limuru East Ward and Limuru Sub-County, Kiambu County. GPS Coordinates 1º06’59”S and 36º38’44”E.

E3: Project Objectives

The Government of Kenya has received Credit facility from the International Development Association (IDA) and AFD towards the cost of the Second Kenya Informal Settlements Improvement Project (KISIP 2) and applied part of the credit to procure Consultancy Services for Infrastructure Upgrading Plans, Detailed Engineering Designs and Preparation of Procurement Documents, Resettlement Action Plan (RAP) and Environmental and Social Impact Assessment (ESIA) Reports and Vulnerable and Marginalized Groups Plan (VMGP) where applicable, and Supervision of Construction of Infrastructure Works in selected Informal Settlements in selected counties of Kenya (including Kiambu).

The overall objective of KISIP 2 is to improve access to basic services and tenure security of residents in participating urban informal settlements and strengthen institutional capacity for slum upgrading in Kenya.

This Project, while concentrating on informal settlements, complements existing and past urban upgrades in Kenya that address the urban infrastructure deficit and urban institutional challenges. It supports the Governments’ affordable housing agenda as it seeks to complement the infrastructure demand-side and supply-side operations to improve housing affordability.

E4: Scope of Works

Facilities planned for construction include the following: access roads, walkways, street lights, water lines, sewer lines and drainage channels.
The works shall include but not limited to: -

- Site clearance and earthworks as necessary
- Excavation to remove unsuitable materials
- Filling with approved materials as specified
- Hand packing with approved stone
- Improvement/construction of drainage facilities
- Repairs and/or improvement/construction of footpaths and shoulders
- Laying of asphaltic concrete layer(s) to a consolidated thickness.

The materials for construction of this project include the following;

- Filler material
- Aggregates for sub-base
- Bituminous (Asphaltic) mixes of bitumen and aggregate
- Bitumen (Asphalt)

These materials will be purchased from respective dealers, whereas filler materials and aggregates will be purchased from NEMA licenced quarries and borrow pits in the vicinity that are owned by private dealers or individuals. Bitumen is also purchased from bitumen dealers and purchased in drums.

- Laying and/or replacement of kerbs and channel
- Construction of the road junctions abutting to main roads
- Maintenance of the works during the construction and maintenance periods
- Traffic management through the works and from the works
- Relocation and/or protection of other services including but not limited to electric poles
- Any other works as instructed by the Engineer and/or as specified in this report.
- The settlement has the following planned projects roads, street lights, and drainage works.

Summary of Scope of Works The settlement has the following planned projects roads, street lights, and drainages works.

Road works

Road Name	**Road Length (Metres)**	**Width (m)**
MSR RD01	456	5
MSR RD02	563	5
MSR RD04	30	3
MSR RD04	32	3
MSR RD06	44	3
MSR RD07	36	3
Total Length	1,161	

The **Road works** entail.

- Carriage way of varied widths between 3m to 5m specific to each Alignment
- Pavement structure comprising of;
- **Surfacing:** The surfacing will consist of 50mm Asphalt Concrete Type II.
- **The Base:** 150mm Hand Packed Stone and an overlay of 50mm quarry dust compacted with a vibratory roller to fill in the voids
- **Subbase:** 150mm, Neat Gravel.
- **Sub Grade:** 300mm improved subgrade of S3 quality minimum CBR of 10%, compacted to 100% MDD (T99) in layers of not more than 150mm thickness

The **Drainage system construction works** shall include;

- Cross pipe culverts and access culverts
- Lined rectangular closed drains

Street Lighting Works

The **Street Lighting works** shall comprise of installation of 98 No. integrated solar street lights with the following works being carried out;

- Pad foundation concrete works for mounting of street light column
- Installation of 6m single–arm street lighting round section tapering column from Class C galvanized steel pipe as per the detailed drawings
- Supply and installation of integrated solar street light fittings as per the detailed drawings and specifications

E5: ESIA Methodology

The ESIA applied both qualitative and qualitative research methods to collect relevant data and information and involved both literature review and site visits. A participatory approach that recognizes the importance of all stakeholders, and seeks to incorporate opinions and suggestions of all, especially the intended beneficiaries was adopted. The methodology comprised field visits and data collection from the project area, data analysis and report writing.

E6: The Objectives of the ESIA

The ESIA aims to achieve the following objectives:

1. Identify and analyse environmental issues that may affect the project and the sector.
2. Establish the environmental baseline in the study area, and identify any significant environmental issues (direct/indirect/induced/cumulative).
3. Assess impacts of the project on the environment, and provide for measures to address the adverse impacts by the provision of the requisite avoidance, mitigation and compensation measures.
4. Integrate the environmental issues in the project planning and design.
5. Develop appropriate management plans for implementing, monitoring and reporting of the suggested environmental mitigation and enhancement measures.

E7: Justification for the ESIA

An Environmental and Social Impact Assessment (ESIA) is a process that identifies both negative and positive environmental, economic, and social-cultural impacts of a project. It's done before a project begins, to either give a green light, offer an alternative, or stop it entirely.

In accordance with the EMCA, 1999, all new projects must undergo environmental impact assessment such as to comply with the EIA Regulations. EIA is a legal requirement in Kenya rooted in the constitution. Chapter 69 of the Constitution of Kenya lists obligations in respect of the environment. The state must establish systems of environmental impact assessment, environmental audit, and environmental monitoring. The state must also eliminate processes and activities likely to endanger the environment.
Consequently, the National Assembly of the Republic of Kenya has developed several laws to establish systems and guide the environmental impact assessment process in Kenya. The Environmental Management and Coordination Act (EMCA) 1999 (Cap 387 of the laws of Kenya), Environmental (Impact Assessment and Audit) Regulations 2003, Environmental Management and Coordination Act (Amendment) Act 2015, and Environmental (Impact Assessment and Audit) (Amendment) Regulations 2019, are some of these laws.

An EIA is done before the development or project begins. EIA is carried out by an Environmental Impact Assessment/ Environmental Audit (EIA/EA) expert duly registered and licensed by the National Environment Management Authority (NEMA).

E8: Terms of Reference (TOR) for the ESIA

The main objective of the project will be to improve the quality of life in this informal settlement and redress the existing inequalities through provision of reliable and efficient infrastructure such as roads, drainage and street lights to the residents. This ESIA process was commissioned to produce and subsequently implement an environmental impact assessment report for the proposed project.

E9: Summary of Anticipated Impacts and their Mitigation Measures

Table 1 - Summary of Impacts and Mitigation Measures

Environmental/Socio-economic impact	Mitigation Measure
Pre-construction Phase	
Land Disruption	Early identification of impacts may involve land disruption, leading to temporary or permanent displacement of residents during the pre-construction phase.
Social Discontent	The assessment level determination may generate social discontent among the community, as they become aware of potential changes and disruptions to their living conditions
Uncertainty	Compliance with safeguard policies may create uncertainty among stakeholders, including residents and project developers, as they await confirmation of the project's eligibility and adherence to standards.
Potential Livelihood Disturbance	Viability assessment, even before feasibility studies, could lead to concerns about potential disturbances to livelihoods, especially if the community relies on existing infrastructure that might be affected.
Public Opposition	The integration of screening outcomes into early project development may face public opposition as stakeholders may not

Environmental/Socio-economic impact	Mitigation Measure
	fully comprehend the benefits, leading to misinformation and resistance.
Limited Feasibility Focus	Risk mitigation planning during the pre-construction phase may be challenging, as the focus is on identifying potential impacts rather than detailed analysis and planning.
Perception of Insufficient Analysis	Holistic project evaluation during the preconstruction Phase might be perceived as insufficient by some stakeholders who may expect more in-depth studies before project approval.
Construction Phase	
Displacement and Resettlement	Construction activities, particularly for roads and drainage systems, may lead to the displacement of residents and the need for resettlement, causing disruptions to established communities. The screening exercise identified few structures which shall be affected by the project. The impact is minimal as most of the structures affected are mainly semi structures.
Noise and Air Pollution	Construction-related activities can generate high levels of noise and air pollution, impacting the well-being of residents in the construction vicinity.
Traffic Disruptions	Road construction may cause disruptions to local traffic flow, affecting businesses and creating inconvenience for residents.
Waste Generation	Construction activities can result in significant waste generation, including debris and materials, contributing to environmental pollution.
Dust and Sedimentation	Excavation and construction processes may lead to dust and sedimentation, affecting air and water quality in the area.
Visual Intrusion	The installation of high-mast lights during construction might be visually intrusive, impacting the aesthetics of the settlement.
Disturbance to Water Supply	Water supply construction may temporarily disturb existing water sources, affecting access for residents during the construction phase.
Health and Safety Risks	Construction activities pose inherent health and safety risks to both workers and residents, including accidents and exposure to hazardous materials.
GBV-Sexual Exploitation and Abuse (SEA) of communities by project workers and Sexual Harassment (SH) amongst project workers	Gender-Based Violence (GBV), specifically Sexual Exploitation and Abuse (SEA), refers to any act or threat of a sexual nature that is non-consensual and involves coercion or force. In the context of a project, this could manifest as project workers exploiting or abusing community members, particularly vulnerable individuals, through unwanted sexual advances, coercion, or other forms of sexual misconduct. On the other hand, Sexual Harassment (SH) amongst project workers involves unwelcome behaviour of a sexual nature within the project team, creating a hostile or uncomfortable work environment. Both SEA and SH can result in severe psychological, physical, and emotional consequences for victims, negatively impacting their well-being and potentially causing long-term harm.

Environmental/Socio-economic impact	Mitigation Measure
Exclusion of disadvantaged and vulnerable groups e.g., VMGs, PWDs, elderly, youth, the sick, the poor, single-women, OVC etc.	This impact involves the unintentional or deliberate exclusion of disadvantaged and vulnerable groups from project benefits and decision-making processes. These groups, including Vulnerable and Marginalized Groups (VMGs), Persons with Disabilities (PWDs), elderly individuals, youth, the sick, the poor, single women, and Orphans and Vulnerable Children (OVC), may face social, economic, or physical barriers that limit their access to project advantages. Exclusion can perpetuate existing inequalities, deepen social divisions, and deny vulnerable populations the opportunities and support they need for equitable development.
Inadequate stakeholder engagement	Inadequate stakeholder engagement refers to a lack of meaningful involvement and communication with all relevant stakeholders throughout the project lifecycle. This can lead to a lack of understanding of local concerns, needs, and aspirations, potentially resulting in project designs and implementations that do not align with the community's expectations. Inadequate stakeholder engagement may foster mistrust, increase resistance to the project, and hinder the identification and mitigation of potential negative impacts.
Ineffective GRM (Grievance Redress Mechanism)	An ineffective Grievance Redress Mechanism (GRM) implies that the project lacks a structured and responsive system for addressing complaints and grievances raised by stakeholders. This can result in unresolved issues, escalating tensions, and a breakdown in community relations. An effective GRM is crucial for maintaining transparency, accountability, and social cohesion by providing a platform for stakeholders to voice their concerns and seek resolution for project-related grievances.
Operation Phase	
Increased Traffic	Improved roads may lead to increased traffic in the settlement, potentially causing congestion and safety concerns.
Light Pollution	The operation of high-mast lights may contribute to light pollution, affecting the natural night environment and potentially disturbing residents.
Potential Water Contamination	Operation of water supply infrastructure may pose risks of water contamination if not properly maintained.
Maintenance Disruptions	Routine maintenance of roads and drainage systems may cause disruptions, affecting the daily lives of residents.
Energy Consumption	The operation of street lighting requires ongoing energy consumption, contributing to environmental impacts if not sourced sustainably.
Social and Economic Changes	The operation phase may bring about social and economic changes, potentially leading to gentrification or shifts in the settlement dynamics.
Ongoing Noise from Infrastructure	Continuous operation of drainage systems may generate noise, impacting the quality of life for nearby residents.

Environmental/Socio-economic impact	Mitigation Measure
Potential Disputes	Ongoing operational changes may lead to disputes among residents, particularly if the benefits are not evenly distributed or if there are unforeseen negative consequences.
Decommissioning Phase	
Waste Disposal	Decommissioning activities may generate additional waste, necessitating proper disposal methods to avoid environmental pollution.
Disruption to Services	Decommissioning may temporarily disrupt services such as water supply, causing inconvenience to residents.
Potential Resettlement	In some cases, decommissioning activities may lead to further resettlement, impacting residents who had adjusted to the infrastructure.
Economic Shifts	Decommissioning may bring about economic shifts, affecting businesses and livelihoods that had adapted to the presence of the infrastructure.
Environmental Disturbance	Decommissioning activities may disturb the environment, requiring careful planning to minimize ecological impacts.
Community Resistance	Residents may resist decommissioning if they perceive negative impacts on their daily lives or if they had grown accustomed to the infrastructure.
Safety Concerns	Decommissioning poses safety concerns, particularly if not executed with precision, potentially causing accidents or injuries.
Uncertain Transition	Residents may face uncertainty during the decommissioning phase, not knowing what changes to expect and how it will affect their settlement.

E10: Monitoring on Mitigation of Impacts

The study observed that mitigation measures, design features, or actual impacts should be monitored to ensure acceptability of the project both during and after construction works. In some cases, monitoring can be done as part of routine or periodic maintenance, while socio-economic or ecological parameters can only be effectively assessed in the longer term. Parameters that can be monitored include:

(i) Soil conservation interventions,
(ii) Efficiency of drainage structures,
(iii) Impact on public health (due to STIs, clean drinking water),
(iv) Air quality,
(v) Noise quality, and
(vi) Sanitation at the workmen's camp.

Integrated monitoring requires the participation by majority of stakeholders so as to ensure that critical success factors are properly worked on throughout the monitoring period.

E11: Cost Implications of Mitigation and Monitoring Measures

The broad cost estimate for mitigation and monitoring measures including control measures for resettlement of affected persons and properties, soil erosion and tree planting, drainage

impediment, fuel, labour camps, traffic controls and deviations, public health and occupational safety and HIV/AIDS is estimated at KES 3,010,250.00.

E12: Conclusions and Recommendations

E12.1 Conclusions

The Huruma Settlement infrastructure upgrade project is a commendable initiative aimed at enhancing the well-being and livelihoods of the local community through the development of roads, drainage systems, water supply extension, and street lighting infrastructure. While the project holds positive intentions, it is crucial to acknowledge and address potential negative impacts such as resettlement and demolition, noise and air pollution, disruptions to daily activities, and the risk of flooding and social vices. The existing open sewer further adds to the challenges, necessitating a thorough assessment through an ESIA.

E12.2 Recommendations

Environmental and Social Impact Assessment (ESIA): There is a need for an ESIA in accordance with the principles of OP 4.01 Environmental Assessment of the World Bank and the regulations outlined in Legal Notice 31 and 32 of the Environmental Impact Assessment and Audit Regulations amended in 2019. This assessment should thoroughly evaluate the nature, magnitude, and extent of potential impacts and serve as the basis for subsequent decision-making.

Environmental and Social Management Plan (ESMP): Develop a robust ESMP as an integral part of the ESIA process. The ESMP should outline clear mitigation measures and monitoring strategies to address identified impacts and ensure responsible and sustainable project implementation. This plan should align with both World Bank safeguards and Kenyan regulatory requirements.

Stakeholder Engagement: Enhance stakeholder engagement throughout the ESIA process. Involve local communities, governmental bodies, and other relevant stakeholders in the decision-making process. Establish effective communication channels and a grievance redress Mechanism to address concerns and feedback.

Resettlement Planning: Resettlement Planning: If resettlement is deemed necessary, develop a Resettlement Action Plan (RAP) that ensures fair compensation, proper relocation arrangements, and opportunities for improved housing and living conditions. Prioritize the well-being of affected residents. During the Screening process 6 potential PAPs were identified in Huruma. A proper ARAP will be done that will include any affected properties and persons. However, no displacement is anticipated at this stage.

Pollution Control Measures: Implement pollution control measures, including the use of low-emission construction equipment and dust control strategies. Prioritize the reduction of environmental pollution to create a healthier living environment for the settlement.

Employment Opportunities: Maximize the positive impact of the project by creating employment opportunities during the construction phase. Foster local development and economic activities to contribute to the overall improvement of the community.

Monitoring and Reporting: Establish a robust monitoring and reporting framework to track the implementation of the ESMP and ensure compliance with environmental and social standards.

Regularly communicate progress and findings to relevant stakeholders, fostering transparency and accountability.

By adhering to these recommendations, the project can strike a balance between achieving its positive outcomes and mitigating potential negative impacts, ultimately contributing to the sustainable development and improvement of the Huruma Settlement and its residents' quality of life.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Most urban areas in Kenya are characterized by informal settlements arising from high population and poverty levels in addition to various other factors that vary from one urban centre to another. Coupled with high levels of unemployment and low income per household, there is little saving to invest in suitable housing. It is estimated that about 90% of informal settlements residents pay rent for their houses that are of poor quality and owned by very few landlords (only about 10% of the residents owns the houses). There is also low incentive for the landowners in the informal settlements to invest in good houses. Likewise, it has not been possible to provide appropriate sanitation, water supply, drainage and solid waste disposal, further worsening the environmental conditions. These conditions, coupled with the level of housing are considered poor and are part of the intervention targeted by this World Bank Project under the Kenya Informal Settlements Improvement Project Phase II (KISIP II).

1.1.1 Characteristics of Informal Settlement

The following are the characteristics of an informal settlement (slum):

- Lack of basic services
- Unplanned and underserved neighbourhood typically settled by squatters without legal recognition or rights
- Overcrowding and high density
- Poor housing conditions as reflected in hazardous location, impermanent structure and insufficient living area (three or more people per room);
- Inadequate access to: improved water at affordable prices and without extreme effort; improved sanitation to a private or public toilet shared with a reasonable number of people; and other infrastructure services.
- For lack of security, inhabitants seldom organize themselves into vigilante groups to ward off would be criminals

1.2 Overview of Social Economic Dimensions of Informal Settlements

It is estimated that 60% of Kenya's population live in the informal settlements with the number of people expected to rise even more. Informal settlements can be categorized into two: squatter settlements and those that arise out of illegal sub-divisions of either government or private land. In the country, most of these settlements are characterized by lack of access to water and sanitation, insecure tenure, lack of adequate housing, poor environmental conditions, and high crime rates (UN Habitat, 2008).

Rapid growth of informal slum settlements in the country can be attributed to a number of factors among them increasing income inequalities and urban poverty, increasing rates of rural urban migration, inefficient land delivery systems, high costs of urban living and poor investment in low income housing, among other factors. Like in many other parts of the world, slum settlements in the country are situated in areas that are unsuitable for construction, such as riparian reserves, steep hill sides, abandoned quarry sites and marshy areas. Others are located next to areas that can offer employment opportunities to the residents. Close to 90 per cent of the slum households rent from private-sector landlords (who, in the past, often had the political connections that helped them to protect their investments).

This notwithstanding, most of the inhabitants earn low incomes and have limited assets. Employment is largely low skill (domestic help, waiter, bar maid, guard), often on a casual basis (construction labour), small business owners (kiosk owner, newspaper seller) and other low income-generating activities. In recent times, discrimination especially along ethnic lines has been highly experienced in some areas, with most ethnic groups living in (sub) communities of their own ethnic background. Even though clashes between ethnic groups have in the past been experienced it can be stated that slums themselves are not a major source of urban unrest, although they constitute areas with a higher concentration of crime, violence and victimization.

1.3 Project Area

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground.

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Limited Feasibility Focus	Risk mitigation planning during the pre-construction phase may be challenging, as the focus is on identifying potential impacts rather than detailed analysis and planning.

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Exclusion of disadvantaged and vulnerable groups e.g., VMGs, PWDs, elderly, youth, the sick, the	This impact involves the unintentional or deliberate exclusion of disadvantaged and vulnerable groups from project benefits and decision-making processes. These groups, including Vulnerable and Marginalized Groups (VMGs), Persons with Disabilities (PWDs), elderly individuals, youth, the sick, the poor, single

Environmental/Socio-economic impact	Mitigation Measure
poor, single-women, OVC etc.	women, and Orphans and Vulnerable Children (OVC), may face social, economic, or physical barriers that limit their access to project advantages. Exclusion can perpetuate existing inequalities, deepen social divisions, and deny vulnerable populations the opportunities and support they need for equitable development.
Inadequate stakeholder engagement	Inadequate stakeholder engagement refers to a lack of meaningful involvement and communication with all relevant stakeholders throughout the project lifecycle. This can lead to a lack of understanding of local concerns, needs, and aspirations, potentially resulting in project designs and implementations that do not align with the community's expectations. Inadequate stakeholder engagement may foster mistrust, increase resistance to the project, and hinder the identification and mitigation of potential negative impacts.
Ineffective GRM (Grievance Redress Mechanism)	An ineffective Grievance Redress Mechanism (GRM) implies that the project lacks a structured and responsive system for addressing complaints and grievances raised by stakeholders. This can result in unresolved issues, escalating tensions, and a breakdown in community relations. An effective GRM is crucial for maintaining transparency, accountability, and social cohesion by providing a platform for stakeholders to voice their concerns and seek resolution for project-related grievances.
Operation Phase	
Increased Traffic	Improved roads may lead to increased traffic in the settlement, potentially causing congestion and safety concerns.
Light Pollution	The operation of high-mast lights may contribute to light pollution, affecting the natural night environment and potentially disturbing residents.
Potential Water Contamination	Operation of water supply infrastructure may pose risks of water contamination if not properly maintained.
Maintenance Disruptions	Routine maintenance of roads and drainage systems may cause disruptions, affecting the daily lives of residents.
Energy Consumption	The operation of street lighting requires ongoing energy consumption, contributing to environmental impacts if not sourced sustainably.
Social and Economic Changes	The operation phase may bring about social and economic changes, potentially leading to gentrification or shifts in the settlement dynamics.
Ongoing Noise from Infrastructure	Continuous operation of drainage systems may generate noise, impacting the quality of life for nearby residents.
Potential Disputes	Ongoing operational changes may lead to disputes among residents, particularly if the benefits are not evenly distributed or if there are unforeseen negative consequences.
Decommissioning Phase	

Environmental/Socio-economic impact	Mitigation Measure
Waste Disposal	Decommissioning activities may generate additional waste, necessitating proper disposal methods to avoid environmental pollution.
Disruption to Services	Decommissioning may temporarily disrupt services such as water supply, causing inconvenience to residents.
Potential Resettlement	In some cases, decommissioning activities may lead to further resettlement, impacting residents who had adjusted to the infrastructure.
Economic Shifts	Decommissioning may bring about economic shifts, affecting businesses and livelihoods that had adapted to the presence of the infrastructure.
Environmental Disturbance	Decommissioning activities may disturb the environment, requiring careful planning to minimize ecological impacts.
Community Resistance	Residents may resist decommissioning if they perceive negative impacts on their daily lives or if they had grown accustomed to the infrastructure.
Safety Concerns	Decommissioning poses safety concerns, particularly if not executed with precision, potentially causing accidents or injuries.
Uncertain Transition	Residents may face uncertainty during the decommissioning phase, not knowing what changes to expect and how it will affect their settlement.

E10: Monitoring on Mitigation of Impacts

The study observed that mitigation measures, design features, or actual impacts should be monitored to ensure acceptability of the project both during and after construction works. In some cases, monitoring can be done as part of routine or periodic maintenance, while socio-economic or ecological parameters can only be effectively assessed in the longer term. Parameters that can be monitored include:

(vii) Soil conservation interventions,
(viii) Efficiency of drainage structures,
(ix) Impact on public health (due to STIs, clean drinking water),
(x) Air quality,
(xi) Noise quality, and
(xii) Sanitation at the workmen's camp.

Integrated monitoring requires the participation by majority of stakeholders so as to ensure that critical success factors are properly worked on throughout the monitoring period.

E11: Cost Implications of Mitigation and Monitoring Measures

The broad cost estimate for mitigation and monitoring measures including control measures for resettlement of affected persons and properties, soil erosion and tree planting, drainage impediment, fuel, labour camps, traffic controls and deviations, public health and occupational safety and HIV/AIDS is estimated at KES 3,010,250.00.

E12: Conclusions and Recommendations

E12.1 Conclusions

The Huruma Settlement infrastructure upgrade project is a commendable initiative aimed at enhancing the well-being and livelihoods of the local community through the development of roads, drainage systems, water supply extension, and street lighting infrastructure. While the project holds positive intentions, it is crucial to acknowledge and address potential negative impacts such as resettlement and demolition, noise and air pollution, disruptions to daily activities, and the risk of flooding and social vices. The existing open sewer further adds to the challenges, necessitating a thorough assessment through an ESIA.

E12.2 Recommendations

Environmental and Social Impact Assessment (ESIA): There is a need for an ESIA in accordance with the principles of OP 4.01 Environmental Assessment of the World Bank and the regulations outlined in Legal Notice 31 and 32 of the Environmental Impact Assessment and Audit Regulations amended in 2019. This assessment should thoroughly evaluate the nature, magnitude, and extent of potential impacts and serve as the basis for subsequent decision-making.

Environmental and Social Management Plan (ESMP): Develop a robust ESMP as an integral part of the ESIA process. The ESMP should outline clear mitigation measures and monitoring strategies to address identified impacts and ensure responsible and sustainable project implementation. This plan should align with both World Bank safeguards and Kenyan regulatory requirements.

Stakeholder Engagement: Enhance stakeholder engagement throughout the ESIA process. Involve local communities, governmental bodies, and other relevant stakeholders in the decision-making process. Establish effective communication channels and a grievance redress Mechanism to address concerns and feedback.

Resettlement Planning: Resettlement Planning: If resettlement is deemed necessary, develop a Resettlement Action Plan (RAP) that ensures fair compensation, proper relocation arrangements, and opportunities for improved housing and living conditions. Prioritize the well-being of affected residents. During the Screening process 6 potential PAPs were identified in Huruma. A proper ARAP will be done that will include any affected properties and persons. However, no displacement is anticipated at this stage.

Pollution Control Measures: Implement pollution control measures, including the use of low-emission construction equipment and dust control strategies. Prioritize the reduction of environmental pollution to create a healthier living environment for the settlement.

Employment Opportunities: Maximize the positive impact of the project by creating employment opportunities during the construction phase. Foster local development and economic activities to contribute to the overall improvement of the community.

Monitoring and Reporting: Establish a robust monitoring and reporting framework to track the implementation of the ESMP and ensure compliance with environmental and social standards.

Regularly communicate progress and findings to relevant stakeholders, fostering transparency and accountability.

By adhering to these recommendations, the project can strike a balance between achieving its positive outcomes and mitigating potential negative impacts, ultimately contributing to the sustainable development and improvement of the Huruma Settlement and its residents' quality of life.

1.9 ESIA Study Team

The study team consisted of the following:

1. Jenesio Kinyamario, Environmentalist and Lead Expert (NEMA Reg. No. 0134);
2. Eng. Patrick Githinji, Design Engineer
3. Elijah Kimani Mutuango – Socio-economist,
4. - Land Use Planner;
5. - Hydrologist;
6. - Civil Engineers; and
7. - Surveyors.

1.10 Budget

The budget is estimated to total about **KES 116,606,031 excluding 16% VAT and 10% Contingencies.** This is inclusive of the budget for implementation of ESMP at KES 2,762,600.

CHAPETER 2 : PROJECT DESCRIPTION AND DESIGN

2.1 Project location

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground.

Misri is 2280m asl as shown on Figure 2 which is generally sloping towards the valley to the South. Soils are volcanic red soils are poorly drained during the rainy season making the not easily motorable. This will affect the road infrastructure especially before construction of the proposed structures. After construction phase, this will ultimately mitigate for this probability in future.

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground. Misri is located in the Mabrouke Sub-Location, Limuru East Location, Limuru East Ward and Limuru Sub-County, Kiambu County.

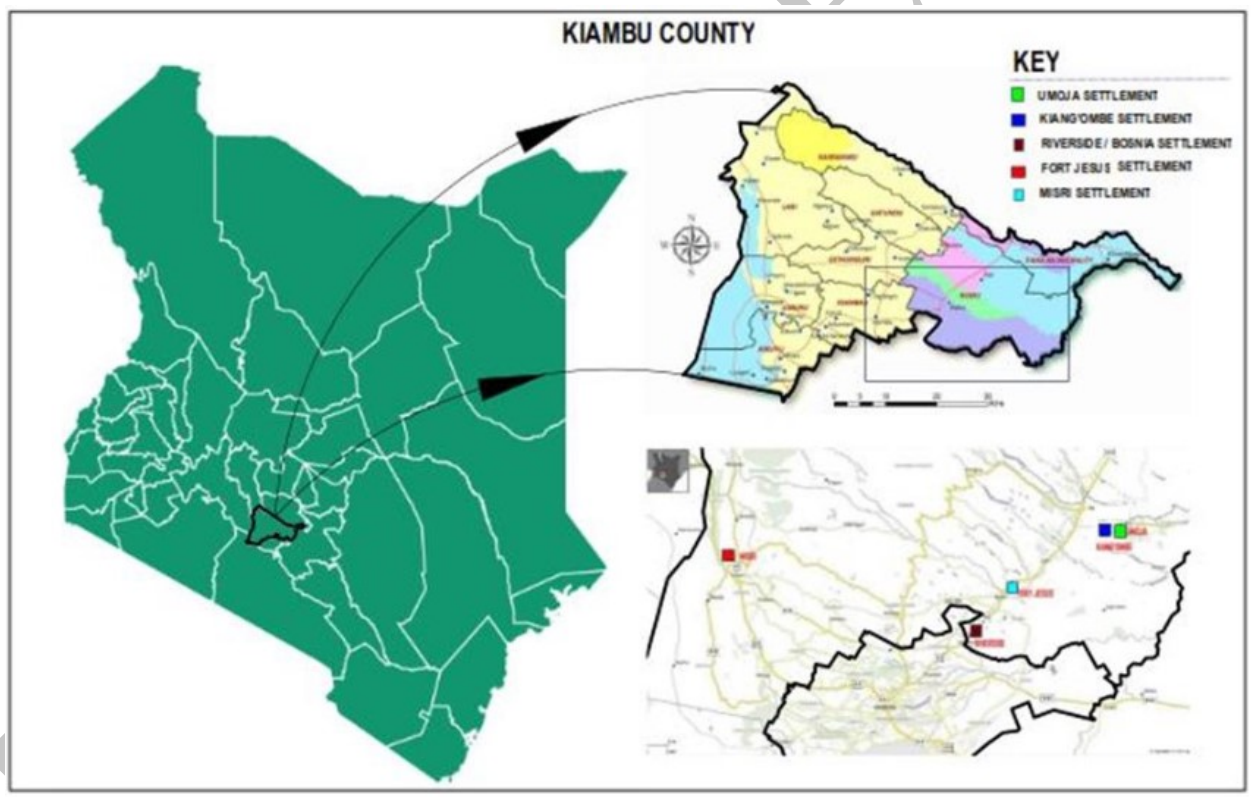


Figure 1 - Location Map of Misri Settlement

2.2 Project Context

2.2.1 Purpose

The purpose of the project is to enhance the infrastructure within informal settlements to provide residents with better access to essential services such as clean water, sanitation, electricity, roads, and drainage systems. The ultimate goal is to improve living standards, health, and safety for residents.

The implementation of the project shall address the infrastructure deficits in Misri settlement to promote inclusive urban development and improve the quality of life for marginalized communities.

2.2.2 Project Scope

The project scope includes assessing the existing infrastructure deficiencies in the informal settlement, identifying priority areas for improvement, designing appropriate solutions, and implementing upgrades. This shall involve constructing new infrastructure, upgrading existing facilities, and incorporating sustainable and resilient design principles. As per the prioritization carried out by the community, the following is the scope of works as designed for the first packaging of the works.

The proposed project comprises of construction of 1161m of roads within the settlement with the following characteristics.

Table 3 - Designed Roads Characteristics

Characteristic	Description
Cross Section Type	A
Lanes	2, 2 Directional
Surfacing	60mm medium duty paving blocks
Carriageway Width	5m, 3.0 m
Footpath	1.5m
Camber	2.5%

The roads will include storm drainage system running along the roads. The project will also include construction of 65 Nr solar streetlights and 30Nr Grid connected flood lights to improve security in the area.

Table 4 - Misri Settlement Project Details

Misri Settlement		
Roads /footpath	Construction of 1161m of roads	
	MSR RD01	456m

	MSR RD02	563m
	MSR RD04	30m
	MSR RD04	32m
	MSR RD06	44m
	MSR RD07	36m
Storm water Drainage	Construction of 1161m of Storm water Drainage	
Public lighting	Construction of 65Nr Street light and 35Nr. flood lights	

Figure 2 – Misri Settlement Layout Map

2.2.3 Goals

The primary goals of the project shall include:

- Providing access to clean water sources and improving sanitation facilities to reduce the risk of waterborne diseases.
- Upgrading and installation of security lighting infrastructure to ensure safety for residents.

- Improving road networks and transportation infrastructure to enhance connectivity within the settlement and with the surrounding areas.
- Implementing drainage systems to mitigate flooding and waterlogging during heavy rains.
- Enhancing community resilience to natural disasters and climate change impacts through infrastructure upgrades.
- Promoting community participation and empowerment in the decision-making process.

2.2.4 Target Audience

The primary target audience includes residents Misri Settlement who will directly benefit from the infrastructure upgrades. Additionally, local government authorities (County), non-governmental organizations (NGOs), community-based organizations (CBOs), and other stakeholders are also key audiences involved in planning and implementing the project.

2.2.5 Challenges

Some challenges associated with the informal settlement infrastructure upgrading project, lack of formal planning and regulation, resistance from residents, environmental constraints, and the need for community engagement and capacity building.

2.2.6 Approach

The project shall adopt a participatory approach, involving collaboration between government agencies, NGOs, community representatives, and other stakeholders. It will prioritize the needs and preferences of the residents while ensuring the sustainability and affordability of the proposed infrastructure solutions.

2.3 Existing Status of Infrastructure in Misri Settlement

2.3.1 Water and Sanitation

The primary sources of water in the project area vary, with 51% relying on plot-based water connections and 49% having individual water connections, as illustrated in Figure 4.17 below. This distribution highlights the different water supply infrastructure configurations within the surveyed community.

Sanitary conditions play a crucial role in any human settlement, directly influencing the environment and the health of inhabitants. According to the study, 11% of respondents have access to public latrines, 19% use plot-based latrines, 50% have plot-based sewer toilets, 3% utilize individual septic-connected toilets, 3% use individual sewer-connected toilets, and 14% lack access to any sanitary facilities. These findings highlight the diverse range of sanitation facilities and the varying levels of access within the surveyed community.

2.3.2 Electricity and Security/Street Lighting

The project area is seamlessly connected to the Kenya Power and Lighting Company (KPLC), with 90% of households relying on electricity as their primary source of power. In regard to the cooking energy, majority (48%) uses LGP while another 40% using charcoal.

2.3.3 Roads and Footpaths

The key access road to the project site is the Limuru - Kiambu road which connects to the A1 trunk road Nairobi – Nakuru Highway. All roads within the settlement are gravel surfaced and motorable.

2.3.4 Drainage and Flooding

All existing roads have very poor drainage systems which contributes to flooding during the rainy season.

2.4 Project Prioritization during Focus Groups Discussions

2.4.1 Description of Misri Settlement

a) Location

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground.

Misri is 2280m asl as shown on Figure 2 which is generally sloping towards the valley to the South. Soils are volcanic red soils are poorly drained during the rainy season making the not easily motorable. This will affect the road infrastructure especially before construction of the proposed structures. After construction phase, this will ultimately mitigate for this probability in future.

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground. Misri is located in the Mabrouke Sub-Location, Limuru East Location, Limuru East Ward and Limuru Sub-County, Kiambu County.

b) Population

The project area is Misri settlement which is within Mabroukie Sub-Locations, Limuru East Location, Limuru East Ward, Limuru Sub-County, Kiambu County. According to the 2019 Kenya Population and Housing Census, Kiambu County population is 2,417,735 with 1,187,146 males and 1,230,454 females. Further, it had a population density of 952 persons per square kilometer in 2019. The population density was projected at 1025, 1085 and 1125 persons per square kilometer in the year 2022, 2025 and 2027 respectively. This is influenced by the county' high population growth rate, which is at 2.4% annually. The population of the sub-county of Ruiru within which the proposed project area lies, has a total of 371,111 which is expected to rise to 438,222 by 2027 covering an area of 201.1 km^2. The settlement has 10,000 Households.

2.4.2 Prioritized Interventions

A community participatory meeting was held on 13th November 2023 at Goshen land FPFP Church located within the Settlement to prioritize the projects preferred by the community. The following projects were prioritized as follows:

1. Roads
2. Mast Flag Lights
3. Drainage System
4. Sewer System
5. Gabions

Some of the prioritized Roads have been designed under the main packaged works which includes the corresponding drainage and 65 Nr Solar Street lighting. The other prioritized roads have been designed and being packaged under package 2 of the works. 30 Nr Grid connected security flood lights are being implemented in the settlement directly by the County Government of Kiambu.

The following is the comparison of the prioritized projects versus the designed under the first package.

Table 5 - Priotized Vs Designed Roads Projects

PRIORITIZED		**DESIGNED**	
No.	***LENGTH(M)***	***No.***	***LENGTH(M)***
MSR RD01	456	MSR RD01	456
MSR RD02	563	MSR RD02	563
MSR RD04	30	MSR RD04	30
MSR RD04	32	MSR RD04	32
MSR RD06	44	MSR RD06	44
MSR RD07	36	MSR RD07	36
MSR RD07	273		
MSR RD08	192		
MSR RD09	220		
MSR RD10	230		
MSR RD11	111		
MSR RD12	35		
MSR RD13	77		
MSR RD14	64		
MSR RD15	63		

MSR RD16	66		
MSR RD17	254		
MSR RD18	57		
MSR RD19	67		
MSR RD20	53		
MSR RD21	120		
	3043		**1161**

The remaining prioritized roads and other priorities shall be designed and packaged as Package 2.

2.5 Project Design Interventions

The project design concepts were derived from the existing infrastructure condition and the community priorities and views. The relevant Kiambu County Government representatives were also engaged in the concept and design process. All infrastructure projects are guided by existing national standards/laws and county technical by-laws; the designs are based on sound value engineering principles and feasible on the ground.

Certain infrastructure elements are interdependent and function in tandem. For instance, the construction of a road necessitates the incorporation of proper drainage, as a road lacking adequate drainage is prone to a shortened lifespan.

Public lighting, encompassing floodlights and streetlights, is closely tied to the level of electrification in an area. Additionally, it directly impacts the security and safety of residents. The presence and functionality of public lighting play a crucial role in enhancing visibility and deterring potential security risks, making it an integral component of community well-being.

All the project designs and proposed features are shown in the detailed drawings, which are submitted as the Book of Drawings contained in the project design report. The book of drawings generally contains the list of Drawings, Project Location Map, Legends and Abbreviations, Plans and Profiles of Carriageway, Main Drains and Footpaths, Detailed Cross Sections, Junction Layouts, Typical Cross Sections of Road Formations, Standard drawings, Miscellaneous drawings of kerb stones, drainage cross-sections, chute drains in fill sections, pedestrian railing, details of street lamp posts including monopoles security lighting, Standard drawings of road markings and signs, sign boards, minor/major junctions, kerbs, Layouts Drawings (Roads, Drainage, Water Supply, Sanitation, Security Lighting and Solid Waste Management Plan) and Sanitation facilities.

2.5.1 Roads and footpath designs

The geometric design of the project roads has been done to follows the existing alignment as close as possible. Aspects considered in the geometric design include but limited to: -

- Horizontal alignment,
- Vertical alignment,
- Road cross section
- Super elevation of curves,

- Road widening,
- Junctions and
- Bus bays

The geometric design sought to identify the most economic, safe and practical horizontal and vertical alignments such that; the desired roads can physically be realized and the total performance of the constructed road is adequate. The design is to offer a combination of uninterrupted traffic flow sections and junctions. The un-interrupted traffic flow section is the road link, the right of way reserved for unhindered vehicular travel between two locations along a route while an intersection space is the entire area shared by the joining or crossing of a number of basic road spaces.

The overarching goal of the geometric design is to identify the most economical, safe, and practical horizontal and vertical alignments. This ensures that the desired roads can be physically realized, and the overall performance of the constructed road is deemed adequate. The design aims to create a balance between providing uninterrupted traffic flow sections and efficient junctions.

Additionally, the road cross sections, as depicted in the figure below, contribute to low carbon emissions by potentially optimizing traffic flow, reducing congestion, and enhancing overall road efficiency. This can result in smoother traffic patterns, minimizing idling time for vehicles and subsequently reducing carbon emissions associated with transportation. The road design cross-sections are shown in the figure 4 below.

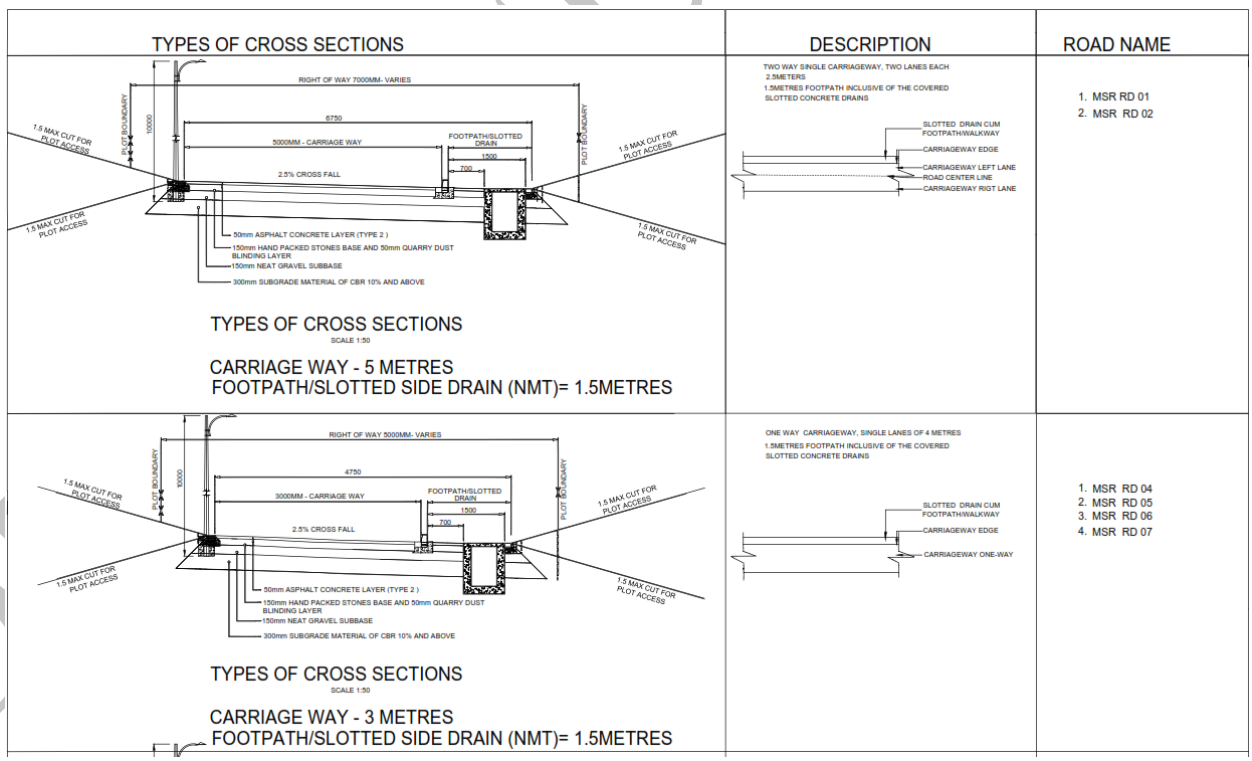


Figure 3 - Typical Road Cross Sections – Misri Settlement

2.5.2 Drainage Design

For all the alignments in the project areas, a covered u-drain of 0.5m wide have been proposed with removable cover slab at every 5m being a provision for inspection and cleaning. The drain will be channelled to existing outfalls mainly rivers.

Catch Water will be provided on cut slopes to intercept water flowing from upper reach and to guide such flow into culverts.

Maintenance of the drainage system involves removing vegetation growth from the unlined side drains and thoroughly cleaning them to minimize friction. These drains are then directed towards nearby culverts or natural depressions.

To ensure proper water flow down the slope, a dedicated maintenance team is necessary. This team is responsible for desilting the side drains and guiding the water along a defined path. Occasionally, side drains may experience upheaval, causing their bed levels to rise. In such instances, water may deviate from the drains, flowing laterally through the pavement and causing damage. This disruption in drainage gradients can impede surface flow. Apart from clearing side drains, the maintenance team should address upheavals and depressions on the drain beds, ensuring that the drains are consistently positioned at levels lower than the pavement with suitable gradients for effective water disposal.
Regular maintenance is also crucial for lined drains and catch pits, involving routine checks for blockages or damage. Immediate remedial measures should be implemented to uphold an efficient drainage system.

Table 6 - Schedule of Proposed Cross Culverts

Cross Culverts				
SN	**Road Name/ID**	**Chainage (Kms)**	**Diameter(mm)**	**Hydraulic Capacity(m^3/s)**
Misri Settlement				
1	MSR RD01	0+140	900	1.09
2	MSR RD01	0+340	900	1.09
3	MSR RD02	0+340	900	1.09

Table 7 - Schedule of Covered U-Drain

	Misri Settlement					
	Schedule of Covered U-Drain with Inspection Chambers					
SN	**Road Name**	**Side**	**From (Km)**	**To(Km)**	**Internal W(m)**	**H(m)**
1	MSR RD01	LHS	0+000	0+455	0.5	0.8
2	MSR RD02	LHS	0+000	0+563	0.5	0.8

2.5.3 Public Lighting

All the designed roads shall have street lighting at a spacing of about 20m. Misri Settlement will have about 107 street lighting with the following design characteristics.

- An integrated solar street light fitting with 30Ah, 12.8V Lithium Ferro Phosphate battery with 2000 charge and discharge cycles; in-built 60Wp, 17Vmp, 21Voc monocrystalline solar panel; 35W MPPT charge controller; light on/off control and motion detection sensors; pressure die cast aluminium for sturdiness and long life, and specially designed pole mounting bracket to allow different tilt angles, lateral and pole top mounting. The luminaire to be of LED type with 6000 lumen, 175lm/W, 5700K, L70B50 50000h lifespan, and rated IP65 and IK08; complete with mounting accessories for 6m high galvanised steel lighting pole, as Philips SunStay BRP710 LED60 CW MR HY FDIM20 SOLAR, or approved equivalent.
- Installation of 10m high round section tapering concrete column with single –arm street lighting manufactured from Class-C galvanized steel pipe with 1.2m bracket with 0 degrees tilt with anti-vandal, anti-theft, and anti-climbing features and all accessories to meet 10m mounting height requirements as shown in the drawings and in the Technical Specifications.

  The figure 5 below shows the construction details of the street lighting.

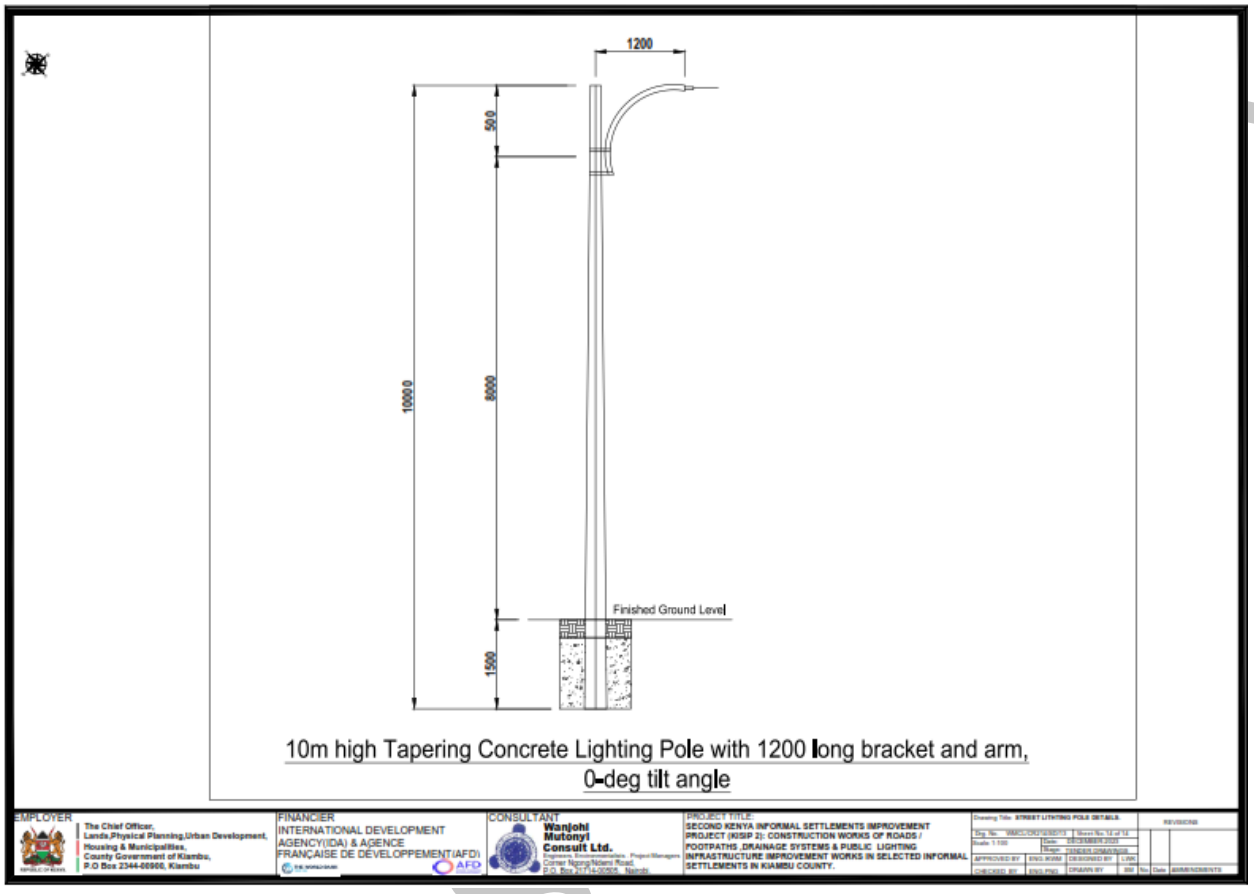


Figure 4 - Typical Street Lighting Detail

2.6 Project Cost

The estimated project cost for Kiambu County KISIP 2 projects is Kshs. **604,172,253 (Kenya Shillings Six Hundred and Four Million, One Hundred Seventy Two Thousand, Two Hundred Fifty Three Only)**. The proponent is thus required by law (regulation 48 of the Environmental (Impact Assessment and Audit) Regulations, 2003) to pay 0.1% of the project cost as NEMA license processing fee GAZETTE NOTICE NO. 13211. In this aspect, Ksh **604,172.25 (Kenyan shillings Six Hundred and Four Thousand, One Hundred and Seventy Two, Twenty Five Cents Only)** shall be paid to NEMA by the proponent for NEMA Licensing process.

This covers the total NEMA fees for both the five Settlements namely, Umoja, Kiang'ombe, Gitambaya/Fort Jesus, Bosnia/Riverside and Misri.

CHAPTER 3 : ANALYSIS OF PROJECT ALTERNATIVES

3.1 Introduction

This chapter describes and examines the various alternatives available for the project. The consideration of alternatives is one of the more proactive sides of environmental assessment - enhancing the project design through examining options instead of only focusing on the more defensive task of reducing adverse impacts of a single design. This calls for the comparison of feasible alternatives for the proposed project site, technology, and/or operational alternatives. Alternatives have to compare in terms of their potential environmental impacts, capital and recurrent costs, suitability under local conditions, and acceptability by neighbouring land users.

3.2 Selection of Settlement for Infrastructure Improvement

Environment and social impacts are minimized as a direct consequence of the settlement selection in that the proposed projects location must not have adverse impacts to the identified location. The following considerations were made:

Land Requirements: The proposed project areas within the settlement are located on land that is owned by Kiambu County Government. The projects have been designed to only utilize the road reserves as designated on the Physical Development Plans (PDPs) developed by KISIP 2 component for the targeted settlements. No private land will be acquired for the project. This has significantly minimized displacement of populations and livelihoods as a result of the Project and the need to carry out resettlement. A separate Abbreviated RAP was prepared for the Project components which have an impact to people's assets and sources of livelihood along the proposed project corridors.

Location: The proposed project sites are located within the Limuru Town urban area with no sensitive environmental features.

Settlement size and density: Misri settlement has a population of 10,000 households with an average of 5 persons per household which is about 50,000 persons with projections indicating a high of 52,430 people by the year 2025. (CIDP report) and hence a priority in benefitting from the investments.

Scale of potential displacement of residents: The proposed developments are situated in areas with no displacements of residential houses and with minimal displacements of businesses in terms of makeshift sheds especially along the wayleaves.

Proximity to trunk infrastructure: The prioritized projects to be implemented are within close close proximity to core trunk infrastructure (such as roads and trunk lines for water and electricity). The roads to be implemented are connected to other roads which have a direct access to the main Nairobi – Nakuru highway.

Need to eliminate economic differentials: KISIP 2 is by design biased towards support to informal settlements. The motivating criteria is to improve quality of life in informal settlements towards building equality and attaining both local and globally accepted standards for quality of life. Misri Settlement is fast growing and in turn requires faster connectivity and infrastructure.

Compliance with Kenyan law: Misri Settlement is located within an urbanized area of Limuru town, away from riparian areas. The proposed developments including Roads and footpaths, Storm water Drainage and Public lighting will be located within the government planning area and will not involve any relocation.

3.2 Construction of Proposed infrastructure projects

The project components comprise roads & drainage and security lighting. Project alternatives was majorly analyzed for roads, drainages and street lighting proposed for unserved and underserved areas.

3.3 No project alternative

In this alternative, the existing conditions in the settlement would remain. It will mean that all the economic and social benefits to settlement and the surrounding areas from the project will be foregone.

The **"No-Project" option** will imply the status quo remain, with the existing facilities and infrastructure without an expansion plan.

This is not a preferred option by either the beneficiaries or the country in general. If the Proponent takes no action, and does not upgrade the infrastructure, impacts would be the "business as usual" causing socio-economic stagnation and proliferation of water borne disease in the project area.

3.4 Design Alternatives

The engineering design has basically followed the recommendations of the design manuals referenced in the design review report. However, due to the uniqueness of the site, some design Alternatives were incorporated in the project as briefly explained in the sections below:

i. The street lights were designed as a hybrid system to accommodate both solar energy and national grid.
ii. Due to varied widths of the road alignments for the settlements, specific cross sections were proposed for each alignment fitting the necessary services within the available space
iii. The topography of the settlements brings out unique surface runoff drainage challenges. There are a number of localized drainage problems where natural drainage system to the existing water ways lacks. In such cases, vertical drains were proposed to address such challenges

3.5 Design Standards

3.5.1 Design approach

The approaches to the detailed engineering solutions that has been taken into account are:

i. Optimized the use of materials for construction;
ii. Improved geometric deficiencies;

iii. Improved the junctions;
iv. Provided access culverts and improved access roads for public convenience to major buildings;
v. Provided cross-drainage structures with adequate opening size and proper protection work;
vi. Providing roadside drainage with adequate capacity;
vii. Proper outfall connectivity of the longitudinal drains/ ditches, has been proposed;
viii. Proper outfall of culverts has been designed;

The main outcomes of the design approach adopted are explained below.

3.5.2 Drainage Systems:

i. **Permeable Pavement:** Use of Permeable surfaces such as permeable concrete or interlocking permeable pavers allow water to infiltrate and contributes to reduction of runoff and erosion.
ii. **Bio retention Cells/ rain gardens**: These are landscaped areas which collect and treat storm water naturally hence promoting filtration and reducing the burden on traditional drainage systems.

3.5.3 Roads Alternatives

When designing the roads in Misri informal settlement, focus has been made to providing accessible, durable, and cost-effective infrastructure that improves the quality of life for residents. Additionally, the chosen design and technology has been considered adaptable to the unique characteristics of the informal settlement, such as narrow pathways and varying topography.

The available alternative technologies considered include the use of paving blocks for use by vehicular traffic and bitumen tarmacked roads. The roads will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. The technology to be adopted in this case, bitumen surfaced road, has been majorly informed by the community preference for road surfacing material and the availability of the preferred material. The most economically viable and sensitive to the environment materials have also been considered.

3.5.4 Lighting and electric Alternatives

i. Solar powered alternative

The option of solar power uses batteries to store power during the day for use at night. This option has high initial cost but it is sustainable in the long run as it utilizes renewable energy.

ii. Electricity Grid alternative

The electricity grid is available within the settlement and will only require connecting the street lighting to electricity from the grid.

3.5.5 Evaluation criteria

The evaluation criteria for choosing the best design alternatives is provided in Table 7 below.

Table 8 - Design Evaluation Criteria

Sr. No	Criteria and weighting	Description
1	Technical Assessment **(30%)**	The technical criterion assesses route options in terms of geometry, degree of curvature, length of the road, drainage systems.
3	Social, political & Resettlement Assessment **(30%)**	This criterion assesses road options in relation to parameters such as population, number of encroachments.
4	Road Safety **(20%)**	The following design criteria which are linked to road safety were used to assess the suitability of the alternative roads: a) Stopping and passing sight distances; b) Coordination of horizontal and vertical curves; c) Cross-sections; and, d) Carriageway and roadside safety treatments.
5	Cost **(20%)**	The aim is to select the roads with the least lifetime construction and maintenance cost per unit of investment. In other words, the alternative that give the highest Net Present Value per Unit Cost of Investment. The economic evaluation was undertaken using the internationally recognized HDM-4, and will incorporate environmental and road safety costs and savings in the analysis.

CHAPTER 4: POLICY, LEGAL FRAMEWORK AND INSTITUTIONAL SETUP

4.1 Introduction

In regards to this Project, various policies and legal instruments were relevant to this ESIA study. These were both Government of Kenya policies and legal instruments (including those international ones domesticated by Kenya), and World Bank policies. These are found in Sections 3.5, 3.6, 3.7 and 3.8 below.

4.2 The Project in Context

Informal settlements constitute between 40 and 70% of the population in all major urban centres in Kenya. These settlements are characterized by poor infrastructure, poor provision of water and sanitation services. The Government of Kenya (GoK) has responded to the Vision 2030 and the recommendation of the "Kenya Economic Recovery for Wealth and Employment Creation (2003 - 2007)", by upgrading of informal settlements. This is exemplified by the Kenya Informal Settlements Improvement Project Phases I and II.

4.3 Policy and Legal Issues

Many of Kenyan national policies and laws were formulated to cater for environmental and sustainable development. The Environmental Management and Co-ordination Act (1999) deals specifically with all matters relating to the environment and has guidelines in how to carry an EIA in Kenya. These guidelines address the following major problems:

- Land degradation,
- Environmental pollution (noise, water, air, soil etc.),
- Lack of accessible, good quality water,
- Loss of wildlife habitats and biodiversity,
- Deforestation,
- Deterioration of aquatic ecosystems,
- Public health, and
- Climate change.

The major laws and regulations include the Constitution of Kenya 2010; the Environment Management and Coordination Act (Cap 387); Environmental Impact Assessment and Audit Regulations (2003); The Public Health Act (Cap 242); The Physical and Land Use Planning Act 2019; The Occupational Safety and Health Act 2007; The County Governments Act 2012; The Building Code (Adoptive By-laws) 1968; The National Environment Policy Session paper No. 10 of 2014; the Environment and Land Court Act, 2011; Climate Change Act, 2019; County Government Act, 2012; Labour Relations Act, 2016, Children Act, 2001; the Public Participation Act, 2016; etc.

4.4 The Need for an ESIA

According to the Kenya National Environment Action Plan (NEAP, 1994) the Government recognized the negative impacts on ecosystems emanating from industrial, economic and social development programmes that disregarded environmental sustainability. Following on this, establishment of appropriate policies and legal guidelines as well as harmonization of the existing ones have been accomplished and/or are in the process of development. The NEAP process introduced environmental assessments in the country with among the key stakeholders being industrialists, business community and local authorities. This culminated into the development of the Policy on Environment and Development under the Sessional Paper No. 6 of 1999. This also led to the enactment of EMCA 1999. Environmental Impact Assessment is a tool for ensuring

new projects and programmes incorporate appropriate measures to mitigate adverse impacts to the environment and peoples' health and safety as well as enhancing sustainable operations with respect to environmental resources and co-existence with other socio-economic activities in their neighbourhood. Necessary policies and legislation that ensures annual environmental audits (EA) are carried out on every running project, activity or programme and a report submitted to National Environmental Management Authority (NEMA) for approval and issuance of relevant certificates/licences. An EIA is done before the development or project begins. EIA is carried out by an Environmental Impact Assessment/ Environmental Audit (EIA/EA) expert duly registered and licensed by the National Environment Management Authority (NEMA).

4.5 Policy Provisions

National Environment Action Plan (NEAP)

According to the Kenya National Environment Action Plan (NEAP, 1994) the Government recognized the negative impacts on ecosystems emanating from economic and social development programmes that disregarded environmental sustainability. In this regard, establishment of appropriate policies and legal guidelines as well as harmonization of the existing ones have been accomplished and/or are in the process of development. Under the NEAP process EIA was introduced and among the key participants identified were the District Development Committees.

National Policy on Water Resources Management and Development

The National Policy on Water Resources Management and Development (Sessional Paper No. 1 of 1999) was established with an objective to preserve, conserve and protect available water resources and allocate it in a sustainable rational and economic way. It also desires to supply water of good quality and in sufficient quantities to meet the various water needs while ensuring safe disposal of wastewater and environmental protection. The policy focuses on streamlining provision of water for domestic use, agriculture, livestock development and industrial utilization with a view to realizing the goals of the Millennium Development Goals (MDGs) as well as Vision 2030. To achieve these goals, water supply (through increased household connections and developing other sources) and improved sanitation is required in addition to interventions in capacity building and institutional reforms.

While the National Policy on Water Resources Management and Development (1999) enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as waste water. It, therefore, calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. Development projects, therefore, should be accompanied by corresponding waste management systems to handle the waste water and other waste emanating there from. The same policy requires that such projects should also undergo comprehensive EIAs that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighbourhood and further downstream are not negatively impacted by the emissions. In addition, the policy provides for charging levies on waste water on quantity and quality (similar to polluter-pays-principle) in which case those contaminating water are required to meet the appropriate cost on remediation, though the necessary mechanisms for the implementation of this principle have not been fully established under the relevant Acts. However, the policy provides for establishment of standards to protect the water bodies receiving waste water, a process that is ongoing.

Sessional Paper No. 6 of 1999 on Environment and Sustainable Development

Among the key objectives of the Sessional Paper No. 6 of 1999 on Environment and Sustainable Development (1993) are:

i. To ensure that from the onset, all development policies, programmes and projects take environmental considerations into account.
ii. To ensure that an independent environmental impact assessment (EIA) report is prepared for any development before implementation.
iii. To ensure that effluent treatment standards which will conform to acceptable health standards.

This paper provided the basis for the environmental Policy framework that is in the process of formulation. Under this paper, broad categories of development issues have been covered that require sustainable approach. These issues include the waste management and human settlement sectors. The paper recommends the need for enhanced re-use/recycling of residues including wastewater and increased public awareness raising and appreciation of clean environment as well as the participation of stakeholders in the management of wastes within their localities. Regarding human settlement, the paper encourages better planning in both rural and urban areas and provision of basic needs such as water, drainage and waste disposal facilities among others for decent housing of every family.

The Land Policy

Among the philosophies behind the land policy is that land presents multiple values that should be protected by law and that it is a finite resource that should be utilized sustainably. It also recognizes the values of productivity and environmental sustainability among others. Land use management issues in urban and rural areas has been of concern due to rapid urbanization, inadequate land use planning, unsustainable production, poor environmental management and inappropriate ecosystem protection and management. This compromises benefit-sharing concepts of integrating economic, social and environmental aspects of land use activities.

Land use planning is required to address strategies for human settlement in relation to environmental conservation among other aspects as well as efficient and sustainable utilization and management of land and land-based resources. Among measures for restoration and conservation of land include control of land degradation through abuse of inputs and inappropriate land use practices. Environmental management principles captured in these measures are conservation and sustainable management, ecosystem protection, urban environment management and environmental assessments and audits.

Vision 2030

Vision 2030 is a government development strategy that is aimed at steering Kenya to a middle-income country by the year 2030. It is based on the 3 pillars of political, social and economic advancement and it aims to transform the economy to newly industrialized status by 2030 and achieve sustainable growth. Environmental considerations of development are contained within the social and economic pillar. On poverty reduction, the vision aims at creating opportunities for the poor by making institutions stronger. The vision recognizes the significance of public sector reform as a key enabler. The sector was to be transformed by building and implementing service delivery systems that ensure efficiency, quality, speed, convenience, and dignity in service delivery as well as being globally competitive. This is also in line with the Economic Recovery Strategy for Wealth and Employment Creation (ERS) which addresses issues of promoting sustainable livelihoods in marginalized areas.

By upgrading the water and sanitation status of the slums, KISIP will be assisting the country to provide clean domestic water and better sanitation facilities for the urban poor and therefore help attain the goals of Vision 2030 and the UN's SDGs.

The National Environment Policy Sessional Paper No. 10 of 2014

The policy provides comprehensive strategies for government action regarding the quality of the environment and development. The project will have to comply with the policy by integrating of environmental sustainability principles during implementation, operation, and decommissioning stages.

National Gender and Development Policy (2000)

The overall objective of the Gender and Development Policy is to facilitate the mainstreaming of the needs and concerns of men and women in all areas in the development process in the country. The construction sector plays a key role in socio-economic development. Deliberate and affirmative action to encourage all genders to contribute to the proposed subproject activities has been inculcated in the ESMP. The Project provides an opportunity for the engendering of the construction sector as a means towards poverty reduction and inclusive socio-economic development.

Private Sector Development Strategy 2006-2010

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

The Project will spur private sector investments in the slums areas and that of the national economy in general by provision of infrastructure such as access roads, lighting and clean domestic waters, better sanitation and drainage.

National Poverty Eradication Plan (NPEP), Poverty Reduction Strategy Paper (1999) on Environment and Development and Sessional Paper for Sustainable Development (No 1 of 2002)

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

The Strategy Paper on Environment and Development was published by the Government in 2001. The two key goals of the strategy are poverty reduction and economic growth. The document outlines the priorities and measure necessary for poverty reduction and economic growth. The objectives of economic growth and poverty reduction are borne out of realization that economic growth is not a sufficient condition to ensure poverty reduction. In this regard, measures geared towards improved economic performance and priority actions that must be implemented to reduce

the incidence of poverty among Kenyans have been identified. With respect to the environment, the paper proposes that adequate awareness be created among stakeholders regarding environmental costs and benefits. It further calls for community involvement and participation in environmental management and conservation.

This Sessional Paper for Sustainable Development (No. 1 of 2002) which is an update of Sessional Paper Number 4 of 1984 on population policy guidelines, addresses issues on environment, gender, poverty and problems faced by segments of the population including the youth, the elderly and persons with disabilities. Outlined in the paper are population and development goals and objectives including improvement on standards of living and quality of life of the people; full integration of population concerns into development process; motivating and encouraging Kenyans to adhere to responsible parenthood; and empowerment of women.

By upgrading the infrastructure of the slums, KISIP II will be assisting the country to provide clean better access roads, lighting, domestic water and better drainage and sanitation facilities for the urban poor and therefore help attain the goals of Vision 2030 and the UN's SDGs. The project will also spur private sector investments in the project areas and that of the national economy in.

The National Policy on Water Resources Management and Development (1999)

The National Policy on Water Resources Management and Development (1999) seeks to enhance a systematic development of water facilities in all sectors for the country's socio-economic progress, and therefore calls for development of appropriate sanitation systems to protect people's health and water resources from pollution. It also sets guidelines for the utilization of water resources to prevent overexploitation and depletion of the resource.

Development projects, therefore, should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating there from. The policy also requires that such projects should undergo comprehensive Environmental Impact Assessments that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighbourhoods and further downstream are not adversely affected by any emissions or discharges.

Physical Planning Policy

The local Authorities are empowered under section 29 of the Physical Planning Act Cap 286 to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section, therefore allows for the prohibition or control of the use and development of land and buildings in the interest of proper and orderly development of an area. Section 36 states that, if in connection with a development application, the local Authority is of the opinion that the proposed development activity will have a injurious impact on the environment, the applicant shall be required to submit together with the application an Environmental Impact Assessment EIA report. The proposed project is in complete cognizance with the provisions of the Physical Planning Act.

Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. Kenya has domesticated these goals in its development agenda. These 17 Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The goals are inter-connected – often the key to success on one will

involve tackling issues more commonly associated with another. The SDGs work in the spirit of partnership and pragmatism to make the right choices now to improve life, in a sustainable way, for future generations. They provide clear guidelines and targets for all countries to adopt in accordance with their own priorities and the environmental challenges of the world at large. The SDGs are an inclusive agenda. They aim to tackle the root causes of poverty and unite us together to make a positive change for both people and planet.

National Climatic Change Response Strategy (NCCRS)

Climate change is considered one of the most serious threats to sustainable development globally. Studies have shown that about 90% of all natural disasters afflicting the world today are related to severe weather and extreme climate change events. Impacts of the projected climate change are expected in many sectors such as environment, human health, food security, economic activities, natural resources and physical infrastructure. Kenya acknowledges that the change in the Earth‘s climate and its adverse effects are a common concern of humankind. The Ministry of Environment and Climate Change and Forestry has therefore recognized the need to enhance coordination of climate change activities in the country with a view to ensuring a climate-proof socioeconomic development anchored on a low carbon path. The vision of the Strategy is for a prosperous and climate change resilient Kenya. The mission is to strengthen and focus nationwide actions towards climate change adaptation and GHG (greenhouse gases) emission mitigation. This will be achieved by ensuring commitment and engagement of all stakeholders while taking into account the vulnerable nature of Kenya‘s natural resources and society at large.

The objectives are to:

- Enhance understanding of the global climate change regime: the negotiation process, international agreements, policies and processes and most importantly the positions Kenya needs to take in order to maximize beneficial effects of climate change,
- Assess the evidence and impacts of climate change in Kenya,
- Recommend robust adaptation and mitigation measures needed to minimize risks associated with climate change while maximizing opportunities,
- Enhance understanding of climate change and its impacts nationally and in local regions,
- Recommend vulnerability assessment, impact monitoring and capacity building framework needs as a response to climate change,
- Recommend research and technological needs to respond to climate change impacts, and avenues for transferring existing technologies,
- Recommend a conducive and enabling policy, legal and institutional framework to combat climate change, and
- Provide a concerted action plan coupled with resource mobilization plan and robust monitoring and evaluation plan to combat climate change.

Table 9 - Relevance of National Environmental and Social Framework

	Policy	Policy Brief	Policy relevance to the Project
1	National Environment Action Plan (NEAP)	Under the NEAP process EIA was introduced and among the key participants identified were the District Development Committees.	The Project will trigger the requirement of EIA study for the project
2	National Policy on Water Resources Management and Development	Objective is to preserve, conserve and protect available water resources and allocate it in a sustainable rational and economic way. To achieve this objective, water supply (through increased household connections and developing other sources) and improved sanitation is required in addition to interventions in capacity building and institutional reforms.	The Project will trigger the requirements contained in this Policy as pertains to infrastructure development in the Settlement.
3	Sessional Paper No. 6 of 1999 on Environment and Sustainable Development	Under this paper, broad categories of development issues have been covered that require sustainable approach. These issues include the waste management and human settlement sectors. Regarding human settlement, the paper encourages better planning in both rural and urban areas and provision of basic needs such as water, drainage and waste disposal facilities among others for decent housing of every family.	The Project will trigger the requirements contained in this Policy as pertains to infrastructure development in the Settlement.
4	The Land Policy	The essence of this policy is that land presents multiple values that should be protected by law. It calls for proper land use planning in urban and rural areas due to rapid	The Project will trigger the requirements contained in this Policy as pertains to infrastructure development, land use planning, etc. in the Settlement.

	Policy	Policy Brief	Policy relevance to the Project
		urbanization, inadequate land use planning, unsustainable production, poor environmental management and inappropriate ecosystem protection and management.	
5	Vision 2030	Environmental considerations of development are contained within the social and economic pillar. On poverty reduction, the vision aims at creating opportunities for the poor by making institutions stronger.	By upgrading the water and sanitation status of the slums, KISIP will be assisting the country to provide clean domestic water and better sanitation facilities for the urban poor and therefore help attain the goals of Vision 2030 and the UN's SDGs.
6	The National Environment Policy Sessional Paper No. 10 of 2014	The policy provides comprehensive strategies for government action regarding the quality of the environment and development.	The project will have to comply with the policy by integrating of environmental sustainability principles during implementation, operation, and decommissioning stages.
7	National Gender and Development Policy (2000)	The overall objective of the Gender and Development Policy is to facilitate the mainstreaming of the needs and concerns of men and women in all areas in the development process in the country.	The construction sector plays a key role in socio-economic development. Deliberate and affirmative action to encourage all genders to contribute to the proposed subproject activities has been inculcated in the ESMP. The Project provides an opportunity for the engendering of the construction sector as a means towards poverty reduction and inclusive socio-economic development.
8	Private Sector Development Strategy 2006-2010	The strategy focuses on improving Kenya's business environment, institutional transformation, trade expansion, improved productivity and support to entrepreneurship and	The Project will spur private sector investments in the slums areas and that of the national economy in general by provision of infrastructure such as access roads, lighting and clean domestic waters, better sanitation and drainage.

	Policy	Policy Brief	Policy relevance to the Project
		indigenous enterprise development. One of the key factors for the improvement of productivity is the adoption of modern, appropriate technologies.	
9	National Poverty Eradication Plan (NPEP), Poverty Reduction Strategy Paper (1999) on Environment and Development and Sessional Paper for Sustainable Development (No 1 of 2002)	The plan focuses on the four themes of the poverty eradication; reduction of unemployment; social integration of the disadvantaged people and the creation of an enabling economic, political, and cultural environment.	By upgrading the infrastructure of the slums, KISIP II will be assisting the country to provide clean better access roads, lighting, domestic water and better drainage and sanitation facilities for the urban poor and therefore help attain the goals of Vision 2030 and the UN's SDGs. The project will also spur private sector investments in the project areas and that of the national economy in.
10	The National Policy on Water Resources Management and Development (1999)	This Policy seeks to enhance a systematic development of water facilities in all sectors for the country's socio-economic progress, and therefore calls for development of appropriate sanitation systems to protect people's health and water resources from pollution.	The policy also requires that such projects should undergo comprehensive Environmental Impact Assessments that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighbourhoods
11	Physical Planning Policy	The local Authorities are empowered by the Policy to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. For a development to be approved, if the local Authority is of the opinion that the proposed development activity will have a injurious impact on the environment, the applicant shall be required to submit together with the application	The Project will trigger the requirements contained in this Policy as pertains to infrastructure development, land use planning, etc. in the Settlement.

	Policy	Policy Brief	Policy relevance to the Project
		an Environmental Impact Assessment EIA report	
12	Sustainable Development Goals (SDGs)	The major objective of these Goals is to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. They aim to tackle the root causes of poverty and unite us together to make a positive change for both people and planet.	The Project will trigger the requirements contained in these Goals as pertains to infrastructure development, land use planning, reduction of poverty, etc. in the Settlement.
13	National Climatic Change Response Strategy (NCCRS)	Climate change is considered one of the most serious threats to sustainable development globally. The vision of the Strategy is for a prosperous and climate change resilient Kenya. The mission is to strengthen and focus nationwide actions towards climate change adaptation and GHG (greenhouse gases) emission mitigation.	The Project will trigger the requirements contained in this Strategy as pertains to infrastructure development, land use planning, etc. in the Settlement. This is considered in the ESMP.

4.6 Legal Framework

The EIA guidelines available for Kenya, especially the EMCA 1999 and NEMA Environmental Impact and Audit Regulations 2003, were closely followed in this ESIA. Awareness regarding the relationship between the environment and economic development in Kenya continues to grow since 1992 when Kenya joined the rest of the world in endorsing Agenda 21 as the global blueprint for sustainable development. To this end Kenya has recognized the need for mainstreaming environmental issues in all aspects of its economic development. This will ensure that the project is environmentally sustainable and will result in minimal environmental hazards. To summarize, the following are some of the various legal and policy instruments dealing with environment as an integral part of national development.

Applications of national statutes and regulations on environmental conservation suggest that the proposed project management institutions will have a legal duty and social responsibilities to ensure the proposed project development is carried out without compromising the status of the natural resources in the area, public privacy, health and safety. This position enhances the importance of this environmental impact assessment for the proposed site to provide a benchmark for its sustainable operation. The key national laws that govern the management of environmental resources in the country have been briefly discussed below. It is noteworthy that wherever any of

the laws contradict each other, the Environmental Management and Co-ordination Act 1999 prevails.

The Constitution of Kenya (2010)

The constitution of Kenya was promulgated in 2010. Several articles are relevant to the proposed project in relation to the environment. Article 42 states that, every person has the right to a clean and healthy environment, which includes the right:

a) To have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and
b) To have obligations relating to the environment fulfilled under Article 70.

Article 69: Obligations in Respect to the Environment

The Article provides that the State shall:

a) Ensure sustainable exploitation, utilization, management, and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits.
b) Work to achieve and maintain a tree cover of at least ten percent (10%) of the land area of Kenya.
c) Protect and enhance intellectual property and indigenous knowledge of biodiversity and the genetic resources of the communities.
d) Encourage public participation in the management, protection, and conservation of the environment.
e) Protect genetic resources and biological diversity.
f) Establish systems of Environmental Impact Assessment, Environmental Audits and monitoring of the environment, processes and activities that are likely to endanger the environment; and
g) Utilize the environment and natural resources for the benefit of all the people.

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

Article 70: Enforcement of Environmental Rights

1. It stipulates that: If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.
2. On application under clause (1), the court may make any order or give any directions, it considers appropriate:

a) To prevent, stop or discontinue any act or omission that is harmful to the environment;
b) To compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or to provide for compensation for any victim of a violation of the right to a clean and healthy environment. For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.

The Environment Management and Co-ordination Act, 1999 (Amended 2015)

EIA is a legal requirement in Kenya rooted in the constitution. Chapter 69 of the Constitution of Kenya lists obligations in respect of the environment. The state must establish systems of environmental impact assessment, environmental audit, and environmental monitoring. The state must also eliminate processes and activities likely to endanger the environment. Consequently,

the National Assembly of the Republic of Kenya has developed several laws to establish systems and guide the environmental impact assessment process in Kenya. The Environmental Management and Coordination Act (EMCA) 1999 (Cap 387 of the laws of Kenya), Environmental (Impact Assessment and Audit) Regulations 2003, Environmental Management and Coordination Act (Amendment) Act 2015, and Environmental (Impact Assessment and Audit) (Amendment) Regulations 2019, are some of these laws.

Finally, the environmental impact assessment guidelines require that EIA be conducted in accordance with the issues and general guidelines spelt out in the second and third schedules of the regulations. These include coverage of the issues on schedule 2 (ecological, social, landscape, land use and water considerations) and general guidelines on schedule 3 (impacts and their sources, project details, national legislation, mitigation measures, a management plan and environmental auditing schedules and procedures.

This ESIA is in compliance with Section 58 of the Environmental Management and Coordination Act (EMCA) No.8 of 1999 Second Schedule Part 3 (a), and the Environment (Impact Assessment and Audit) Regulations 2003 and 2019. Environmental quality conservation aspects of this project will be realized through the implementation of the Environmental and Social Management Plan aimed at mitigating the potentially negative impacts and enhancing the potentially positive impacts predicted through this ESIA study.

Factories and Other Places of Work Act Cap 514

The Factories and Other Places of Work Act Cap 514 makes provision for the health, safety and welfare of persons employed in factories and other places of work. The provisions require that all practicable measures be taken to protect persons in places of work from dust, fumes or impurities originating from any process within the workplace. The provisions of the Act are also relevant to the management of hazardous and non-hazardous wastes, which may arise at a project site. The proponent will appoint a reputable contractor who will be responsible in enforcing the requirements during construction and subsequent repairs and maintenance after project completion.

The Occupational Health and Safety Act (OSHA), 2007

This legislation provides for protection of workers (employees) during pre-construction and construction phases. It is tailored at implementation of the EHS plan in compliance with the relevant sections of this Act. The Occupational Safety and Health Act 2007 applies to any work place. The Act requires that the operator of premises or works prepares a written statement of his general policy with respect to safety and health at work of his employees. This statement must be made available to the employees. Health and safety provisions covers, among others, cleanliness, ventilation, lighting, safe use of plant and machinery, fire prevention, dangerous fumes, safety provisions, first aid, control of air pollution, noise and vibration.

Regarding the handling, transportation and disposal of chemicals and other hazardous substances, there shall be classification of hazardous materials and chemicals, and the materials data sheet should be maintained. The occupier of a workplace shall cause a thorough safety and health audit of his workplace to be carried out at least once in every period of twelve months by a safety and health advisor, who shall issue a report of such an audit containing the prescribed particulars to the occupier on payment of a prescribed fee and shall send a copy of the report to the Director. The audit report shall be preserved and be kept available for inspection by the occupational safety and health officer.

Work Injury Benefits Act 2007 (WIBA)
This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes.

National Museums of Kenya Act
National Museums of Kenya is a state corporation charged with research, management and documentation of historical sites, archaeological sites and site of natural and national heritages and monuments. National Museums of Kenya has also been designated as a national biodiversity centre and is involved in taxonomic and herbaria activities. Any archaeological item of note will be referred to the National Museums of Kenya for documentation and safe keeping.

Land Acquisition Act Cap 295
This Act provides for the compulsory or otherwise acquisition of land from private ownership for the benefit of the general public. Section 3 states that when the Minister is satisfied on the need for acquisition, notice will be issued through the Kenya Gazette and copies delivered to all the persons affected. Full compensation for any damage resulting from the entry onto land to things such as survey upon necessary authorization will be undertaken in accordance with section 5 of the Act.

The Act applies where public interests override private interests as indicated in Chapter 7 of the Constitution of Kenya. The initiatives and procedures of acquisition are set out in the Act and the following highlights are notable:

- The Minister has to be satisfied that the land required is for public purpose by a public body before he directs the Commissioner of Lands to acquire it compulsorily.
- The Commissioner of Lands then publishes the notice of acquisition.
- The Commissioner holds an inquiry for hearing of claims by persons interested in the land.
- The Act recommends that full compensation to be paid promptly to all persons interested in the land.

Due to the fact that water pipes and sewerage line will follow the public road networks in the settlement areas, the government may not have the need to acquire land and compensate the owners accordingly.

Wayleaves Act Cap 292
The Act provides for certain undertakings to be constructed e.g. transmission lines, dams, canals, pathways etc., through, over or under any lands. Section 3 of the Act states that the Government may carry any works through, over or under any land whatsoever provided it shall not interfere with any existing building or structures of an on-going activity. Where any developments are affected, the Act recommends for compensation under Section 6 (1) - “the Government shall make good all compensation to the owner of any tree or crops destroyed or damaged”. The Act further explains the process of resolving conflicts that arise in determining the compensation value. Due to the fact that water pipes and sewerage line will follow the public road networks in the slum areas, the government may not have to acquire land and compensate the owners accordingly.

Government Lands Act Cap 280
This is an Act of Parliament to make further and better provision for regulating the leasing and other disposal of Government lands, and for other purposes. Under this act the President through the Commissioner of Lands, allocates any un-alienated land to any person he so wishes

("unalienated Government land" means Government land which is not for the time being leased to any other person, or in respect of which the Commissioner has not issued any letter of allotment). Such a land once allocated is held as a grant from the government on payment of such rents to the government as the government wishes. This is now subject to the provisions of the new Constitution of Kenya 2010. By invoking the provisions of this Act, it will ensure proper use of land within the provisions of the Act.

Registered Land Act Cap 300

This Act provides for the absolute proprietorship over land (exclusive rights) in Kenya. Under this Act any person may acquire absolute ownership to any land once he or she has been registered as the absolute owner under the Act. On registration such a person acquires freehold interests on the land which implies absolute ownership. By invoking the provisions of this Act, it will ensure proper use of land within the provisions of the Act.

Land Control Act 302

This Act restricts transfer of land and as such has some bearing on the flexibility with which affected farmers can acquire replacement land. The most pertinent section of this act is Section (9) that states the economic size for agriculture. It controls the subdivisions of the agricultural land. The Land Control Act Cap 406 allows for all private land to be adjudicated and registered following which, a title deed is issued to the registered owner. Acquisition of private land is through transfer of the Title Deed either on account of inheritance, purchase or free gift but in all cases, transfers must be registered with the District Land Registrars following approval by the Land Control Boards. By invoking the provisions of this Act, it will ensure proper use of land within the provisions of the Act.

Physical Planning Act Cap 286

This Act provides for the preparation and implementation of physical development plans for connected purposes. It establishes the responsibility for the physical planning at various levels of Government in order to remove uncertainty regarding the responsibility for regional planning. A key provision of the Act is the requirement for Environmental Impact Assessment (EIA).

It provides for a hierarchy of plans in which guidelines are laid down for the future physical development of areas referred to in a specific plan. The intention is that the three-tier order plans, the national development plan, regional development plan, and the local physical development plan should concentrate on broad policy issues. The Act also promotes public participation in the preparation of plans and requires that in preparation of plans proper consideration be given to the potential for socio-economic development needs of the population, the existing planning and future transport needs, the physical factors which may influence orderly development in general and urbanization in particular, and the possible influence of future development upon natural environment. Any change of use of the actual development without authority constitutes an offence.

KISIP II will need to work closely with the local authorities and other relevant government departments to ensure that there is proper utilization of land and its resources within the project area. This will entail proper planning for facilities, etc.

Energy Act 2006

This Act consolidated the laws relating to energy, provides for the establishment, powers and functions of the Energy Regulation Commission and the Rural Electrification Authority; and for

connection purposes. Section 54 of the Act provides how land can be acquired if the Minister in consultation will the Energy Regulation Commission is satisfied that the land is needed for public benefit. Working closely under the provisions of this Act, KISIP will ensure safe distribution of power lines and other facilities in the project areas.

Agriculture Act

The Agriculture Act Cap 318 of the Laws of Kenya seeks to promote and maintain a stable and sustainable agriculture, to provide for the conservation of the soil and its fertility and to stimulate the development of agricultural land in accordance with the accepted practices of good land management and good husbandry. This Act primarily guides and regulates farming practices especially in relation to the proximity of farming within the riparian section. The Act specifies that no agricultural activity is allowed and or permitted within the riparian area of a wetland, river or Lake. The Agriculture Act is the principal land use statute covering, *inter- alia,* soil conservation, and agricultural land use in general. County Government together with relevant government arms will ensure that proper agricultural practices are put in place in the project area and cut down the use of sewerage for farming. These will include adhering to the set areas of riparian zones in order to reduce soil erosion and sedimentation of water bodies.

Public Health Act Cap 242

The Public Health Act has no environmental protection standards. The Act is primarily concerned with the protection of the quality of water supplies and sources used for human, domestic and animal consumption. It contains provisions against environmental pollution by what it describes as “nuisance” that would result in the pollution of the environment by gaseous emissions, solid wastes and liquid effluent in order to protect public health. The Proponent and the contractor are legally bound by this Act to prevent this from happening.

The Act protects human health. It prevents and guards against introduction of infectious diseases into Kenya from outside, promotes public health as well as the prevention, limitation or suppression of infectious, communicable or preventable diseases within Kenya. Its objective is also to advice and direct local authorities in regard to matters affecting the public health to promote or carry out researches and investigations in connection with the prevention or treatment of human diseases. This Act provides the impetus for a healthy environment and gives regulations to waste management, pollution and human health.

This act provides for securing and maintaining health. This Act defines what an environmental nuisance is and this includes emissions of wastes, gases, smoke and the general pollution of land, air and water. During the construction of the bridge, it is likely that wastes and accidents may occur. Section 118 (c) deems it a nuisance for any street , road, or any part thereof, any stream, pool, ditch, gutter, watercourse, sink, water tank etc. so foul or in such a state or so situated or constructed as in the opinion of the medical officer of health to be offensive or to be injurious or dangerous to human health. Street here includes bridges, footway, square, court, alley etc.

Lakes and Rivers Act (Cap 409)

The Lakes and Rivers Act provides for the protection of rivers, lakes and associated flora and fauna. The provisions of this Act therefore have to be applied in the management of rivers that will be within by the proposed project.

Water Act 2002

The Water Act (2002) of the Laws of Kenya seeks to make better provision for the conservation, control of pollution, apportionment and use of the water resources in Kenya, and for purposes they are incidental thereto and connected therewith. The Act vests ownership and control of water in the government subject to any rights of user. Under this provision the responsibility to regulate access, use and control of water resources is vested in the Water Resources Management Authority (WRMA).

The Act vests the rights of all water to the state, and the power for the control of all body of water with the Cabinet Secretary, the powers is exercised through the Cabinet Secretary and the Water Resources Authority in consultation with the regional water resources boards. It provisions aim at the conservation of water, apportionment, and use of water resources. Part II, section 18, of the Principal Act provides for national monitoring and information archiving system on water resources. Following on this, sub-section 3 allows the Water Resources Authority (WRA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may require to be kept by a facility operator and the information thereof furnished to the authority.

Section 25 of the Act requires a permit to be obtained for any use of water from a water resource, and the discharge of a pollutant into any water resource. Under Section 29, application for such a permit shall be subject to public consultation as well as an Environmental Impact Assessment in line with the Environmental Management and Coordination Act, Cap 387. The conditions of the permit may also be varied if the Authority is of the opinion that the water so used is causing deterioration of water quality or causing shortage of water for other purposes for which the Authority lays a higher priority. This is provided for under section 35 of the Act.

Section 73 of the Act allows a person, who has been granted a license to supply water (licensee), to make regulations for purposes of protecting against degradation of their water source(s). Under the Section, the licensee could be a local authority, a private Trust or an individual, and enforcement will under the supervision of the Regulatory Board with jurisdiction. Section 76 states that no person shall discharge any trade effluent from any trade premises into sewers of a licensee without the consent of the licensee upon application indicating the nature and composition of the effluent, maximum quantity anticipated, flow rate of the effluent and any other information deemed necessary. The consent shall be issued on conditions including the payment rates for the discharge as may be provided under section 77 of the same Act.

The proposed project shall require large quantities of water during the construction phase and generation of equally large volumes of surface run-off during construction and operations. The contractor shall seek the necessary permits to obtain water and shall abide by the conditions attached to the permit(s).

The Act protects water bodies and sources from pollution and controls their use. The Act also gives provisions for protecting catchments from deforestation. The Minister may designate protected catchment areas, within which activities may be regulated. However, the Water Act does not provide for control of other land uses that may degrade the catchment through soil erosion. The Agriculture Act, on the other hand, does provide a framework for dealing with these problems, although these provisions seem rarely to be implemented. Control of water pollution is covered in a general sense by the Water Act. The legislation is deficient, since it does not lay down water quality and discharge standards or provide powers for these to be defined. It also does not provide for water quality monitoring. The Public Health and Pest Control Products Acts

also touch directly or indirectly on water pollution, but there is little institutional capacity to implement their provisions.

This will ensure proper use of water resources within the project area and mitigate against water pollution by residents/activities.

KISIP II will need to encourage proper utilization and use of the water resources to ensure provision of clean water suitable for domestic use by curbing water misuse and pollution.

The Penal Code (Cap 63)

Section 191 of the Penal Code states that if any person or institution that voluntarily corrupts or foils, water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offense. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to the health of persons/institution, dwelling or business premises in the neighbourhood or those passing along public way, commits an offense. The vitiation of the atmosphere, corruption of and foiling of the water springs is not an inherent quality of the proposed project's nature. None the less the operational aspects of the project have significantly foreseeable negative impacts. Enforcement of this Act in complimentary with all the aforementioned environmental systems, conserving policies and specific Acts will achieve the desired goals and objectives in this respect. The officers of County Government with jurisdiction will exercise due diligence.

Climate Change (Amendment) Act 2023

The Act applies to the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya. Without prejudice to subsection (1), the Act is applicable in all sectors of the economy by the national and county governments to: mainstream climate change responses into development planning, decision making and implementation; build resilience and enhance adaptive capacity to the impacts of climate change; formulate programs and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change; mainstream and reinforce climate change disaster risk reduction into strategies and actions of public and private entities; promote low carbon technologies, improve efficiency and reduce emissions intensity by facilitating approaches and uptake of technologies that support low carbon, and climate resilient development; facilitate capacity development for public participation in climate change responses through awareness creation, consultation, representation and access to information; mobilize and transparently manage public and other financial resources for climate change response; provide mechanisms for, and facilitate climate change research and development, training and capacity building; mainstream the principle of sustainable development into the planning for and decision making on climate change response; and integrate climate change into the exercise of power and functions of all levels of governance to enhance cooperative climate change governance between the national and county governments.

Wildlife Conservation and Management Act Cap 376

The Act and its related amendments regulate wildlife conservation within the country. The Act also created the Kenya Wildlife Service in 1997 and gives the agency the power to oversee the establishment and management of the Parks and reserves in Kenya and undertake to protect the fauna and flora within the National parks including entering into agreements with organizations of person to ensure that wildlife corridors continue to be provided for migration of wildlife. Alienation of any park can only be undertaken by a resolution from parliament. The Act gives KWS the

powers to maintain an armed wing and provides the sweeping powers for the organization to enter into premise search and arrest anybody handling live or dead animal or part of animal and prosecute in a court of law.

Urban and Cities (Amendment) Act 2019

The Act came into function with regard to Article 184 of the Constitution providing regulations on the classification, governance and management of urban areas and cities and further providing the criteria of establishing urban areas. Part III of the Act gives the regulations and functions of every city or municipality with regard to integrated development plans, which shall include but not limited to environmental plans and disaster preparedness, within the area of jurisdiction in achieving objects of devolved governments under section 174 of the constitution while maintaining the socio-economic rights of the people. Moreover, in the first schedule, the Act enlists the services that any municipality shall provide to its residents which include but not limited to traffic control and parking, water and sanitation, refuse collection, solid waste management, pollution abatement services among others.

County Government Act, 2012

Section 109 of the County Government Act (2012) helps counties to ensure effective coordination of spatial developments. Sub - section (2) part C states in part; a spatial county plan shall:

- Indicate desired patterns of land use within the county;
- Address the spatial construction or re-construction of the county;
- Provide strategic guidance in respect of the location and nature of development within the county;
- Set out basic guidelines for a land use management system in the county taking into account any guidelines, regulations or laws as provided for under Article 67(2) (h) of the Constitution;
- Set out a capital investment framework for the county's development programs; and Contain a strategic assessment of the environmental impact of the spatial development framework.

The National Construction Authority Act (NCA), 2011

The National Construction Authority Act, Number 41 of 2011 is set to streamline, overhaul and regulate the construction industry in Kenya. The industry has for many years suffered poor legislative framework and has been dominated by quacks and unqualified persons. The industry has also suffered a lot of competition from foreign contractors who are seen to offer cheaper and more quality work. The new Act is a win for the public as it guarantees public safety. All contractors must be registered with the Authority (NCA), meaning that shady contractors and quacks will be locked out of the industry. It is an offence to carry out any construction work without first having been registered with the Authority. The Contractor who will undertake the project will be one who is registered with NCA. The Act also outlines that every development projects must be registered and subsequent construction permit secured from the Authority prior to commencement of the project activities.

The Environment and Land Court Act, 2011

This is an Act of Parliament that gives effect to Article 162 (2) (b) of the Constitution to establish a superior court to hear and determine disputes relating to the environment and the use or occupation of land. The Environment and Land Court is one of the courts contemplated by article 162 (2). It is a Superior Court and has the same status as the High Court. The court is established under section 4 of the Environment and Land Court Act No. 19 of 2011. It has jurisdiction to hear

any other dispute relating to environment and land. The jurisdiction of the court is provided under section 13 of the Act.

The court has powers to deal with disputes relating to land administration and management. The court is also empowered to hear cases relating to public, private and community land and contracts or other instruments granting any enforceable interests in land. The court also exercises appellate jurisdiction over the decisions of subordinate courts or local tribunals in respect of matters falling within the jurisdiction of the Court. The court further exercises supervisory jurisdiction over the subordinate courts, local tribunals, persons or authorities in accordance with Article 165(6) of the
Constitution.

Employment Act 2007

This is an Act of parliament that applies to all employees employed by any employer under a contract of service. The Act came in operation in June 2008. Employment of children is prohibited under this Act.

The Labour Relations Act, 2007

The principal objective of this Act is to provide a legal framework to promote freedom of association and the right to collective bargaining, to streamline the registration process of trade unions, employees organizations and federation of trade unions and employers; organizations to provide mechanisms for the effective management of property, funds and accounts of trade unions, employers organizations and their respective federations, and to promote expedition and conclusive dispute settlements. It provides for establishment and registration of trade unions and employers organization. It sets out the procedure for the application and consequences of registration and also provides for suspension and cancellation of registration of trade unions and employers organizations.

Table 10 - Relevance of National Legal Framework on the Project

	Constitution/Act	Brief	Relevance to the Project
1	The Constitution of Kenya (2010)	The Constitution of Kenya 2010 is the principal law of the Country. Article 42 states that, every person has the right to a clean and healthy environment. *Article 69* Section (2) states that; every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.	EIA is a legal requirement in Kenya rooted in the constitution.

	Constitution/Act	Brief	Relevance to the Project
2	The Environment Management and Co-ordination Act, 1999 (Amended 2015)	EIA is a legal requirement in Kenya rooted in the constitution. Chapter 69 of the Constitution of Kenya lists obligations in respect of the environment. The environmental impact assessment guidelines require that EIA be conducted in accordance with the issues and general guidelines spelt out in the Second and Third Schedules of the Regulations.	This ESIA is in compliance with Section 58 of the Environmental Management and Coordination Act (EMCA) No.8 of 1999 Second Schedule Part 3 (a), and the Environment (Impact Assessment and Audit) Regulations 2003 and 2019. Environmental quality conservation aspects of this project will be realized through the implementation of the Environmental and Social Management Plan aimed at mitigating the potentially negative impacts and enhancing the potentially positive impacts predicted through this ESIA study.
3	Factories and Other Places of Work Act Cap 514	The Factories and Other Places of Work Act Cap 514 makes provision for the health, safety and welfare of persons employed in factories and other places of work. The provisions require that all practicable measures be taken to protect persons in places of work from dust, fumes or impurities originating from any process within the workplace.	The proponent will appoint a reputable contractor who will be responsible in enforcing the requirements during construction and subsequent repairs and maintenance after project completion.
4	The Occupational Health and Safety Act (OSHA), 2007	This legislation provides for protection of workers (employees) during pre-construction and construction phases. The Act requires that the operator of premises or works prepares a written statement of his general policy with respect to safety and health at work of his employees. This statement must be made available to the employees. Health and safety provisions covers, among	The Project will trigger the requirements contained in this Act as the Contractor will have to engage employees on the Project during Construction Phase.

	Constitution/Act	Brief	Relevance to the Project
		others, cleanliness, ventilation, lighting, safe use of plant and machinery, fire prevention, dangerous fumes, safety provisions, first aid, control of air pollution, noise and vibration. Regarding the handling, transportation and disposal of chemicals and other hazardous substances, there shall be classification of hazardous materials and chemicals, and the materials data sheet should be maintained.	The Project may use some hazardous materials especially during construction or roads, there by triggering provisions of this Act.
5	Work Injury Benefits Act 2007 (WIBA)	This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes.	During construction, the project sites will become place of work where people are engaged as employees. Hence the provisions of this Act will be triggered.
6	National Museums of Kenya Act	National Museums of Kenya is a state corporation charged with research, management and documentation of historical sites, archaeological sites and site of natural and national heritages and monuments.	Any archaeological item of note will be referred to the National Museums of Kenya for documentation and safe keeping.
7	Land Acquisition Act Cap 295	This Act provides for the compulsory or otherwise acquisition of land from private ownership for the benefit of the general public.	Due to the fact that water pipes will follow the public road networks in the settlement areas, the government may not have the need to acquire land and compensate the owners accordingly.
8	Wayleaves Act Cap 292	Section 3 of the Act states that the Government may carry any works through, over or under any land whatsoever provided it shall not interfere with any existing building or structures of an on-going activity.	Due to the fact that water pipes will follow the public road networks in the slum areas, the government may not have to acquire land and compensate the owners accordingly.
9	Government Lands Act Cap 280	This is an Act of Parliament to make further and better	By invoking the provisions of this Act, it will ensure proper

	Constitution/Act	Brief	Relevance to the Project
		provision for regulating the leasing and other disposal of Government lands, and for other purposes.	use of land within the provisions of the Act.
10	Registered Land Act Cap 300	This Act provides for the absolute proprietorship over land (exclusive rights) in Kenya. Under this Act any person may acquire absolute ownership to any land once he or she has been registered as the absolute owner under the Act.	By invoking the provisions of this Act, it will ensure proper use of land within the provisions of the Act. This will involve issuing of title deeds to the land owners.
11	The Land Control Act Cap 406	The Land Control Act Cap 406 allows for all private land to be adjudicated and registered following which, a title deed is issued to the registered owner.	By invoking the provisions of this Act, it will ensure proper use of land within the provisions of the Act. This will involve issuing of title deeds to the land owners.
12	Physical Planning Act Cap 286	This Act provides for the preparation and implementation of physical development plan. A key provision of the Act is the requirement for Environmental Impact Assessment (EIA).	By invoking the provisions of this Act, it will ensure proper use of land within the provisions of the Act.
13	Energy Act 2006	This Act consolidated the laws relating to energy, provides for the establishment, powers and functions of the Energy Regulation Commission and the Rural Electrification Authority; and for connection purposes.	Provisions of street lights falls under this Act.
14	The Agriculture Act Cap 318	This Act seeks to promote and maintain a stable and sustainable agriculture, to provide for the conservation of the soil and its fertility and to stimulate the development of agricultural land in accordance with the accepted practices of good land management and good husbandry.	The County Government together with relevant government arms will ensure that proper agricultural practices are put in place in the project area and cut down the use of sewerage for farming. These will include adhering to the set areas of riparian zones in order to reduce soil erosion and sedimentation of water bodies.
15	Public Health Act Cap 242	The Act is primarily concerned with the protection of the	The Proponent and the contractor are legally bound by

	Constitution/Act	Brief	Relevance to the Project
		quality of water supplies and sources used for human, domestic and animal consumption. It contains provisions against environmental pollution by what it describes as "nuisance" that would result in the pollution of the environment by gaseous emissions, solid wastes and liquid effluent in order to protect public health.	this Act to prevent this from happening.
16	Lakes and Rivers Act (Cap 409)	The Lakes and Rivers Act provides for the protection of rivers, lakes and associated flora and fauna.	The provisions of this Act therefore have to be applied in the management of rivers, streams and riparian areas that will be within by the proposed project.
17	Water Act 2002	The Act seeks to make better provision for the conservation, control of pollution, apportionment and use of the water resources in Kenya, and for purposes they are incidental thereto and connected therewith.	The proposed project shall require large quantities of water during the construction phase and generation of equally large volumes of surface run-off during construction. The contractor shall seek the necessary permits to obtain water and shall abide by the conditions attached to the permit(s).
18	The Penal Code (Cap 63)	Section 191 of the Penal Code states that if any person or institution that voluntarily corrupts or foils, water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offense.	The provisions of this Act therefore have to be applied in the management waters resources that will be within by the proposed project during the construction phase. The officers of County Government with jurisdiction will exercise due diligence.
19	Climate Change (Amendment) Act 2023	The Act applies to the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.	The Act is applicable in all sectors of the economy and projects undertaken by the national and county governments.

	Constitution/Act	Brief	Relevance to the Project
20	Wildlife Conservation and Management Act Cap 376	The Act regulates wildlife conservation within the country. It undertakes to protect the fauna and flora within and outside of the National parks and reserves.	By invoking the provisions of this Act, it will ensure protection of biodiversity in the project work sites.
21	Urban and Cities (Amendment) Act 2019	The Act provides regulations on the classification, governance and management of urban areas and cities and further providing the criteria of establishing urban areas. In the First Schedule, the Act enlists the services that any municipality shall provide to its residents which include but not limited to traffic control and parking, water and sanitation, refuse collection, solid waste management, pollution abatement services among others.	Through provision of proper urban planning and provision of basic services such as roads, foot paths, water and drainage the provisions of this Act will be triggered.
22	County Government Act, 2012	Section 109 of the County Government Act (2012) helps counties to ensure effective coordination of spatial developments.	This Act will be triggered as the Project falls under the jurisdiction of the local County Government.
23	The National Construction Authority Act (NCA), 2011	The National Construction Authority Act, Number 41 of 2011 is set to streamline, overhaul and regulate the construction industry in Kenya. The Contractor who will undertake the project will be one who is registered with NCA.	The Act also outlines that every development projects must be registered and subsequent construction permit secured from the Authority prior to commencement of the project activities.
24	The Environment and Land Court Act, 2011	This is an Act of Parliament that gives effect to Article 162 (2) (b) of the Constitution to establish a superior court to hear and determine disputes relating to the environment and the use or occupation of land.	This Act may be triggered in case of any land ownership/boundaries disputes.

	Constitution/Act	Brief	Relevance to the Project
		The court has powers to deal with disputes relating to land administration and management. The court is also empowered to hear cases relating to public, private and community land and contracts or other instruments granting any enforceable interests in land.	
25	The Land Commission Act	The Act provides for the management and administration of land in accordance with the principles of Land Policy set out in Article 60 of the Constitution and the national land policy;	This Act may be triggered in case of any land ownership disputes.
26	Employment Act 2007	This Act applies to all employees employed by any employer under a contract of service. Employment of children is prohibited under this Act.	During construction, the project sites will become place of work where people are engaged as employees. Hence the provisions of this Act will be triggered.
27	The Labour Relations Act, 2007	This Act provides a legal framework to promote freedom of association and the right to collective bargaining, to streamline the registration process of trade unions and employees' organizations	During construction, the project sites will become place of work where people are engaged as employees. Hence the provisions of this Act will be triggered.

4.7 National Guidelines and Regulations

EIA is a legal requirement in Kenya rooted in the constitution. Chapter 69 of the Constitution of Kenya lists obligations in respect of the environment. The state must establish systems of environmental impact assessment, environmental audit, and environmental monitoring. The state must also eliminate processes and activities likely to endanger the environment. Consequently, the National Assembly of the Republic of Kenya has developed several laws to establish systems and guide the environmental impact assessment process in Kenya. The Environmental Management and Coordination Act (EMCA) 1999 (cap 387 of the laws of Kenya), Environmental (Impact Assessment and Audit) Regulations 2003, Environmental Management and Coordination Act (Amendment) Act 2015, and Environmental (Impact Assessment and Audit) (Amendment) Regulations 2019, are some of these laws.

Legal Notices 31 and 32 of 2019 categorizes projects into three categories, namely, low risk projects, medium risk projects, and high-risk projects. Depending on the project type, the consultant must submit one of three reports for the proponent (developer): Summary Project

Report (SPR) for low-risk projects, Comprehensive Project Report (CPR) for medium-risk projects, and Study Report (SR) for high-risk projects.

The Environment (Impact Assessment and Audit) Regulations, 2003 and 2019; Legal Notice No. 101

The Regulations supplements EMCA, 1999. In the following specific Sections, the regulation states that;

10. (1) On determination of the project report, the decision of the Authority, together with the reasons thereof, shall be communicated to the proponent within forty-five days of the submission of the Comprehensive Project Report (CPR). (2) Where the Authority is satisfied that the project will have no significant impact on the environment or that the CPR discloses sufficient mitigation measures, the Authority may issue a license in Form 3 set out in the First Schedule to these Regulations. (3) If the Authority finds that the project will have a significant impact on the environment and the CPR discloses insufficient mitigation measures, the Authority shall require that the proponent undertake an Environmental Impact Assessment study in accordance with these Regulations. (4) A proponent who is dissatisfied with the Authority's decision that an Environmental Impact Assessment study is required, may within fourteen days of the Authority's decision, appeal against the decision to the National Environmental Tribunal in accordance with regulation 46.

11. (1) An Environmental Impact Assessment study shall he conducted in accordance with terms of reference developed during the scoping exercise by the proponent and approved by the authority (NEMA). (2) The terms of reference shall include matters required to be considered in the making of an Environmental Impact Assessment as may be contained in the Second Schedule to these Regulations and such other matters as the Director General-NEMA may in writing require.

12. (1) An Environmental Impact Assessment study shall be conducted in accordance with the general Environmental Impact Assessment guidelines and sector Environmental Impact Assessment guidelines set out in the Third Schedule to these Regulations. (2) Sector environmental impact assessment guidelines shall be developed by the relevant lead agency in consultation with the Authority.

Environmental Management and Coordination (Water Quality) Regulations, 2006

This Legal Notice on Water Quality provides that anyone who discharges effluent into the natural environment shall be required to apply for Effluent Discharge License. The license for discharge is KES 5,000 while annual license fee for discharge into the environment will be KES 20,000 or 100,000 depending on the facility. Non-compliance with the regulations attracts a fine not exceeding KES 500,000 and the polluter pay principle may apply depending on the court ruling. During the construction phase, the contractor shall obtain the necessary discharge permits. The contractor will abide by the conditions of the discharge license(s), which may include quality trend monitoring and data archiving.

Wastewater guidelines

Part of the study involves a review of the environmental standards that provides a basis for monitoring and future audits. The table below presents recommended guidelines on wastewater quality for discharge into the public sewers and open water bodies.

Table 11 - Kenya Discharge Guidelines for Waste Water

Parameter	Discharge in public sewers (mg/l)	Discharge into water bodies (mg/l) – Assuming 10% dilution
PH	6.0 – 9.0	6.0 – 9.0
BOD5 (20°C)	500	20
COD	1000	50
Suspended Solids	500	30
Detergents	30	Nil
Heavy metals (combined)	1	0.1
Oils/Grease	50	Nil
Nitrates (TN)	20	10
Phosphates (TP)	30	5
Conductivity	-	1500 uS/cm
4hr PV Value	No limits	20
Faecal Coliforms	No limits	1000/100ml for large water bodies, otherwise <10/ml)
Sulphates	-	500
Dissolved Oxygen	No limits	2
Phenols	-	2
Cyanides	-	0.1
Chlorides	-	1000
PCB	-	0.003
Colour	No limits	5 Hazen Units
Odour	No limits	Not objectionable

Sources: NEMA

Environmental Management and Co-Ordination (Waste Management) Regulations, 2006
These regulations define the responsibilities of waste generators and define the duties and requirements for transportation and disposal of waste. The regulations provide for mitigation of pollution and handling of hazardous and toxic wastes. The regulations require a waste generator to dispose waste only to a designated waste receptacle. The proponent shall adhere to the regulations and proposes to contract a NEMA registered waste transporter (NEMA, 2006).

Environmental Management and Coordination (Noise and Excessive Vibrations Pollution) (Control) Regulations, 2009
This regulation prohibits any person to cause unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. Part 11 section 6 (1) provides that no person shall cause noise from any source which exceeds any sound level as set out in the First Schedule of the regulations. The contractor will prepare a Noise Control Plan (NCP) to reduce the possibility of adverse noise impacts to human health in the project area.

Environmental Management and Co-ordination (Air Quality) Regulations, 2014
This regulation is referred to as -The Environmental Management and Coordination (Air Quality) Regulations, 2014‖. The objective of these Regulations is to provide for prevention, control and

abatement of air pollution to ensure clean and healthy ambient air. The general prohibitions state that no person shall cause the emission of air pollutants listed under First Schedule (Priority air pollutants) to exceed the ambient air quality levels as required/ stipulated under the provisions of the Seventh Schedule (emission limits for controlled and non-controlled facilities) and Second Schedule (ambient air quality tolerance limits). The regulations provides for the establishment of emission standards for various sources, including as mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, 1999. It also covers any other air pollution source as may be determined by the Minister in consultation with the Authority. The Regulations prohibits the Proponent from:

- Acting in a way that directly or indirectly cause or may cause air pollution to exceed levels set out in the second Schedule to the Regulations
- Allowing particulates emissions into the atmosphere from any source not listed in the sixth schedule of the Regulations
- Causing ambient air quality in controlled areas (listed in Schedule Thirteen) to exceed those stipulated under second Schedule.
- Allowing (during construction and demolition) emission of particulate matter above the limits stipulated in Second Schedule.
- Causing or allowing stockpiling or storage of material in a manner likely to cause air pollution.
- Causing or allowing emissions of oxides of nitrogen in excess of those stipulated in the eleventh Schedule of the Regulation.

The Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007; Legal Notice No. 73

The Controlled Substances Regulations defines controlled substances and provides guidance on how to handle them. The regulations stipulate that controlled substances must be clearly labelled with among other words, “Controlled Substance-Not ozone friendly” to indicate that the substance or product is harmful to the ozone layer. Advertisement of such substances must carry the words, “Warning: Contains chemical materials or substances that deplete or have the potential to deplete the ozone layer”. Persons handling controlled substances are required to apply for a permit from NEMA.

Products containing controlled substances include air conditioners, air coolers, refrigerants, portable fire extinguishers, heat pump equipment, dehumidifiers, insulation boards, panels and pipe covers, pre-polymers, etc. The proponent is thus required to comply with these regulations during the project implementation phase.

Table 12 - Relevance of National Guidelines and Regulations on the Project

	Guideline/Regulation	Brief	Relevance to the Project
1	Legal Notices 31 and 32 of 2019	These Notices 31 and 32 categorize projects into three categories, namely, low risk projects, medium risk projects, and high-risk projects. Depending on the project type, the consultant must submit one of three reports for the	Carrying out of EIA studies falls under the requirements of these Legal Notices.

	Guideline/Regulation	Brief	Relevance to the Project
		proponent (developer): Summary Project Report (SPR) for low-risk projects, Comprehensive Project Report (CPR) for medium-risk projects, and Study Report (SR) for high-risk projects.	
2	The Environment (Impact Assessment and Audit) Regulations, 2003 and 2019; Legal Notice No. 101	These Regulations spell out how to handle the various types reports for each category of project type. An Environmental Impact Assessment (EIA) study shall be conducted in accordance with the general Environmental Impact Assessment guidelines and sector Environmental Impact Assessment guidelines set out in the Third Schedule to these Regulations	Carrying out of EIA studies falls under the requirements of these Legal Notice and Regulations.
3	Environmental Management and Coordination (Water Quality) Regulations, 2006	This Legal Notice on Water Quality provides that anyone who discharges effluent into the natural environment shall be required to apply for Effluent Discharge License.	During the construction phase, the contractor shall obtain the necessary discharge permits. The contractor will abide by the conditions of the discharge license(s), which may include quality trend monitoring and data archiving.
4	Wastewater guidelines	The Guidelines provide guidelines on wastewater quality for discharge into the public sewers and open water bodies.	As water will be used during the Construction Phase thereby generating waste waters, provisions of these guidelines will be triggered.
5	Environmental Management and Co-Ordination (Waste Management) Regulations, 2006	These regulations define the responsibilities of waste generators and define the duties and requirements for transportation and disposal of waste. The regulations provide for mitigation of pollution and handling of hazardous and toxic wastes. The regulations require a waste generator to dispose waste only to a designated waste receptacle.	The proponent shall adhere to the regulations and proposes to contract a NEMA registered waste transporter (NEMA, 2006).

	Guideline/Regulation	Brief	Relevance to the Project
6	Environmental Management and Coordination (Noise and Excessive Vibrations Pollution) (Control) Regulations, 2009	This regulation prohibits causing of unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. Part 11 section 6 (1) provides that no person shall cause noise from any source which exceeds any sound level as set out in the First Schedule of the regulations.	The contractor will prepare a Noise Control Plan (NCP) to reduce the possibility of adverse noise impacts to human health in the project area.
7	Environmental Management and Co-ordination (Air Quality) Regulations, 2014	The objective of these Regulations is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. No person shall cause the emission of air pollutants listed under First Schedule (Priority air pollutants) to exceed the ambient air quality levels as required/ stipulated under the provisions of the Seventh Schedule (emission limits for controlled and non-controlled facilities) and Second Schedule (ambient air quality tolerance limits).	During Construction Phase air quality may be impacted through dust generated during construction and also vehicle exhaust emissions.
8	The Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007; Legal Notice No. 73	The Regulations defines controlled substances and provides guidance on how to handle them.	The proponent is thus required to comply with these regulations during the project implementation phase.

4.8 Multilateral Environmental Agreements

A number of international agreements and conventions have effects on the use and regulations of ecosystems and the environment. In general, Kenyan law and legal regulations within the environmental sector reflects the ratification of these agreements and conventions. These include the following:

Safety Provision (Building) Convention 1937

This Convention applies to all construction activities, namely building, civil engineering, and erection and dismantling work, including any process, operation or transport on a construction site, from the preparation of the site to the completion of the project. The Convention describes the term "construction" as:
1. Building, including excavation and the construction, structural alteration, renovation, repair, maintenance (including cleaning and painting) and demolition of all types of buildings or structures;
2. Civil engineering, including excavation and the construction, structural alteration, repair, maintenance and demolition of, for example, airports, docks, harbours, inland waterways, dams, river and avalanche and sea defence works, roads and highways, railways, bridges, tunnels, viaducts and works related to the provision of services such as communications, drainage, sewerage, water and energy supplies;
3. The erection and dismantling of prefabricated buildings and structures, as well as the manufacturing of prefabricated elements on the construction site.

Article 6 states that: Measures shall be taken to ensure that there is co-operation between employers and workers, in accordance with arrangements to be defined by national laws or regulations, in order to promote safety and health at construction sites while Article 12, Section 1, States that the National laws or regulations shall provide that a worker with the right to remove himself from danger when he has good reason to believe that there is an imminent and serious danger to his safety or health, and the duty so to inform his supervisor immediately.

African Convention of the Conservation of Nature and Natural Resources
This was the effort of the African Ministerial Conference on the Environment (AMCEN) which gave birth to the convention among the African states. Other than conservation of other resources, the convention requires that contracting parties designate conservation areas within their waters and provide a zonation plan in order to conserve the protected areas.

Convention on Biological Diversity (CBD)
The Convention on Biological Diversity adopts a broad approach to conservation. It requires Parties to the Convention to adopt national strategies, plans and programmes for the conservation of biological diversity, and to integrate the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies. The proposed project is expected to conserve biodiversity, especially the rare and endangered species in the project area and its environs.

United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC)
The United Nations Framework Convention on Climate Change (UNFCC) seeks to regulate levels of greenhouse gases (GHGs) concentration in the atmosphere, so as to avoid the occurrence of climate change at levels that would harm economic development, or that would impede food production activities. The Convention is founded on the principle that contracting parties should take courses of action, in respect of their economic and social activities, and with regard to the Convention's specific requirements, that will protect the climate system for present and future generations. The UNFCC informs land use in so far as activities on land are required to be designed to have a minimum negative effect on factors that may result in climate change.

The Kyoto Protocol requires signatories to reduce their greenhouse gas emissions levels to 5% below 1990 levels by the year 2012. The Protocol came into force on 16th February 2005, after it

received the pre-requisite signatures. However, with the United States, Australia, China and India not being signatories, the future of the protocol looked uncertain though this has been renegotiated for another 7 years at Cancun Mexico in 2010 during UNFCCC's Conference of the Parties (COP 16). NEMA is the national focal point for this Protocol.

Some of the principal concepts of the Kyoto Protocol

1) The main feature of the Protocol is that it establishes legally binding commitments to reduce emissions of greenhouse gases. The commitments are based on the Berlin Mandate, which is a part of UNFCCC negotiations leading up to the Protocol.
2) Implementation: In order to meet the objectives of the Protocol, Annex I Parties are required to prepare policies and measures for the reduction of greenhouse gases in their respective countries. In addition, they are required to increase the absorption of these gases and utilize all mechanisms available, such as joint implementation of the Clean Development Mechanism and emissions trading, in order to be rewarded with credits that would allow more greenhouse gas emissions at home.
3) Minimizing impacts on developing countries by establishing an Adaptation Fund for Climate Change.
4) Accounting, reporting and reviewing in order to ensure the integrity of the Protocol.
5) Compliance: Establishing a Compliance Committee to enforce compliance with the commitments under the Protocol.

Paris Agreement on Climate Change

The Paris Agreement establishes the main framework for cooperative action on climate change beyond 2020 and will replace the Kyoto Protocol.

The Key Elements of Paris Agreement on Climate Change

1. To keep global increase in temperatures "well below" 2ºC above pre-industrial times and "endeavour to limit" them even more, to 1.5ºC.
2. To limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100.
3. To review each country's contribution to cutting emissions every five years so they scale up to the challenge.
4. And for rich countries to help poorer nations by providing "climate finance" to adapt to climate change and switch to renewable energy.

United Nations Convention to Combat Desertification (UNCCD)

This Convention was adopted on 17th June 1994 in Paris and came into force on 26th December 1996. The objective of the United Nations Convention to Combat Desertification (UNCCD) is to combat desertification and to mitigate the effects of drought in seriously affected countries, especially those in Africa. It seeks to achieve this objective through integrated approaches to development, supported by international cooperation and partnership arrangements, in the affected areas. It lays emphasis on long-term strategies that focus on improved productivity of land and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, in particular at the community level. The provisions are domesticated in several Acts of Parliament. Section 46 of EMCA requires District Environment Committees to identify areas that require re-forestation or afforestation as well as to mobilize local communities to carry out these activities. The proposed project will need to adhere to the requirements of the UNCCD.

Convention for the Protection of the World Cultural and Natural Heritage

This Convention was adopted in Paris on the 21st November 1972. The Convention currently has at least 178 signatories. Its primary purpose is to preserve cultural and natural heritage, which includes monuments, architectural works, cave dwellings, painting and natural formations that are universally outstanding. Kenya ratified the Convention on 5th June 1991. The National Museums of Kenya is the national focal point. Findings of any significance need to be notified to the National Museums of Kenya.

Basel Convention - Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal

The Convention was adopted on 22nd March 1989 and came into force on 5th May 1992. The Convention seeks to put in place measures that reduce the production of hazardous wastes and further to minimize their unlawful transboundary disposal. Kenya acceded to the Basel Convention on 1st June 2000. Section 91 of EMCA empowers the Standards and Enforcement Review Committee to classify hazardous wastes, whereupon NEMA is required to establish guidelines on the management of the waste. Section 141 of the Act makes it an offence to import, dispose or otherwise manage hazardous wastes contrary to the Act.

Bamako Convention on Hazardous Wastes within Africa

The Bamako Convention was adopted in Mali, Bamako on 30th January 1991; it came into force on 22nd April 1998. The Convention has 18 parties (ten ratifications and eight accessions). Kenya signed the Convention on 25th March 2004. The Convention has provisions for import, transboundary movement and management of hazardous wastes within Africa. It is intended to fortify the provisions of the Basel Convention in order to protect the African people and their environment against dumping of hazardous wastes. This regional Convention also influences the use of land in Kenya in a similar manner as the application of the Basel Convention.

New Partnership for Africa's Development (NEPAD)

The New Partnership for Africa's Development (NEPAD) adopted by the African Heads of State and Government is an initiative based on a common vision, firm and shared conviction to eradicate poverty and place the continent on the path to sustainable growth and development as well as participate in global economic and political arena. NEPAD recognizes that the range of issues necessary to nurture the region's environmental base and sustainable use of natural resources is vast and complex; and that a systematic combination of initiatives is necessary for the development of a coherent environmental programme. The NEPAD strategic framework to promote Africa's sustainable development has been developed prepared through a consultative and participatory process under the leadership of the African Ministerial Conference on Environment (AMCEN). The plan is comprehensive, holistic and integrates sustainable development principles.

East African Community (EAC)

The East Africa Community (EAC) is a regional intergovernmental organization of the republics of Kenya, Uganda and Tanzania, with its headquarters in Arusha, Tanzania. The EAC aims at achieving various goals and objectives within its mandate through "Promotion of sustainable growth and equitable development of the region including rational utilization of the region's natural resources and protection of the environment." The Community has developed a draft Protocol on Environment and Natural Resources, which commits member states to sound environment and natural resources management. In addition, joint guidelines on Environmental Impact Assessment for Shared Ecosystems, have been adopted by the member states as an annexure

to the protocol on environment and natural resources. Other specific areas of co-operation are in environment and natural resources management arrangement. The EAC Treaty will provide an effective mechanism for the general advancement of the region.

Table 13 - Relevance of Multilateral Environmental Agreements on the Project

	Agreement	Brief	Relevance to the Project
1	Safety Provision (Building) Convention 1937	This Convention applies to all construction activities, namely building, civil engineering, and erection and dismantling work, including any process, operation or transport on a construction site, from the preparation of the site to the completion of the project. Other than conservation of other resources, the convention requires that contracting parties designate conservation areas within their waters and provide a zonation plan in order to conserve the protected areas.	The Convention will be triggered during the Construction Phase of the Project.
2	African Convention of the Conservation of Nature and Natural Resources	Other than conservation of other resources, the convention requires that contracting parties designate conservation areas within their waters and provide a zonation plan in order to conserve the protected areas.	The Convention will be triggered during the Construction Phase of the Project.
3	Convention on Biological Diversity (CBD)	It requires Parties to the Convention to adopt national strategies, plans and programmes for the conservation of biological diversity, and to integrate the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies.	The proposed project is expected to conserve biodiversity, especially the rare and endangered species in the project area and its environs.
4	United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to the	The Framework seeks to regulate levels of greenhouse gases (GHGs) concentration in the atmosphere, so as to avoid the occurrence of climate change at levels that	During Construction Phase air quality may be impacted by vehicle exhaust emissions much of which are greenhouse gases.

	Agreement	Brief	Relevance to the Project
	United Nations Framework Convention on Climate Change (UNFCCC)	would harm economic development, or that would impede food production activities.	
5	Paris Agreement on Climate Change	The Paris Agreement establishes the main framework for cooperative action on climate change beyond 2020 and will replace the Kyoto Protocol. Among others, it aims to limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100.	During Construction Phase air quality may be impacted by vehicle exhaust emissions much of which are greenhouse gases.
6	United Nations Convention to Combat Desertification (UNCCD)	The objective of the Convention is to combat desertification and to mitigate the effects of drought in seriously affected countries, especially those in Africa. It lays emphasis on long-term strategies that focus on improved productivity of land and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, in particular at the community level.	The proposed project will need to adhere to the requirements of the UNCCD.
7	Convention for the Protection of the World Cultural and Natural Heritage	Its primary purpose is to preserve cultural and natural heritage, which includes monuments, architectural works, cave dwellings, painting and natural formations that are universally outstanding. The National Museums of Kenya is the national focal point.	Findings of any significance need to be notified to the National Museums of Kenya.

	Agreement	Brief	Relevance to the Project
8	Basel Convention - Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal	The Convention seeks to put in place measures that reduce the production of hazardous wastes and further to minimize their unlawful transboundary disposal. Section 91 of EMCA empowers the Standards and Enforcement Review Committee to classify hazardous wastes, whereupon NEMA is required to establish guidelines on the management of the waste. Section 141 of the Act makes it an offence to import, dispose or otherwise manage hazardous wastes contrary to the Act.	Yes provisions of this Convention will be triggered by the project.
9	Bamako Convention on Hazardous Wastes within Africa	The Convention has provisions for import, transboundary movement and management of hazardous wastes within Africa.	Yes, provisions of this Convention will be triggered by the project.
10	New Partnership for Africa's Development (NEPAD)	NEPAD recognizes that the range of issues necessary to nurture the region's environmental base and sustainable use of natural resources is vast and complex; and that a systematic combination of initiatives is necessary for the development of a coherent environmental programme.	As the projects aims at sustainable developments of the settlement, it will trigger provisions of NEPAD.
11	East African Community (EAC)	The EAC aims at achieving various goals and objectives within its mandate through "Promotion of sustainable growth and equitable development of the region including rational utilization of the region's natural resources and protection of the environment." In addition, joint guidelines on Environmental Impact	As the projects aims at sustainable developments of the settlement, it will trigger provisions of EAC.

	Agreement	Brief	Relevance to the Project
		Assessment for Shared Ecosystems, have been adopted by the member states as an annexure to the protocol on environment and natural resources.	

4.9 World Bank Safeguard Policies

Under World Bank environmental safeguard policies projects need to be environmentally and economically sustainable and need to be screened against potential impacts. Although the project is expected to produce net benefits, certain project activities may have environmental or social impacts that require mitigation. Based on the screening process, overall project falls under Category B of the World Bank. Category B projects have impacts that are "less significant, not as sensitive, numerous, major or diverse. Few, if any, impacts are irreversible, and remedial measures can be more easily designed."

Table 14 - The World Bank Safeguard Policies

Policy	Applicability to this project
Environmental Assessment (OP 4.01)	Yes
Natural Habitats (OP 4.04)	No
Pest Management (OP 4.09)	No
Indigenous People (OP 4.10)	No
Physical Cultural Resources (OP 4.11)	Yes
Involuntary Resettlement (OP 4.12)	Yes
Forests (OP 4.36)	No
Dam Safety (OP 4.37)	No
Projects in International Waterways (OP 7.50)	No
Projects in Disputed Areas (OP 7.60)	No

Environmental Assessment (OP 4.01)

The ESIA identifies the major potential environmental impacts and proposes measures to mitigate these effects. Many of the impacts will only be localised around the project.

Natural Habitats (OP 4.04)

There are a number of critical habitats in the basin; however, none will be adversely affected by the project. The project will not be implemented in any protected area, but impact on a few critical natural habitats including wetlands may lead to degradation or conversion of habitats.

Physical Cultural Property (OP 11.03)

The project will not include areas of significant cultural value. The Government of Kenya through the Department of Monuments and Sites of the National Museums of Kenya is committed to the preservation of cultural properties and seeks means to avoid their elimination.

Indigenous Peoples (OP 4.20)

The project will not impact any indigenous peoples in the Project area.

Involuntary Resettlement (OP/BP 4.12)

The project will result in very small scale land acquisition and no foreseeable large resettlement programme which will necessitate a preparation of ARAP. In general, involuntary resettlement may cause severe long-term hardship, impoverishment, and environmental damage unless appropriate measures are carefully planned and carried out. However, this project's impacts are not expected to be major but less significant, not as sensitive, and few, if any, impacts are irreversible, and remedial measures can be more easily designed. The project has been categorized as a World Bank Category B project.

It is therefore important that the project will ensure activities are conceived and executed as sustainable development programmes, providing sufficient investment resources to enable the persons in the project to share in project benefits. Persons should be meaningfully consulted and should have opportunities to participate in planning and implementing of the project. Any displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

(The World Bank environmental and social due diligence confirmed the project classification as **environmental Category B.** The Bank's environmental safeguard policies triggered by the project include Environmental Assessment (Operational Policy 4.01; OP 4.01) and Physical Cultural Resources (OP 4.11). The World Bank's social safeguards policies triggered by the project include: Indigenous Peoples (OP 4.10) and Involuntary Resettlement (OP 4.12).

Table 15 - Relevance of Applicable WB Environmental and Social Policy Framework on the Project

	Policy	Policy Brief	Policy relevance to the Project
1	Environmental Assessment (OP 4.01)	Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental associated with Bank lending operations. The purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable and that potentially affected people have been properly consulted. By nature of the proposed project, interactions with general environmental and social setting are anticipated. In this regard, this safeguard is triggered.	The ESIA identifies the major potential environmental impacts and proposes measures to mitigate these effects.

	Policy	Policy Brief	Policy relevance to the Project
2	Natural Habitats (OP 4.04)	The policy is designed to promote environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The policy seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society.	There are a number of critical habitats in the basin; however, none will be adversely affected by the project. The project will not be implemented in any protected area, but impact on a few critical natural habitats including wetlands may lead to degradation or conversion of habitats
4	Indigenous People (OP 4.10)	This policy contributes to the Bank's mission of poverty and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of indigenous peoples. For all projects that are proposed for Bank financing and affect indigenous peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consultation.	The project will not impact any indigenous peoples in the Project area.
5	Physical Cultural Resources (OP 4.11)	This policy is meant to assist in preserving physical cultural resources including the movable or immovable (above or below ground, or under water) objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance including sites and unique natural values.	The project will not include areas of significant cultural value. The Government of Kenya through the Department of Monuments and Sites of the National Museums of Kenya is committed to the preservation of cultural properties and seeks means to avoid their elimination.

	Policy	Policy Brief	Policy relevance to the Project
6	Involuntary Resettlement (OP 4.12)	The policy states that "Where large-scale of population displacement is unavoidable, a detailed resettlement plan, timetable, and budget are required. Resettlement plans should be built around a development strategy and package aimed at improving or at least restoring the economic base for those relocated. 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 project will result in very small-scale land acquisition and no foreseeable large resettlement programme which will necessitate a preparation of ARAP.
	Forests (OP 4.36)	The policy on forest safeguards seeks to realize the potential of forests to reduce poverty in sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environmental services and values of forests.	The project will not impact any forest in the Project area as the project is located in an urban setting.

4.10 Administrative Framework for ESIA

The National Environment Council (NEC)

EMCA 1999 No. 8 part III, section 4 outlines the establishment of the National Environment Council (NEC). NEC is responsible for policy formulation and directions for the purposes of EMCA; set national goals and objectives and determines policies and priorities for the protection of the environment and promote co-operation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programs.

The National Environmental Tribunal (NET)

The National Environment Tribunal (NET) is established under section 125 and Part XII of the Environmental Management and Coordination Act (EMCA) No. 8 of 1999. Its principal function is to receive, hear and determine appeals arising from decisions of the National Environment Management Authority (NEMA) on issuance, denial or revocation of Environmental Impact Assessment (EIA) licenses, among other decisions. Such licenses are, in effect, statutory permission to undertake developments of specified nature. The function arises from EMCA's enumeration (in the Third Schedule) of certain kinds of developments that require EIA and thereafter, NEMA's issuance of EIA license, without which the specified developments cannot proceed.

The National Environment Management Authority (NEMA)

The objective and purpose for which NEMA is established is to exercise general supervision and coordinate over all matters relating to environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. NEMA's mandate is designated to the County Environment Committees.

***National Environmental Complaints Committee* (NECC)**

The Committee performs the following functions:

- Investigate any allegations or complaints against any person or against the Authority in relation to any environmental condition in Kenya and on its own volition, any suspected case of environmental degradation and to report findings together with its recommendations thereon to the Council.
- Prepare and submit to the Council periodic reports of its activities which shall form part of the annual report on the state of the environment under section 9 (3)
- To perform such other functions and exercise such powers as may be assigned to it by the Council.

The County Environment Committees (CECS)

According to EMCA, 1999 No. 8, section 40, the following sub-sections states that:

1) Every County Environment Committee shall, within one year of the commencement of this Act and every five years thereafter, prepare a county environment action plan in respect of the county for consideration and adoption by the County Assembly.
2) Every County Environment Committee, in preparing a county environment plan, shall undertake public participation and take into consideration every other County Environment Action Plan already adopted with a view to achieving consistency among such plans.
3) The respective County Executive Committee members of every county shall submit the County Environment Action Plan referred to in subsection (1) to the Cabinet Secretary for incorporation into the national environment action plan referred to in section 37.
4) The Authority shall consider every county environment action plan and either recommend incorporation of such plan into the national environment action plan or specify changes to be incorporated into a respective county environmental plan.

5) The Cabinet Secretary shall, on the recommendation of the Authority, issue guidelines and prescribe measures for the preparation of environmental action plans.

Table 16 - The Regulatory Agencies Relevant to the Project

S. No.	Institution role in the proposed project	Role in the proposed project	Project phase required
1.	National Environment Management Authority	Issuance of EIA license and Monitoring for Compliance with conditions and environmental law	Construction, operation and decommissioning
2.	Kiambu County Government	Approval of plans and building inspections, issuance of licenses	Planning and preconstruction
3.	Physical Planning Department – Kiambu County	Building certifications	Planning, preconstruction and construction
4.	Directorate of Occupational Safety and Health Services	Ensure safety of workers at construction site	Construction and operation
5.	National Construction Authority	Project Registration and Certification	Planning and preconstruction
6.	Local Water and Sewerage Company	Permit to connect to the sewer line in the project area	Planning and preconstruction

4.11 NEMA Compliance

The government established the National Environmental Management Authority (NEMA) as the supreme regulatory and advisory bodies on environmental management in Kenya under EMCA 1999. NEMA is charged with the responsibility of coordinating and supervising the various environmental management activities being undertaken by other statutory organs. NEMA also ensures that environmental management is integrated into development policies, programmes, plans and projects.

4.12 Sectoral Integration

This integration encourages provision of sustainable development and a healthy environment to all Kenyans. The key functions of NEMA through the NEC include policy direction, setting national goals and objectives and determining policies and priorities for the protection of the environment, promotion of cooperation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes and performing such other functions as contained in the act. Other stakeholder authorities include Ministry of Roads and Transport, Ministry of Water, Sanitation and Irrigation, Ministry of Gender, Culture, the Arts & Heritage, Ministry of Environment, Climate Change and

Forestry, Ministry of Health, Ministry of Interior and National Administration, and County Governments where each settlement is located.

4.13 KISIP 2 Institutional Framework

Institutional Arrangements Implementation of KISIP will involve a three-tier institutional arrangement (National, County and Community). Both the National and County PCT will have dedicated Safeguards Teams to address safeguard issues. The community through the Settlement Executive Committees (SECs) will be enabled to participate in the preparation of mitigation plans, implementation and monitoring as well as grievance redress.

KISIP 2 is being implemented at both National and County Levels. National Level: Responsible for overall implementation of the project. The following implementation units have been established; -Project Steering Committee -National Project Coordination Team (NPCT) County Level: Responsible for the day-to-day coordination of county level Project activities through the County Project Coordination Team (CPCT). CPCTs have been established in all the 33 participating counties. The Council of Governors – Linking the two levels of Government Settlement Level: Settlement Executive Committees (SEC) and Grievance Redress Committee (GRC).

a) National Level: The following implementation units have been put in place
i). Project Steering Committee: Responsible for Strategic guidance and in consultation with World Bank, provides approval of Annual Work Plans and Budgets.

ii). National Project Coordination Team: Responsible for the overall coordination of Project activities. NPCT is in charge of Project design, financial management, procurement, M&E, reporting, capacity building and communication. Further, it supports the participating counties to ensure adherence to IDA's applicable policies and guidelines.

The national level works in liaison with the Council of Governors (CoG) to ensure effective coordination and communication with the participating County Governments.

a) **County Level**
County Project Coordination Team: Responsible for implementing Project activities within respective counties and supervising the day-to-day project activities.

c) Community level
i). Settlement Executive Committee (SEC): Established in each participating settlement. Responsible for community mobilization, awareness creation and ensuring community participation on Project activities.

ii). Grievance Redress Committee (GRC): Established in each of the participating settlements. Responsible for receiving and registering grievances/ complaints, investigating and giving resolutions. Cases that are not resolved are escalated to CPCT, then to NPCT and WBGRM. Complainants are also at liberty to seek redress at the court of law.

Table 17 - Implementation Roles of NPCT and CPCT

Roles at the National Level (NPCT)	Roles at the County Level (CPCT)
• Contract Management and Administration • Collaborate with National Government Ministries/ Departments/ Agencies in tenure processes and approval of the outputs • Dispute resolution (where applicable)	• Delineation of settlements • Facilitate entry to the settlement • Community mobilization and sensitization • Participate in all activities- planning and surveying • Plan approval and Validation of List of Beneficiary • Implementation of SMP/RAP (where applicable) • Dispute resolution
National Level (NPCT)	**County Level (CPCT)**
• Preparation of detailed engineering designs, bidding documents and supervision of works	• Infrastructure works procurement and implementation

CHAPTER 5: ENVIRONMENTAL AND SOCIAL ECONOMIC BASELINE INFORMATION

5.1 Environmental Baseline Information for Kiambu Couty

5.1.1 Physical and Topographic Features

Kiambu County is divided into four broad topographical zones; Upper Highland, Lower Highland, Upper Midland and Lower Midland Zone. The Upper Highland Zone is found in Lari constituency and it is an extension of the Aberdare ranges that lies at an altitude of 1,800-2,550 metres above sea level. It is dominated by highly dissected ranges and it is very wet, steep and important as a water catchment area. The lower highland zone is mostly found in Limuru and some parts of Gatundu North, Gatundu South, Githunguri and Kabete constituencies. The area is characterized by hills, plateaus, and high-elevation plains. The area lies between 1,500-1,800 metres above sea level and is generally a tea and dairy zone though some activities like maize, horticultural crops and sheep farming are also practiced.

The upper midland zone lies between 1,300-1,500 metres above sea level and it covers mostly parts of Juja and other constituencies with the exception of Lari. The landscape comprises of volcanic middle level uplands. The lower midland zone partly covers Thika Town (Gatuanyaga), Limuru and Kikuyu constituencies. The area lies between 1,200-1,360 metres above sea level.

The soils in the midland zone are dissected and are easily eroded. Other physical features include steep slopes and valleys, which are unsuitable for cultivation. Some parts are also covered by forests.

The county is covered by three broad categories of soils which are: high level upland soils, plateau soils and volcanic footbridges soils. These soils are of varying fertility levels with soils from high-level uplands, which are from volcanic rocks, being very fertile. Their fertility is conducive for livestock keeping and growth of various cash crops and food crops such as tea, coffee, horticultural products, pyrethrum, vegetables, maize, beans, peas and potatoes. These soils are found in the highlands, mostly in Gatundu South, Gatundu North, Githunguri, Kiambu, Kiambaa, Lari, Kikuyu, Kabete and Limuru Constituencies. Low fertility soils are mainly found in the middle zone and the eastern part of the county which form part of the semi-arid areas. The soils are sandy or clay and can support drought resistant crops such as soya beans and sunflowers well as ranching. These soils are mostly found in parts of Juja, Thika Town, Ruiru, Kabete, Limuru, Gatundu North and Gatundu South Constituencies.

Most parts of the county are covered by soils from volcanic footbridges. These are well drained with moderate fertility. They are red to dark brown friable clays, which are suited for cash crops like coffee, tea and pyrethrum. However, parts of Thika Town, Ruiru, Juja and Lari constituencies are covered by shallow soils, which are poorly drained, and these areas are characterized by low rainfall, which severely limits agricultural development. However, these areas are suitable for ranching and growth of drought resistant crops.

5.1.2. Ecological conditions

Water in the county is from two principal sources-surface and sub-surface. The county is divided into several sub-catchments areas. The first one is Nairobi River Sub-catchment which occupies the southern part of the county with the major rivers being Nairobi, Gitaru, Gitathuru, Karura, Rui Rwaka, and Gatharaini. The second one is Kamiti and Ruiru Rivers Sub-catchment which is

located to the north of the Nairobi river sub-catchment. It has eight permanent rivers which include Riara, Kiuu, Kamiti, Makuyu, Ruiru, Bathi, Gatamaiyu and Komothai.

The third one is the Aberdare plateau that contributes to the availability of two sub-catchments areas comprising of Thiririka and Ndarugu Rivers. The main streams found in the two areas include Mugutha, Theta, Thiririka, Ruabora, Ndarugu and Komu. They flow from Nairobi, Kamiti, Ruiru, Thiririka, and Ndarugu sub-catchments to form Athi River sub-catchment. The fourth is the Chania River and its tributaries comprising of Thika and Karimenu Rivers which rise from the slopes of Mt. Kinangop in the Aberdares range.

5.1.3 Climatic conditions

The county experiences bi-modal type of rainfall. The long rains fall between mid-March to May followed by a cold season usually with drizzles and frost during June to August and the short rains between mid-October to November. The annual rainfall varies with altitude, with higher areas receiving as high as 2,000 mm and lower areas of Thika Town constituency receiving as low as 600 mm. The average rainfall received by the county is 1,200 mm. The mean temperature in the county is 26°C with temperatures ranging from 7°C in the upper highlands areas of Limuru and some parts of Gatundu North, Gatundu South, Githunguri and Kabete constituencies, to 34°C in the lower midland zone found partly in Thika Town constituency (Gatuanyaga), Kikuyu, Limuru and Kabete constituencies (Ndeiya and Karai). July and August are the months during which the lowest temperatures are experienced, whereas January to March is the hottest months. The county's average relative humidity ranges from 54 percent in the dry months and 300 percent in the wet months of March up to August.

5.2 Social Economic Baseline Information for Kiambu County

The County is subdivided into twelve sub-counties (See Fig. 2) and sixty wards. Kiambu County has twelve constituencies and sixty wards.

Figure 5 - The Sub-Counties of Kiambu

5.2.1 Demographic Features

According to the 2019 Kenya Population and Housing Census, Kiambu County population stood at 2,417,735 which is projected to be 2,854,954 by 2027.

Population projection for Urban centres

The 2019 Population and Housing Census indicate that the county had an urban population of 1,706,003 in 2019 and in 2027 is projected to be 1,995,359. The county urban population distribution per urban centres shows that Ruiru and Kikuyu towns have the highest number of people living in urban areas, followed by Thika and Karuri towns respectively. This high population in urban centres can be attributed to the proximity of the county to Nairobi as most of the people work in Nairobi and reside in the county. In addition, industrial development in some districts like Thika West and Ruiru attract more labour force. In these areas, urban planning should be effectively undertaken to avoid strain on the physical amenities from growth of informal settlements. In addition, community policing should be enhanced to reduce insecurity. Also, more infrastructural facilities like transport network, housing, schools and health centres should be built. The population distribution by urban centres is shown below.

Table 18 - Population Projection for Urban Centres in Kiambu County

Town	2019 Census		2022 Projection	2027 Projection
Gatundu	7,947		8,549	9,302
Githunguri	10,615		11,422	12,420
Juja	156,032		167,967	182,447
Limuru	81,316		87,537	95,080
Kiambu	147,853		159,099	172,983
Karuri	194,330		209,154	227,291
Thika	251,389		270,586	293,996
Ruiru	490,088		527,478	573,206
Kikuyu	323,863		348,548	378,827
Kawaida	14,038		15,109	16,419
Ting'ang'a	6,059		6,518	7,092
Githiga	5,565		5,991	6,507
Rironi	5,544		5,965	6,487
Kimende	4,356		4,687	5,097
Ikinu	2,532		2,724	2,963
Ngewa	2,452		2,639	2,868
Kijabe	2,024		2,176	2,372
Total	1,706,003		1,836,147	1,995,359

Population density and distribution

Kiambu County had a population of 952 persons per square kilometre, according to the 2019 census. This is projected to be 1125 persons/km2 by the end of 2027. Kabete sub-county has the highest population density of 3,290 persons/km2 which is projected to reach 3884 people per square kilometre in 2027. The least densely populated sub county is Lari with 313 persons/Km2 in 2019.

5.2.2 Land ownership categories/classification

There are three categories of land; public land is approximately 5%, community land 0.01%, whereas private land is approximately 94.99%.

5.2.3 Land Use

The size of land in the County is 1,878.4 km^2 for arable land and 649.7 km^2 non-arable land whereas 15.5 km^2 is under water mass. Land in Kiambu is put under diverse uses these include industrial, agricultural, commercial, wetland forest and public land where we have public utilities and amenities.

The main food crops grown in the county include maize, beans, Irish potatoes, bananas and vegetables. Although maize is the staple food, the county does not produce sufficient maize and beans to feed the population resulting to importation of cereals and grains from other counties. Banana value chain has developed with about 10 farmer groups engaged in basic banana processing into different banana products. Coffee and tea are the main industrial crops grown especially in the upper and lower highlands of the county. There are 21 coffee and 3 pyrethrum co-operative societies which assist in marketing of coffee and pyrethrum. The county has a total arable land of 1,878.4 km^2 of which a total of 21,447 ha is under food crops and a total of

35,367.41 ha is under industrial crops. Horticultural crop production plays an important role in the economy of Kiambu County. Major vegetables include French beans, snow peas, kales, cabbage, garden peas, tomatoes, spinach and carrot among others. Herbs and spices grown include dhania, basil, mint, rosemary, parsley and asparagus and are marketed within the country while others are for export market. Pineapples are mainly grown in Gatundu North Sub County, while mangoes are mainly in Thika Sub County. Avocado is grown across the county. In the past floriculture was practiced in Lari and Limuru but farmers from other sub counties including Thika, Juja and Ruiru are now growing summer flowers for export.

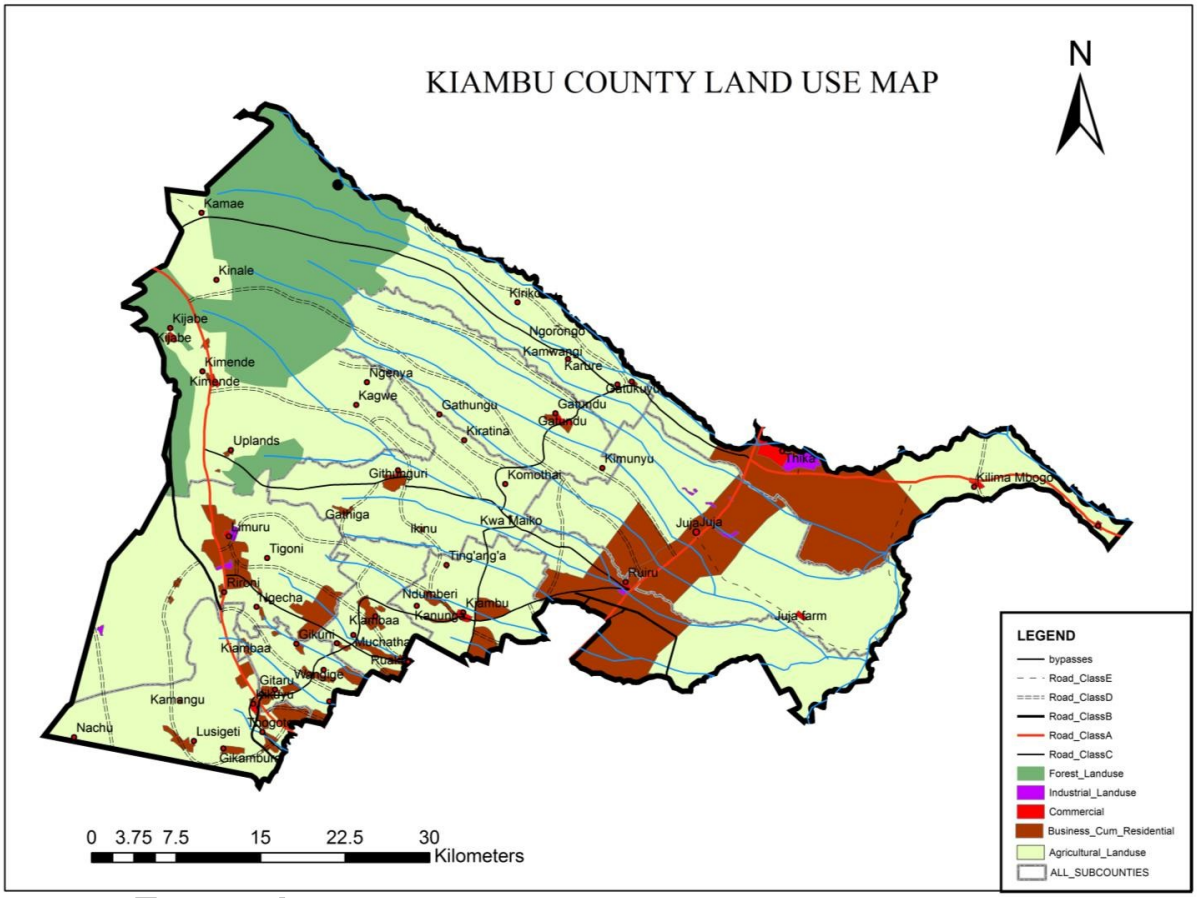


Figure 6 - Land Use in Kiambu County

Coffee and tea are the main industrial crops grown especially in the upper and lower highlands of the county. Macadamia is an upcoming crop. Production of pyrethrum is low in the county after farmers shifted to other crops. There are 21 coffee and 3 pyrethrum co-operative societies which assist in marketing of coffee and pyrethrum.

Dairy industry is the leading enterprise with nearly 70% of the farm families keeping an average of 2-3 cows under zero grazing systems. Milk is the major livestock product in Kiambu county and currently leading in Kenya. Production has increased from 264,773,621 litres in 2013 to 308,818,919 litres in 2016. In order to facilitate milk value addition, eleven bulk milk coolers with a cumulative capacity of 39,000 litres have been procured and issued to farmer dairies including Muguga, Kiriita, Mangu, Karatu, Gatamaiyu, Ndumberi, Bibirioni, Githiga and Ngewa. Two

pasteurizers procured; one of 5000 litres installed in Muguga and another of 5000 litres per hour capacity for Kiambaa.

Poultry and pig keeping continue to take precedence after dairy farming. Eggs production and pig production is the second, more so, in income generation. According to 2017 data provided by the department of Agriculture, Livestock and Fisheries Kiambu County, the numbers of livestock in the county were as follows: 247,706 cattle, 139605 Sheep, 102366 goats, 2,550,523 poultry, 52588 pigs and 10227 donkeys. Agro-processing industries in the County include Brookside Dairies, Githunguri Dairies, Ndumberi Dairies, Limuru Milk and Palmside Dairies and local food processing factories such as Farmers Choice Ltd and Kenchic Co. Ltd. The county has 216 Communal cattle dips, out of which 7 are functional and 209 are non-functional. The presence of Wangige wholesale market and Gitaru market for eggs; and Ndumbu-ini slaughter house for pigs continue to provide market outlet that favour the enterprises.

5.2.4 Fisheries

The main fish species farmed in the county is Tilapia and cat fish which are warm water species. Recreational fishery (sport fishing) is practiced mainly in Gatamaiyu fishing camp in Lari Sub County. The county has potential for cold water fish e.g. trout in Lari sub county.

5.2.5 Apiculture (bee keeping)

Having known the importance of honey to human health, adoption of bee keeping in the county has gradually increased leading to an increase in the Kgs of honey produced as well as the farmers' income. Beekeeping is scattered in the county and most farmers use Langsroth hives, Top Bar Hive and Log Hives. The production of honey has risen from 102,397 Kgs of honey produced in 2014 to 114,000 Kgs in 2017. The value of honey in KES has also increased from KES 51.2 million in 2014 to KES 56 million in 2017.

5.2.5 Main Wildlife and Wildlife Conservation Areas

Kiambu County has few wildlife resources mainly in Lari Sub County. An example is Kinale forest whose ecosystem constitutes of a dense forest with elephants, hyenas, bush baby, baboons, colobus monkeys, dik-dik, bush pigs, tree and ground squirrels, porcupines and many species of birds such as weaver, guinea fowls, sparrow among others.

Most wildlife conservation areas are also concentrated in Lari Sub County. At Kereita forest, programme of "Plantation Establishment and Livelihood Improvement Scheme" is highly done through the support of Kenya Forest Service in conjunction with the local community. Other measures include electric fence to contain wild animals.

5.2.6 Industry and Trade

Markets

The county is well endowed with 118 designated markets spread across the county. Main markets are Gatundu Modern Market in Gatundu South, Kamwangi market in Gatundu North, Juja Market in Juja Sub county, Jamhuri and Madaraka markets in Thika, Githurai and Ruiru in Ruiru Subcounty, Githunguri market in Githunguri Sub county, Wangige main Market and Wangige egg shed in Kabete sub county, Kangangi market in Kiambu Sub County, Limuru Barter Hawker market in Limuru, Karuri market in Kiambaa Sub County, Dagoretti and Kikuyu Markets in Kikuyu Sub County and Kimende market in Lari Sub county. Wangige egg shed is the biggest open egg market in the entire region of East and Central Africa.

Industrial parks

The county has a gazetted and an established industrial park; Tatu City in Ruiru Sub County. The park is also a Special Economic Zone. The county has many industries especially in Thika, Juja, Ruiru and Limuru towns with a concentration of manufacturing sub sector. There also exist many Jua Kali groups with approximately 30 officially registered. There are more than 200 bodaboda sheds for bodaboda operators across the county.

Major industries

The county host major industries for all sector of the economy with a concentration of agro-processing and manufacturing sectors. These industries act as a major source of employment and market outlet for agricultural and non-agricultural products both for domestic use and export. The agro-processing industries are spread across the county and includes Farmers Choice Ltd, Kenchic Co. Ltd, Brookside Dairies, Githunguri Dairies, Ndumberi Dairies, Limuru Milk and Palmside Dairies, among others.

Thika Sub-County has more than 58 industries which include Bidco Oil Industries, Thika Motor Vehicle dealers, Thika Pharmaceutical Manufacturers Limited, Devki Steel Mills, Broadway Bakeries, Kenblest Industry, Kel Chemicals, Thika Rubber Industries Limited, Macadamia Nuts, Campwell Industry and Kenya Tanning Extracts Limited. In Ruiru Sub-County, the major industries include Clay Works as well as Spinners and Spinners. The Bata Shoe Factory which is the country‘s major producer of leather products is located in Limuru Sub-County.

Types and Number of Businesses

The county is well endowed with all types of businesses which include mega stores, large traders, transport operators, financial services providers among others. The total number of registered business is estimated at 72,000. Thika Sub-County has the highest number of registered businesses estimated at 10,000 whereas Gatundu North Sub County has the minimum number estimated at 1,199. Mega stores, large traders and petrol filling stations are estimated at 63, 5,348, and 219 respectively. Financial services provider are spread across the county with more than 560 service providers registered.

Micro, Small and Medium Enterprise (MSME)

Kiambu County has a total of 2,647 SMEs and over 50,000 Micro Enterprises. These enterprises have boosted the county’s economy through provision of goods and services, enhancing competition, fostering innovation, generating employment and in effect made the county have the highest per capita income in the country.

5.2.7 Forest types and size of forests

The main forests types in the county are natural, plantation and private forests. Exotics are mainly planted in private farm forests but the data on the specific forest size is not available through plans to carry out a survey are in process. The county has eight gazetted forests with the major ones being Kieni and Kinale forests. The total acreage of Kiambu county gazetted forest is 40,032.81 Ha.

5.2.8 Sanitation

Kiambu County is considered as 60% urban with numerous peri-urban centres mushrooming rapidly due to land use changes. There are twelve main urban centres within the county out which five, namely, Thika, Kiambu, Limuru, Ruiru and Juja urban centres have convectional sewer treatment system. Garbage collection and disposal around the urban centres within the county of Kiambu is at 75%. The average number of residents in a household is 5persons/household, with

an average daily waste discharge of 0.53 to 0.65kg/person/day (JICA, 2010). Seventy two (72) private firms and 26 registered youth group compliment Kiambu county government in waste collection.

5.2.9 Health Access

The county has public and private health facilities spread across the county. In total, there are 505 health facilities; 108 are public health facilities, 64 are faith-based health facilities and 333 are private health facilities. The public health facilities are broken down as follows as per the KEPH levels.

- 70 Dispensaries offering Level 2 Services
- 24 Health Centres providing Level 3 Services
- 11 Hospitals providing Level 4 Services
- 3 Hospitals offering Level 5 Services

5.2.10 HIV and AIDS Prevalence Rates and Related Services

Kiambu County is ranked among the 18 high burden counties with a prevalence rate of 5.6 % according to the latest HIV estimates released in 2016. With the County ranking 6th in terms of the HIV burden in the Country, the implications of the HIV epidemic in the county are enormous as they mainly affect the young and productive members of the society. The adverse effects continue to affect all the sectors economically and socially as most resources are directed to treating the infected and other support to affected individuals and families. (Kenya HIV Estimates, 2015). To date, the county has made significant progress in the fight against HIV/AIDS. The Modes of HIV Transmission Study (MoT) report of 2008 and Kenya AIDS Indicator Survey (KAIS) in 2012 indicates the HIV prevalence for the county as still high with new HIV infections estimated at 4,273 among the adults, 1,199 among the young people (age 15-24 years), 353 among adolescent (age 11-19 years) and 76 among the children (0-14 years) annually. The total number of infected population is around 70,971.

5.2.11 Education, Skills, Literacy and Infrastructure

Pre- School Education (Early Childhood Development Education)

The county has a total population of 99,061 children falling within the age group of 3 to 5 pre-school). The total number of ECDE teachers is 5,370 with public centres having 1,200 ECDE teachers. The teacher to pupil ratio is 1:28. The total enrolment for ECDE is 99,061 pupils. There are about 33,336 pupils enrolled in public ECDE comprising 17,071 males and 16,266 females while private ECDE centres have total enrolment of 65,725. The gross enrolment rate is 71.70% with completion rate retention and transition rate falling at 95%. There are 98 schools for pupils with special needs where 3163 pupils have been enrolled.

Primary Education

There are 948 primary schools in Kiambu County out of which 476 are public and 472 are private. The total number of primary school teachers is 21,090 with teacher/pupil ratio being 1:38. The total enrolment is 326,770 with 164,539 males and 162,231 females. The gross enrolment is 106.3 percent while net enrolment rate is 96.9 percent. In addition, the number of pupils enrolled for special needs is 3055. The school infrastructure has greatly improved through devolvement of funds such as constituency development fund. Transition rate was at 80% according to county education office.

Non formal Education

Kenya Institute of Curriculum Development defines non-formal education as "an organized education activity operating outside the established formal education system". The non-formal education also targets out of school children and youth below the age of 18 years. Non formal education in the county is a flexible way of teaching both children and adult who for one reason or another are not able to attend formal schooling.

Youth polytechnics

There are 34 Vocational Training Centres in the county out of which 31 are operational and 3 are under construction. According to the county vocational education office, total enrolment in 2017 was 4,040 comprising of 2,279 regular trainees and 1,761-part time. Of these 2,418 were male and 1,622 were female. Completion and certification rate of regular trainees was estimated at 67.4 %. There were 130 instructors training different trade areas such as electrical and electronics, motor vehicle mechanics, masonry, plumbing, garment making, hairdressing and beauty, metal processing and carpentry and joinery among others.

Secondary Education

There are 365 secondary school consisting of 271 public schools and 94 private schools. The total enrolment rate is 130,473 out of which 63,939 are males while 65,534 are females. The number of students enrolled for special needs is 573. The number of teacher in private schools is 5402 while those in public schools are 7067. The gross enrolment rate is 86.4% while the dropout rate is 7.5%. The teacher to student ratio is 1:25 percent. As seen the dropout rate indicate 7.55 which shows there is need to put more effort to ensure dropout rate falls to 0%.

Tertiary Education

The county has one public university located in Juja Sub County, namely Jomo Kenyatta University of Agriculture and technology (JKUAT) and 6 private universities, namely Zetech University, Mount Kenya University, Gretsa University, St Pauls University, Presbyterian University of East Africa, Kiriri Womens University of Science and Technology. There are also 4 university campuses which include Lower Kabete campus of University of Nairobi, Upper Kabete campus of university of Nairobi, Kikuyu campus of University of Nairobi and Ruiru campus of Kenyatta University. The county also has 26 colleges of which two are teachers training colleges namely Thogoto and Kilimambogo with a total enrolment of 1,884 of which 679 are male and 1,205 are female. The total enrolment in the various universities in the county is 24,740 with 13,497 males and 11,243 females. The total number of students in colleges is 36,372 with males being 17,474 males and 18,898 females.

Adult and Continuing Education

According to the County Adult Education office, the county has a total 4,333people enrolled for the adult education classes in 162 adult learning centres spread across the sub- counties. Of these,3,135 (873 male and 2262 female) are enrolled for Adult Basic education classes where they learn basic language, simple mathematics, small business booking, health, agriculture, ICT-operating a phone and bible reading among others. 885 (253 male and 632 female) were enrolled for primary adult classes which lead to KCPE while 313 were enrolled for secondary school classes learning for KCSE. There were 144 teachers, 65 full time on full time basis and 79 part-time. The target group are youths aged 15 years and above and adults.

Technical, Vocational Education and Training

Kiambu County has two operational TVET institutions namely Thika Technical Training Institute and Kiambu Institute of Science and Technology, and two upcoming ones in Kikuyu and Gatundu

South Sub Counties. The total enrolment in 2014 in the two operational TVET/Tertiary Institutions was 7,407 comprising of 2,992 males and 4,415 females.

5.2.11 Employment

Residents of the aforementioned informal settlements are employed in both the formal as well as informal sectors of the economy. Majority of them are however either unemployed, engaged in casual employment or self-employed.

5.3 Environmental Baseline Information for Misri Settlement

Geographical Location

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground.

Misri is 2280m asl as shown on Figure 2 which is generally sloping towards the valley to the South. Soils are volcanic red soils are poorly drained during the rainy season making the not easily motorable. This will affect the road infrastructure especially before construction of the proposed structures. After construction phase, this will ultimately mitigate for this probability in future.

This informal settlement is located in Limuru Town, Limuru Constituency, Kiambu County, on a hilly sloping ground. Misri is located in the Mabrouke Sub-Location, Limuru East Location, Limuru East Ward and Limuru Sub-County, Kiambu County.

Fig. 4: Misri Informal Settlement

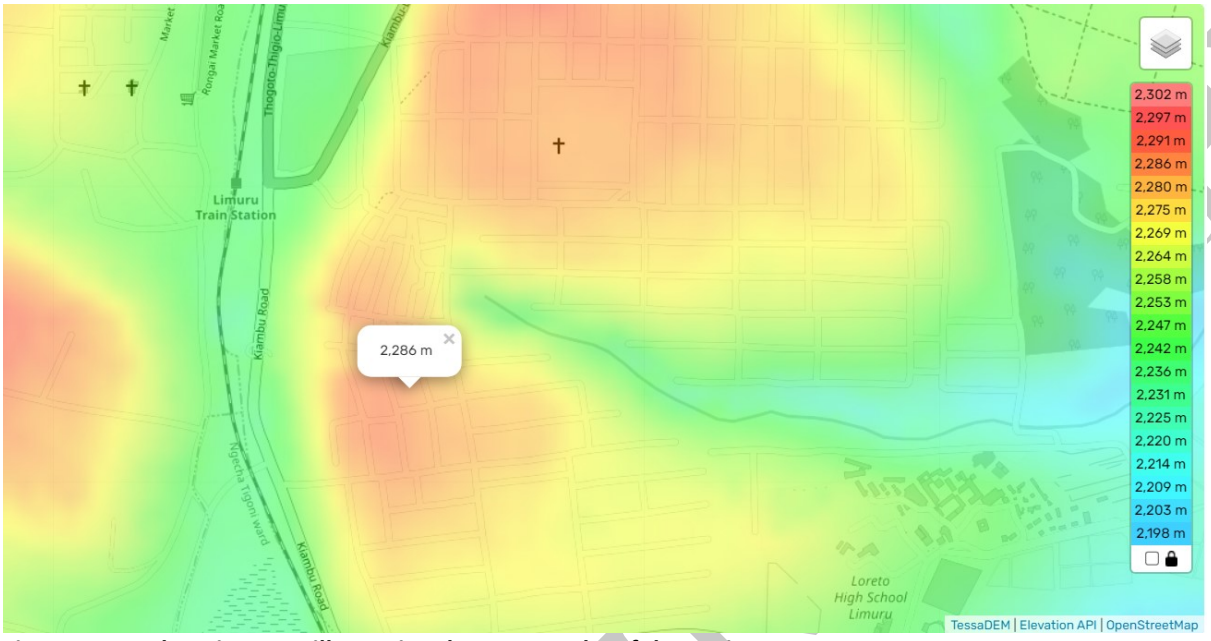


Figure 5 - An elevation map illustrating the topography of the project area

Climate and Hydrology

The project area experiences a highland equatorial type of climate with a mean annual rainfall in the region of 905 mm. The main rainfall seasons are, March to May and October to December(see *Kiambu County Integrated Development Plan 2018-2022*). The long rains are experienced from March to June while the short rainy period occurs from October to December. The mean annual rainfall in Kiambu County ranges between 800 mm and 1,300 mm per annum. The mean annual temperature ranges from minimum of 13°C to a maximum of 29°C. The coolest period is from June to September and the warmest period October to March.

Geology and Soils

The geology of Ruiru Sub-county comprises of tertiary volcanic rocks, the most important being what is termed as Nairobi Stone. The Nairobi stone is a tertiary volcanic rock used extensively for building purposes. Soils resulting from tertiary volcanic rocks are dark reddish brown, well drained, friable and very calcareous. The soils in the study area are derived from volcanic rocks that gradually occur on levels between 1200 to 2000m.a.s.l. The general nature of the soil ranges from shallow to red friable clays. The soils also support shrub vegetation and hence the area is zoned as medium potential and favourable for urban development.

Relief and physiography

Altitude of the town is about 2226 meters. The drainage pattern of the Limuru is such that the entire area can drain into the Ithanji River.

Hydrogeology

The Limuru Trachytes geological unit is the main recharge rock for the Kikuyu Springs Aquifer and the Nairobi Aquifer Suite, due to their outcrop in the watershed and the effects of faults and fractures through which groundwater movement occurs. The watershed itself is a raised fault

block (horst): the western side of the property is thus elevated on the block, while the eastern boundary runs along the downthrown valley from a second parallel fault zone.

Biodiveristy
The area has a variety of vegetation, mainly on the border fences. Exotic flora are present including Grevillea robusta trees. A variety of insects and birds are found in these vegetated spaces.

5.4 Social Economic Baseline information for Misri Settlement, Limuru Town

5.4.1 Infrastructure

Availability of Energy
The project area is seamlessly connected to the Kenya Power and Lighting Company (KPLC), with 90% of households relying on electricity as their primary source of power. In regard to the cooking energy, majority (48%) uses LGP while another 40% using charcoal.

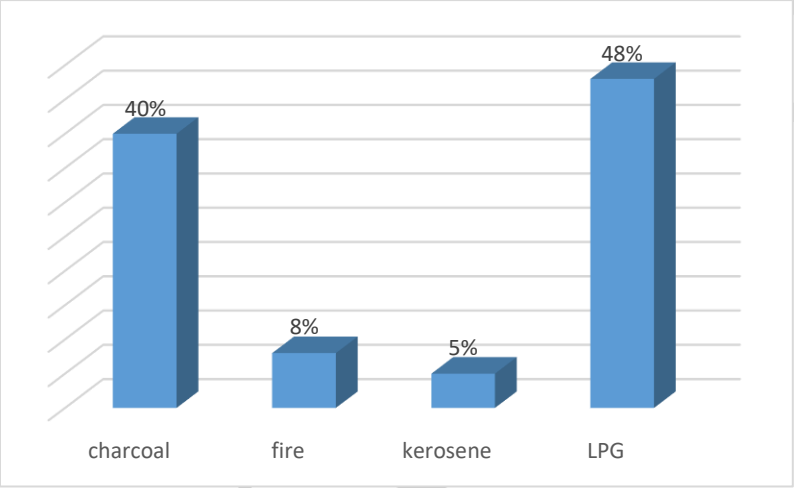


Figure 7 - Types of forms of energy used

Health Facilities
Acknowledging the pivotal role of the health sector in societal development and well-being, it is noteworthy that there are no public health facilities in the project area. The community depends on private health institutions for their healthcare needs.

Education Facilities
In terms of education facilities, Misri settlement faces a lack of public schools, reflecting a notable gap in the provision of public educational services.

Demographic and Household Information

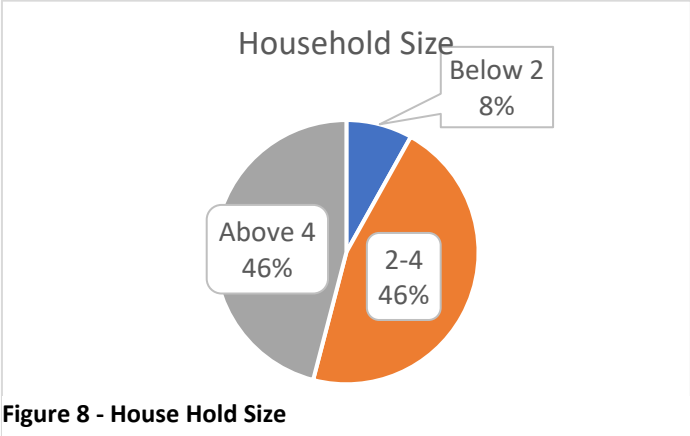


Figure 8 - House Hold Size

The comprehensive survey captured vital demographic and household information, encompassing the gender of respondents, age, marital status, level of education, area of residence, and more. A total of 37 households were surveyed, revealing a demographic distribution with 8% having below 2 persons, 46% with 2-4 members, and an equal 46% with above 4 members. This categorization provides a nuanced understanding of the household composition within the surveyed community.

Gender of Respondents

A total of 39 individuals participated in the socio-economic baseline surve , 21 of them being males representing 54% and 18 female representing 46% female of the study population

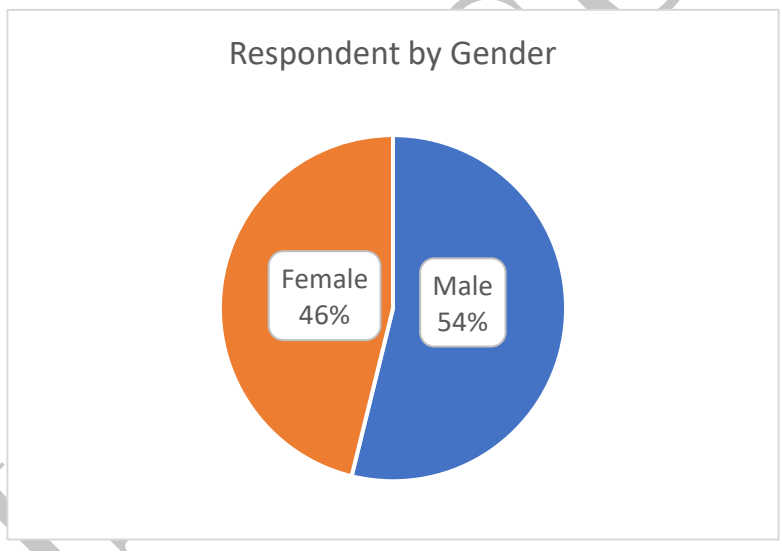


Figure 9 - Gender of Respondents

Household Head and Size

The respondents interviewed revealed that 52% of the households were headed by females, while 48% were headed by men. Furthermore, the household membership was categorized based on individual persons, illustrating that 46% of households had more than 4 persons, another 46% had 2-4 persons, and a minority of 8% had less than 2 persons per household.

These demographic insights provide a comprehensive understanding of household structures within the surveyed community.

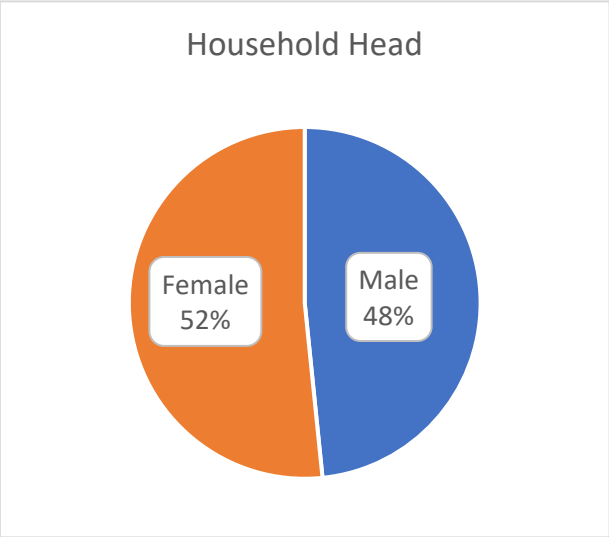


Figure 11 - Household Head

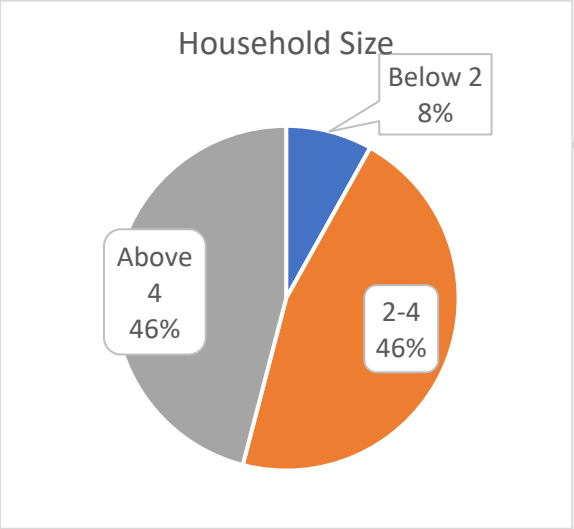


Figure 10 - Household Size

Education Status

According to the study, educational attainment among the respondents is diversified, with 54% having attended secondary education, 33% participating in tertiary education, 5% having completed primary education, and 8% indicating that they had never attended any form of education. This distribution offers a comprehensive overview of the educational backgrounds within the surveyed population.

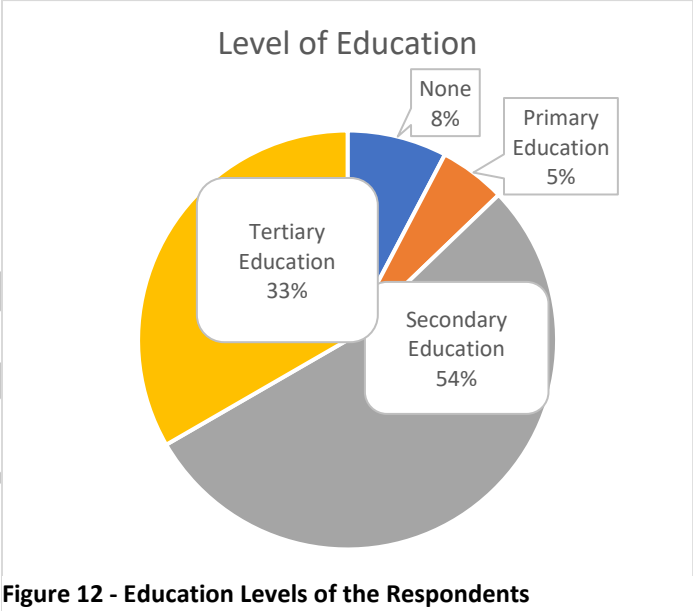


Figure 12 - Education Levels of the Respondents

Vulnerability Status of Household Head

The study revealed that among the households surveyed, 13% are headed by females, 5% by individuals living with disabilities, 8% by chronically ill persons, 38% by individuals aged above 65 years, and 36% by persons under the age of 18. This demographic breakdown provides valuable insights into the diversity of household leadership and challenges faced by various demographics within the surveyed community.

Economic Activities

Majority of the members of the population in reside in Limuru town and work in the nearby Bata Shoe Company, Tea and flower farms in Tigoni areas in Limuru.

Sources of Income

The study highlights diverse economic activities among the respondents, with a notable 20% being unemployed and 18% engaged in various business ventures. Additionally, a significant number of respondents identified as students. Interestingly, 13% are employed by private entities and an equal percentage work as civil servants. There is a noteworthy presence of 9% engaged in peasant farming, and 4% each involved in skilled service delivery and earning rental income. Trading stocks and shares represented the least prevalent economic activity among those interviewed. This variety underscores the multifaceted nature of livelihoods within the surveyed population.

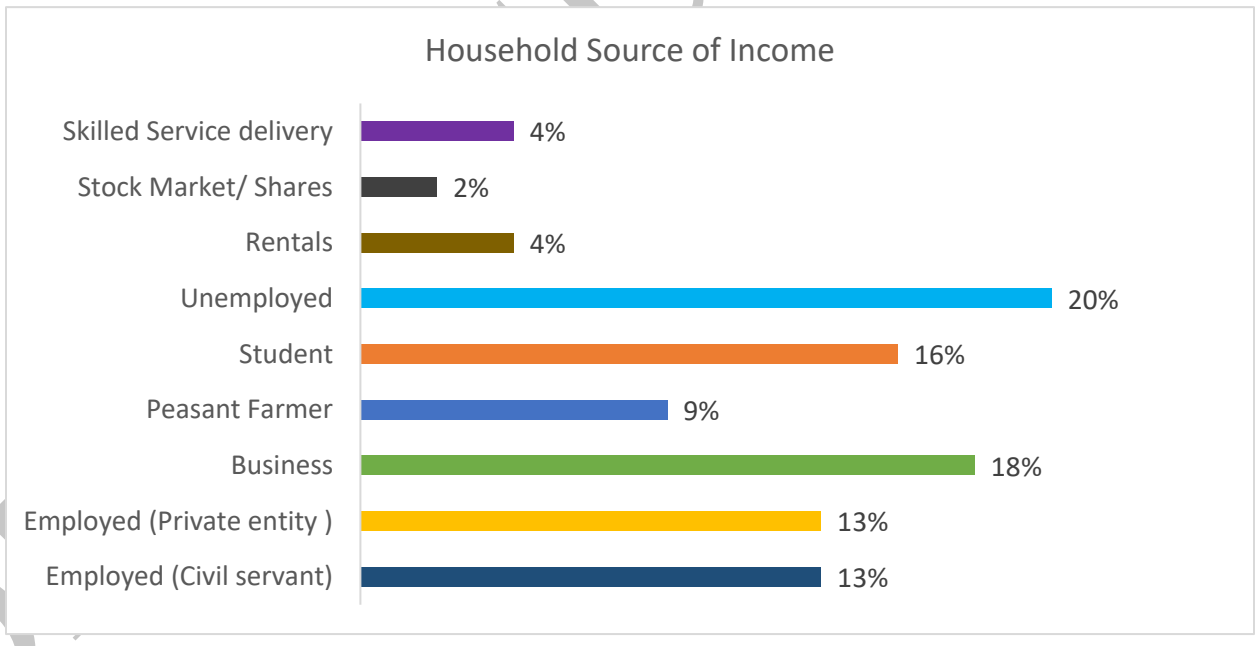


Figure 13 - Sources of Income

Monthly Household Income

The socio-economic survey revealed that the majority of respondents, constituting 59%, have a monthly income below KES 10,000. Additionally, 35% reported earning between KES 10,001-

20,000, and a smaller proportion of 6% indicated earning below KES 30,000 monthly, as depicted in the pie chart below. This income distribution provides valuable insights into the economic landscape within the surveyed community.

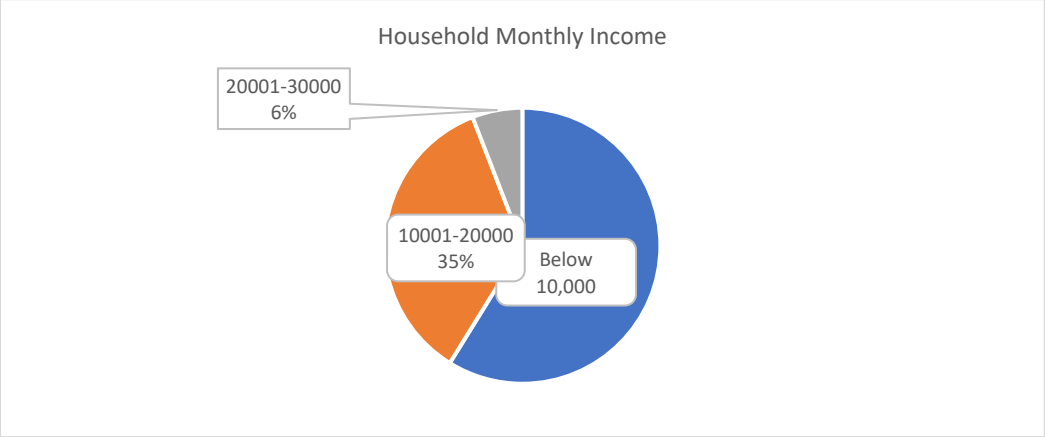


Figure 14 - Monthly Household Income

Income by gender

The study revealed that within the category of total earnings below KES 10,000, 38% are males. In the gender category earning between KES 10,001-20,000, 15% are males and 21% are females. In the category of gender earning above KES 20,001-30,000, both males and females are represented equally at 3%. This breakdown offers insights into the gender-specific distribution of income levels within the surveyed community.

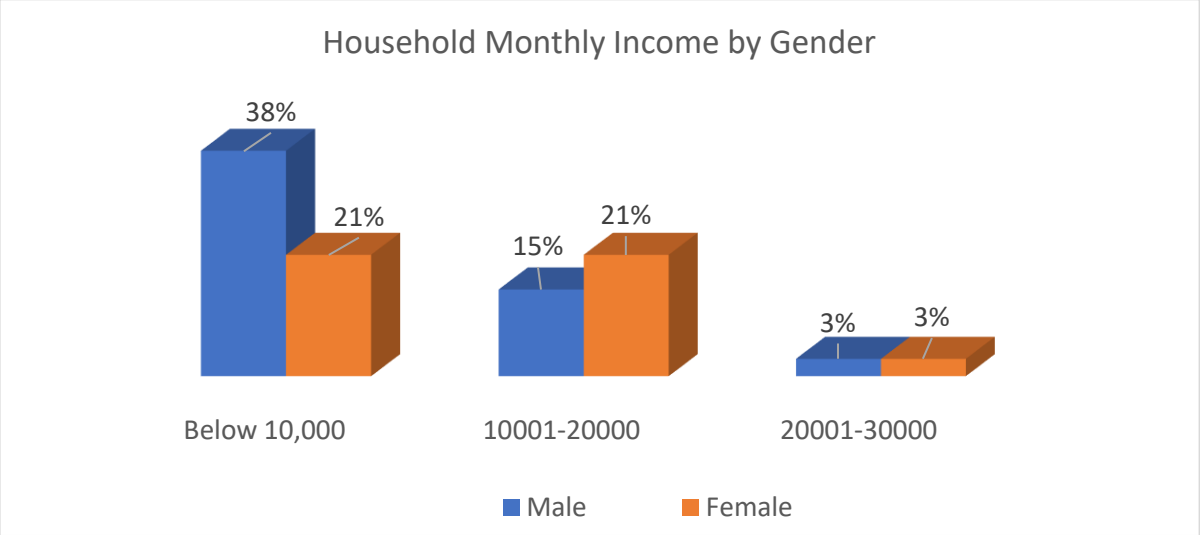


Figure 15 - Monthly Household Income by Gender

Monthly Household Expenditure

The study indicate that the monthly household expenditure varies significantly with majority of the respondents at 100% spending below KES 10,000 to 20,000 on sanitation services 77% of the population spend below KES 10,000 on food. Only 21% spends above KES 30,000 per month.

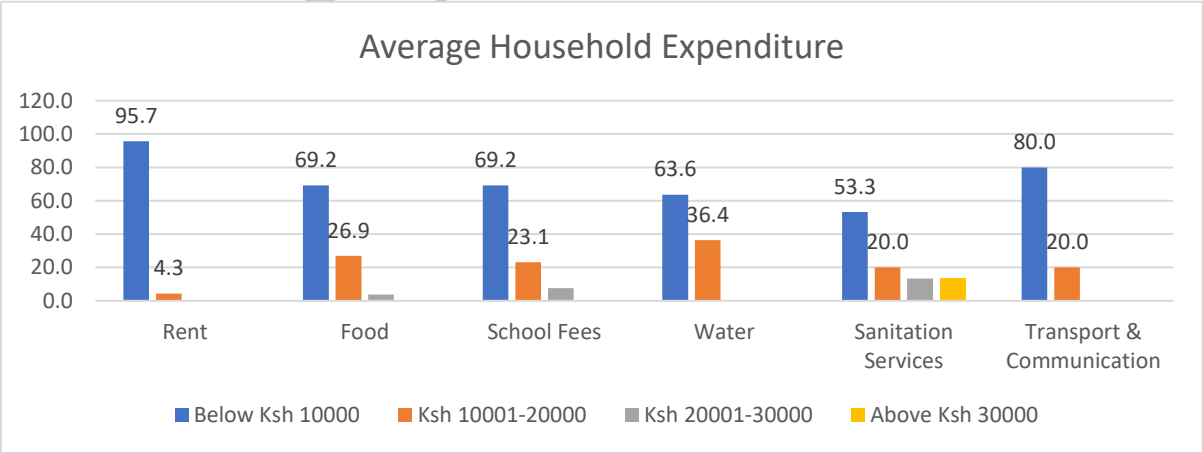


Figure 16 - Monthly Household Expenditure

Tenure Systems

Land Ownership

The majority of residents in the area, constituting 92%, are tenants, 6% have freehold ownership, and 3% are identified as squatters, as indicated in the figure below. This distribution reflects the predominant tenure arrangements within the surveyed community, providing a snapshot of the housing landscape.

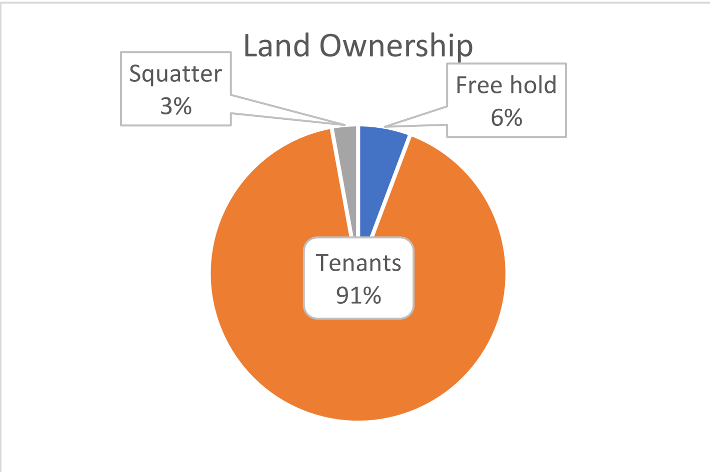


Figure 17 - Land Ownership

Housing

The majority of houses in the area exhibit diverse structural compositions. Specifically, 41% have stone walls with corrugated iron roofs, 3% feature wooden walls with corrugated iron roofs and earthed floors, another 3% have wooden walls with concrete floors, and the largest proportion, 52%, comprise iron sheets walls with corrugated iron roofs and concrete floors. This variation underscores the heterogeneous nature of housing structures within the surveyed community.

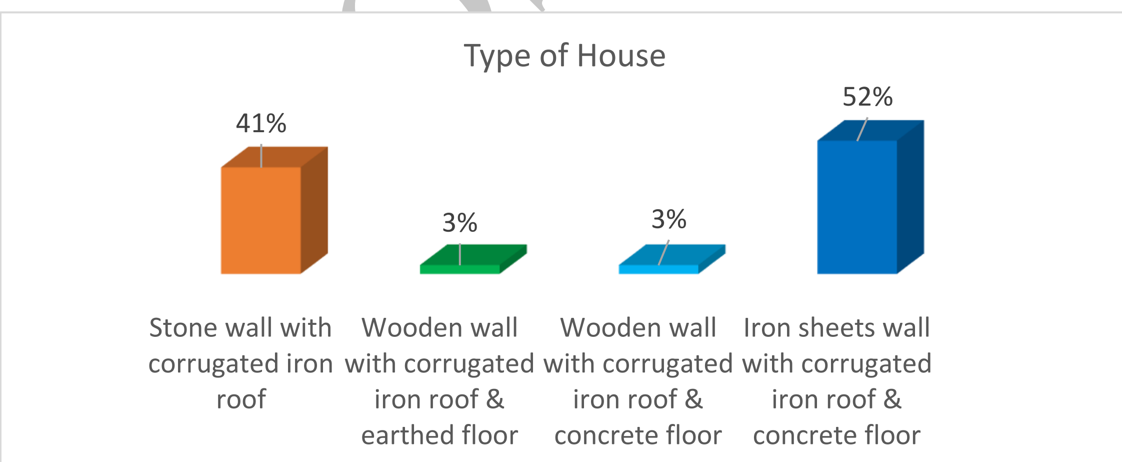


Figure 18 - Type of House

Domestic Water Supply

The primary sources of water in the project area vary, with 51% relying on plot-based water connections and 49% having individual water connections, as illustrated in Figure 4.17 below.

This distribution highlights the different water supply infrastructure configurations within the surveyed community.

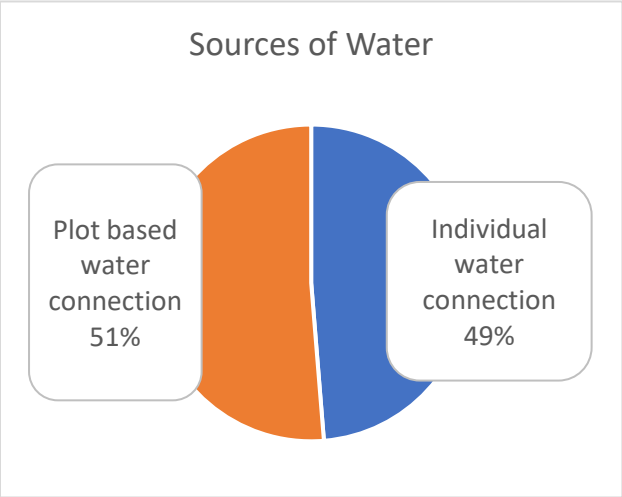


Figure 19 - Main Water Sources

Metered Connection and Amount Paid for Water

The study revealed that 51% of households have water metered connections, while 46% do not have metered connections. In terms of monthly billing, 29% of respondents use less than KES 500, 57% use between KES 1,001-2,000, and 14% utilize KES 3,000 for water metered bills. This breakdown provides insights into the prevalence of metered water connections and the associated billing patterns within the surveyed community.

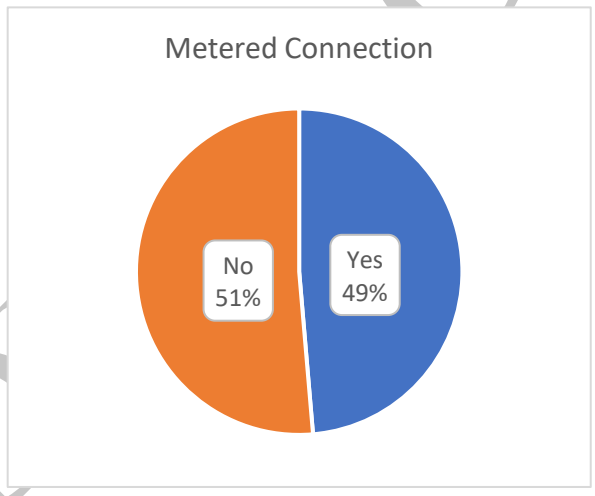


Figure 20 - : Metered Connection

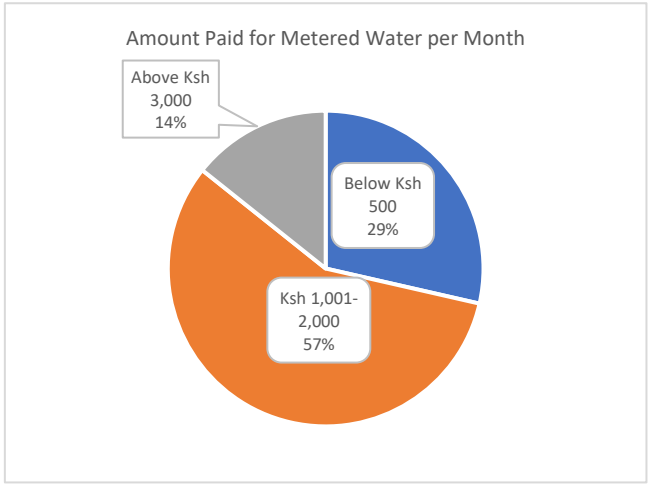


Figure 21 - Amount Paid for Metered Water per Month

Water Reliability and Payment for Services

The study indicates that 69% of respondents consider the water supply in the area reliable, while 31% find it unreliable. In terms of payment methods for water supply services, 69% of respondents use cash, 18% opt for mobile money transactions, 10% make payments through banks, and 3% do not have a specific mode for paying water services. These findings provide insights into both perceptions of water reliability and the preferred payment methods within the surveyed community.

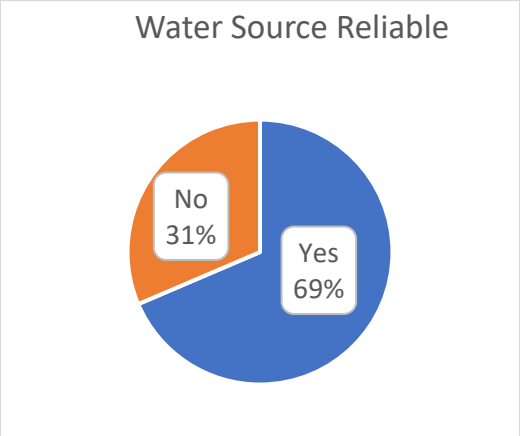


Figure 23 - Reliable Water Sources

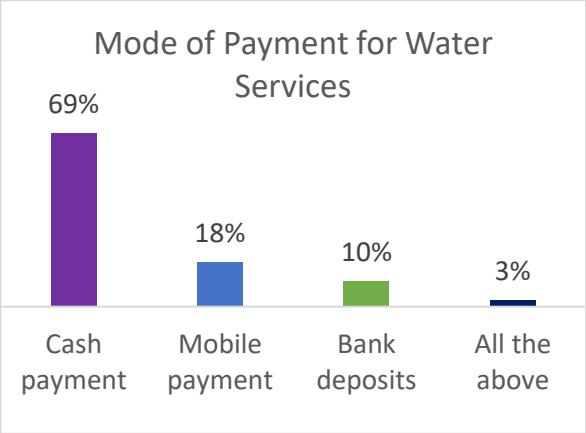


Figure 22 - Mode of Payment for Water Services

Willingness to Support Project

In addition, 100% of the respondents expressed a preference for Individual Water Metered Connection. For new water connections, 60% of respondents reported paying between KES 2,600-5,000, 30% pay KES 2,500, 5% pay KES 7,001-10,000, and only 5% pay above 10,000. These details offer insights into the unanimous preference for individual water metered connections and the associated costs for new water installations within the surveyed community.

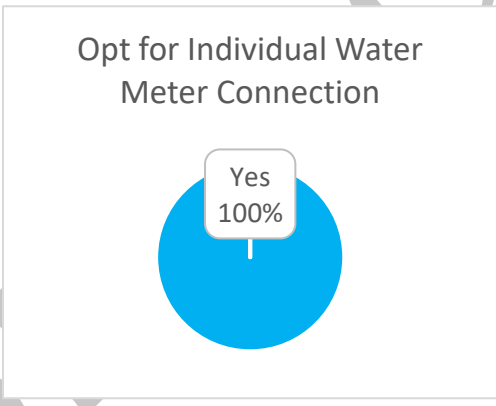


Figure 25 - Individual Water Meter Connection

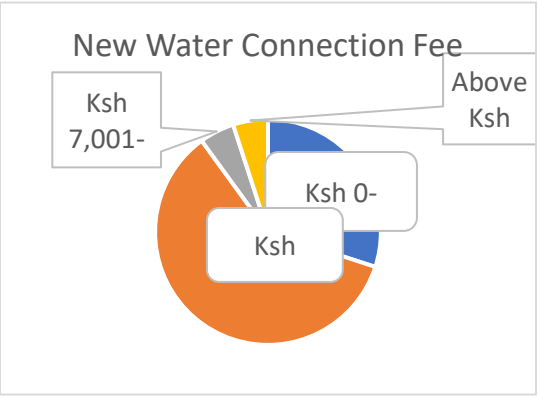
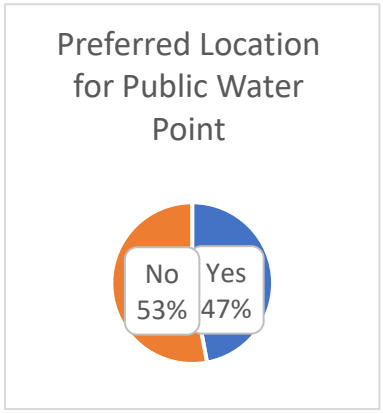
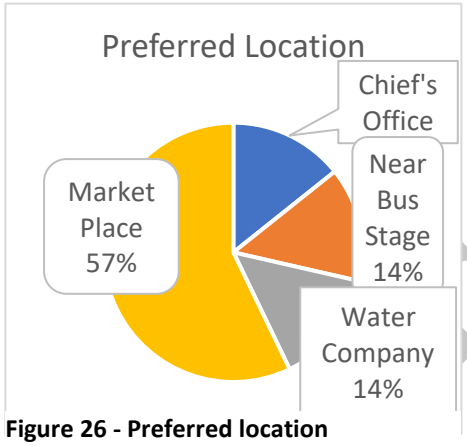


Figure 24 - New Water Connection Fee

It is crucial to highlight that 47% of respondents expressed a preference for a public water point, whereas 53% had a different preference. Among the latter group, 57% favored a location in a market place, 15% near a chief's office, 14% near a bus stage, and in a water company. Interestingly, despite varied preferences, 94% of respondents indicated a willingness to support and pay for water services if provided with good quality water in an accessible and clean environment, while only 6% expressed unwillingness to support such services. These findings underscore the diversity of opinions regarding water point locations and the overall willingness to contribute to improved water services within the surveyed community.





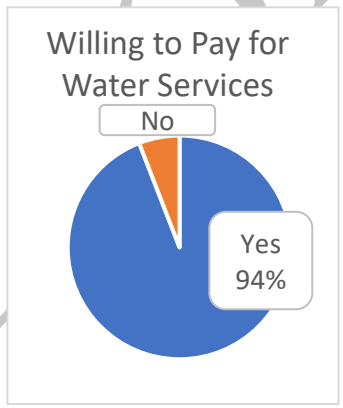


Figure 26 - Preferred location

Figure 27 - Preferred location Public Water point

Sanitation

Human Waste Disposal

Sanitary conditions play a crucial role in any human settlement, directly influencing the environment and the health of inhabitants. According to the study, 11% of respondents have access to public latrines, 19% use plot-based latrines, 50% have plot-based sewer toilets, 3% utilize individual septic-connected toilets, 3% use individual sewer-connected toilets, and 14% lack access to any sanitary facilities. These findings highlight the diverse range of sanitation facilities and the varying levels of access within the surveyed community.

Figure 28 - Willing to pay services

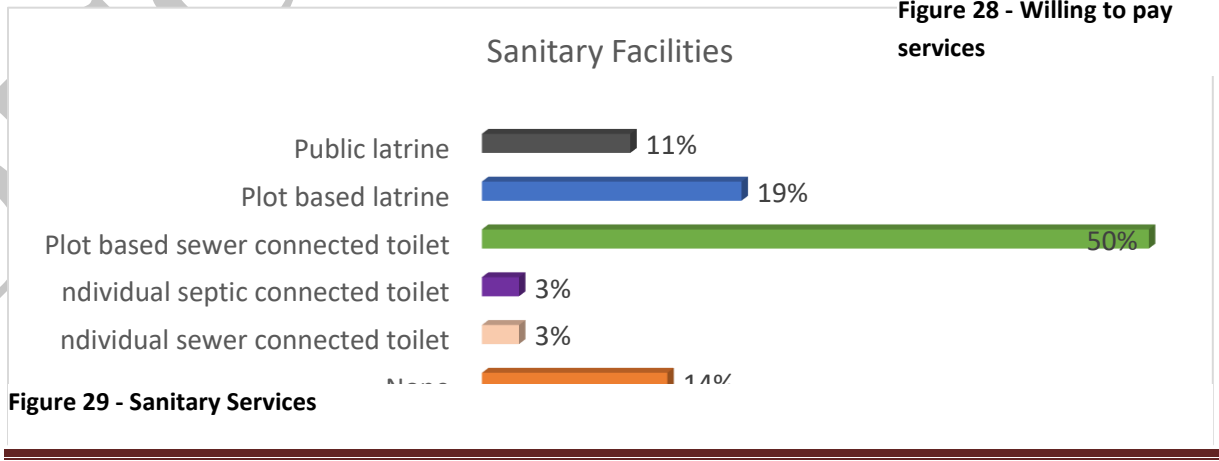


Figure 29 - Sanitary Services

Existing Toilet/Sewer System

When asked about the adequacy of existing toilet and bathroom facilities in their area, 37% of the respondents indicated that they were inadequate, 11% considered them adequate, 46% deemed them moderately adequate, and 6% expressed that they were very adequate. These responses reflect the diverse perceptions of the adequacy of sanitation facilities within the surveyed community.

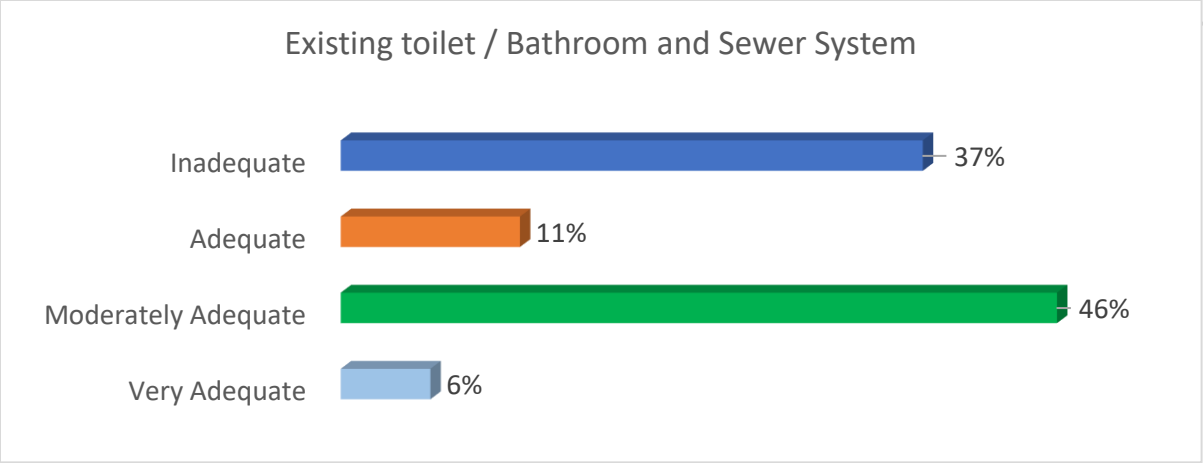


Figure 30 - Existing Sewer System

Nearest Sewer lines

Respondents were queried about the approximate distance of their households to the nearest sewer line. The findings indicate that 32% of respondents reported the sewer being located 1 - 50 meters away, 22% stated it was 50-100 meters away, 13% mentioned a distance of 100-200 meters, 14% noted a distance of over 200 meters, and 19% were not aware of the distance to the sewer. These insights provide an understanding of the proximity of households to sewer infrastructure within the surveyed community.

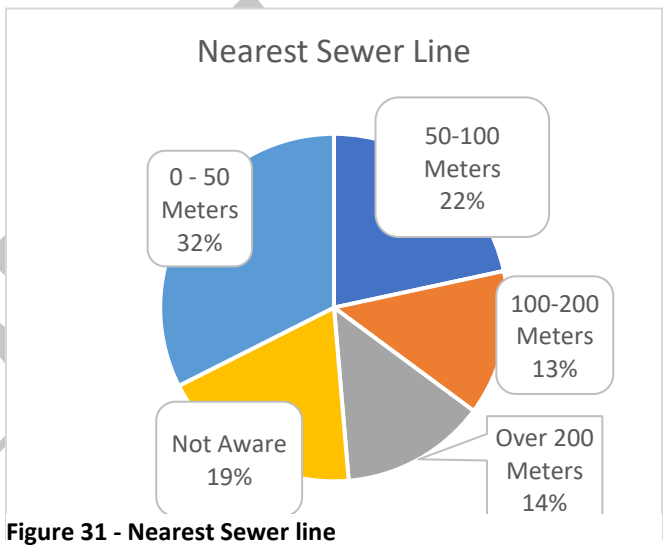


Figure 31 - Nearest Sewer line

Location for Public Toilet

When asked about suitable locations for a public toilet, respondents were divided in their preferences. A majority, comprising 89%, had no specific preference for the location of public toilets, while 11% expressed preferences for particular places. Among those with preferences, 50% opted for locations near local vendor kiosks, 25% favored areas around markets, and another 25% suggested near the chief's office. These responses highlight the varied opinions regarding the optimal locations for public toilets within the surveyed community.

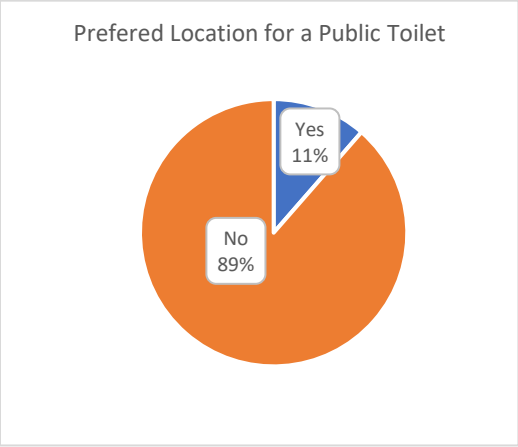


Figure 33 - Nearest Sewer line

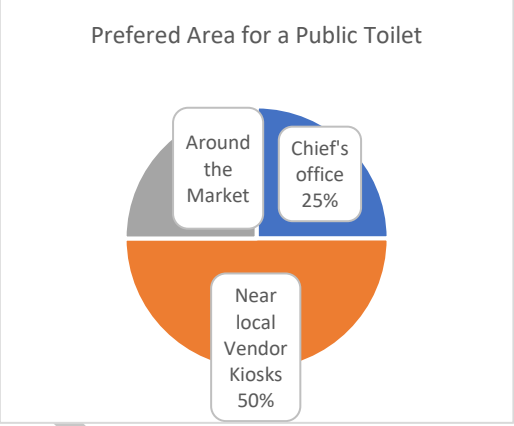


Figure 32 - Preferred Area for Public Toilet

Septic Tanks

All respondents (100%) who use septic tank/pit latrines indicated their willingness to empty these facilities promptly. Notably, 91% expressed a preference for seeking the services of the County Government, while the remaining 9% would opt for private business persons. This information underscores the predominant reliance on public services for septic tank and pit latrine maintenance within the surveyed community.

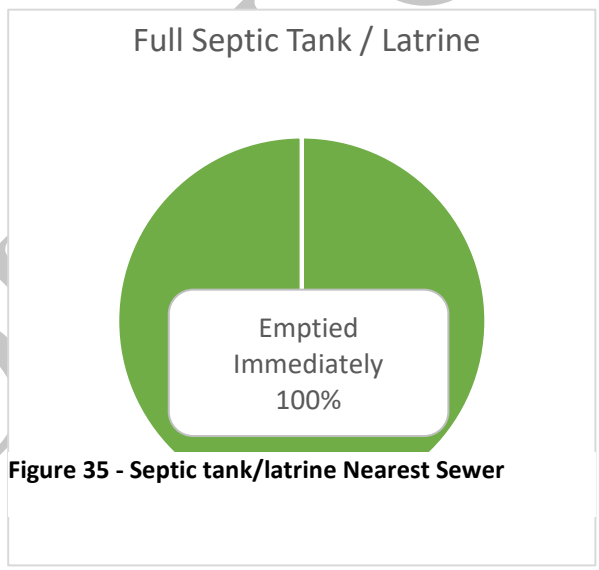


Figure 35 - Septic tank/latrine Nearest Sewer

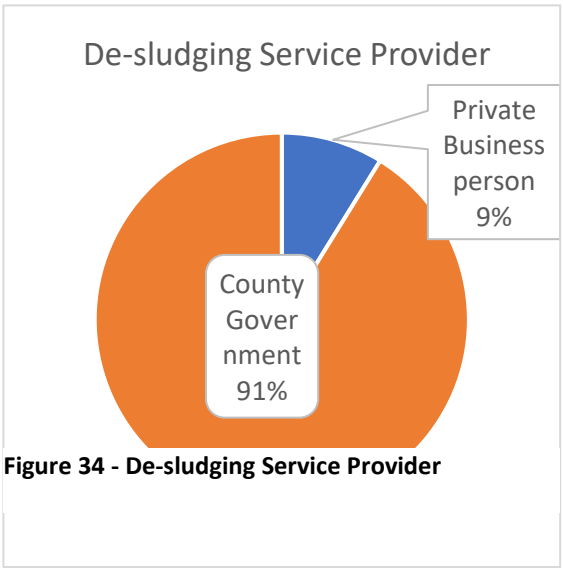


Figure 34 - De-sludging Service Provider

Desludging Pit Latrine/Septic Tank

Furthermore, 10% of respondents indicated that they dislodge or empty their septic tanks after 10 years, 3% do so once every 2 years, 26% perform the task twice in a year, 11% do it once a year, and the majority, constituting 57%, engage in this activity every 6 months, as illustrated in the chart below. These insights provide a comprehensive understanding of the frequency of septic tank maintenance practices within the surveyed community.

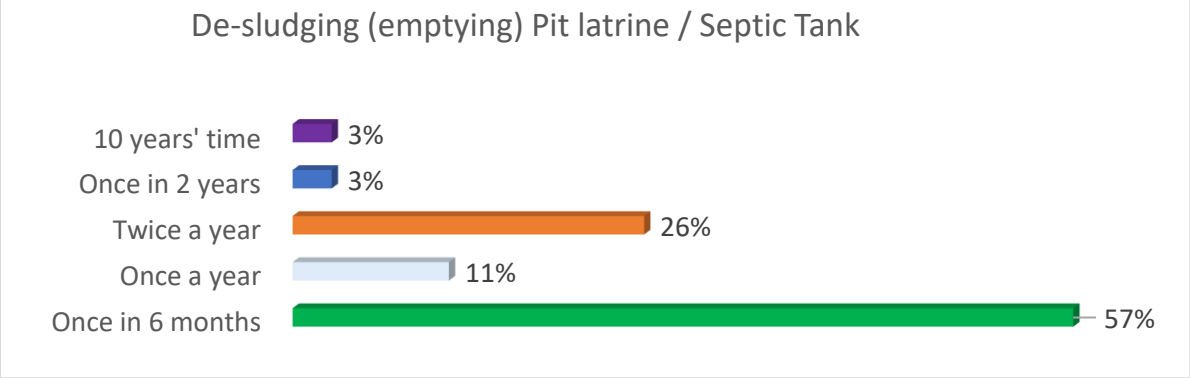


Figure 36 - Desludging latrines/septic tanks

Mechanical Desludging

Desludging can be carried out either through the use of machinery or manual methods. According to the respondents, 4% noted that they have incurred desludging costs above KES 6,000, another 4% spent between KES 4,001-6,000, 21% utilized KES 2,001-4,000, and the majority, comprising 71%, spent below KES 2,000, as illustrated in Figure 5-32 below. These findings shed light on the range of costs associated with septic tank maintenance practices within the surveyed community.

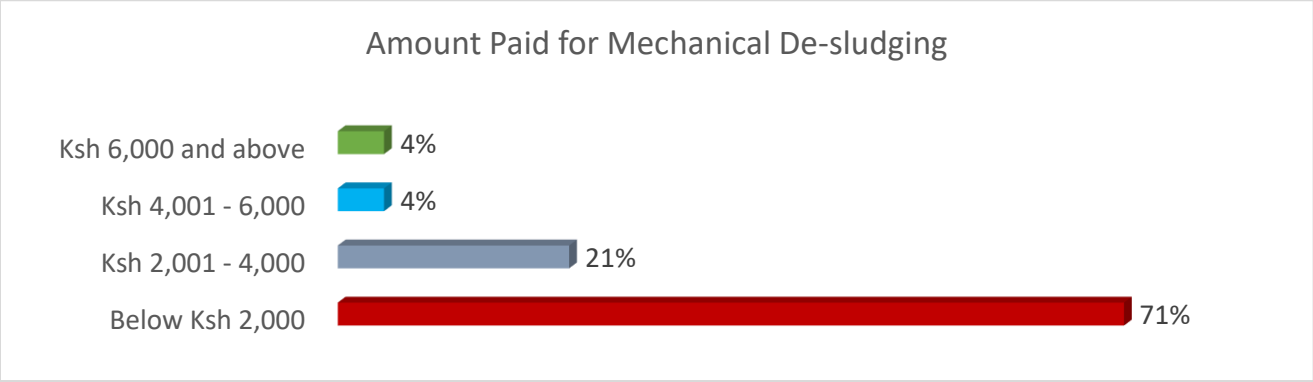


Figure 37 - Amount of paid for mechanical desludging

Manual Desludging

According to the study, 12% of the respondents reported spending above KES 6,000, 41% spent between KES 4,001-6,000, 6% spent KES 2,001-4,000, while the majority, accounting for 41%, spent below KES 2,000 in manual desludging of septic tanks/pit latrines. These figures provide

insights into the varying costs associated with manual desludging practices within the surveyed community.

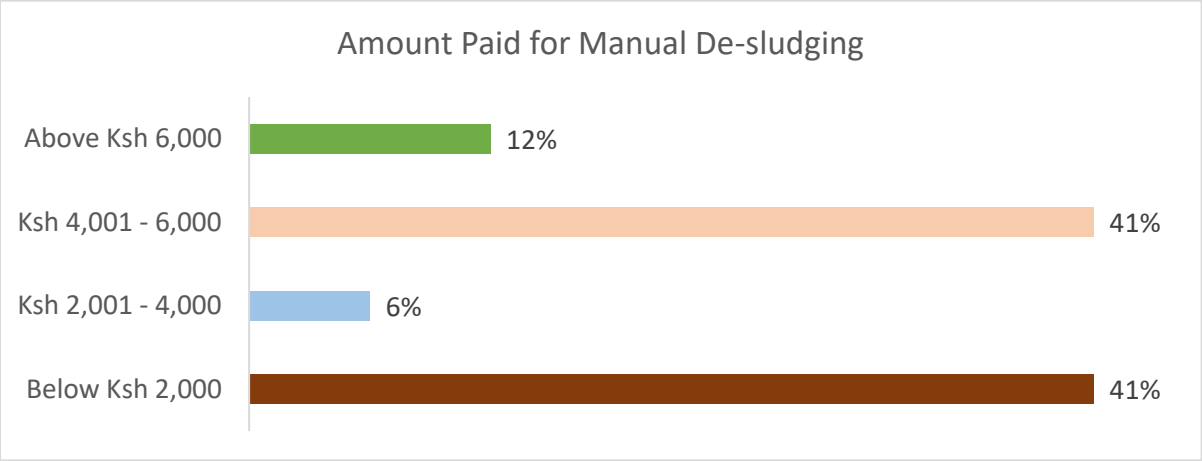


Figure 38 - Amount of paid for manual desludging

Solid Waste Management

The study indicates various methods of solid waste management in the project area. According to the findings, 19% of respondents mentioned that their garbage is collected by the County Government, 53% is managed through community garbage collection initiatives, 3% is handled by private companies, and 25% reported that waste is dumped in open spaces. These insights offer a comprehensive view of the diverse waste management practices within the surveyed community.

Figure 39 - Solid Waste Management

Security

According to the Socio-economic survey, a significant majority of respondents, comprising 94%, acknowledged the presence of security issues in the area, while only 6% disagreed with the

perception of security issues. Among the reported security concerns, 57% of respondents identified picking pockets as a major issue, 40% highlighted burglary and theft, and a smaller percentage, 3%, mentioned murder as a significant security concern. These findings provide valuable insights into the security perceptions and specific challenges faced by the community in the surveyed area.

Figure 40 - Security issues experienced

5.5 Current Project Area Photographic Description

5.5.1 Roads

Most of the roads are in very poor state, especially during rains. However, some are have gravel surface and are easily motorable.

Figure 41 - Current Road Condition

5.5.2 Houses

Majority of the houses have stone walls with corrugated iron roof; wooden wall with corrugated iron roof and concrete floor while wooden wall with corrugated iron roof and earthed floor.

Figure 42 - Existing types of Houses in the Settlement

5.5.3 Drainage Systems

Most of the area has very poor drainage systems and there is good room for improvement.

Figure 43 - Existing Drainage System in the Settlement

5.5.5 Solid garbage

Solid garbage is a major problem in the settlement. Most of it is cleared through burning.

Figure 44 - Solid Waste situation in the Settlement

CHAPTER 6: STAKEHOLDER ENGAGEMENT AND CONSULTATION

6.1 Overview

Public participation is a facilitative process of strengthening the organizational and management capacities of people in such a way that they become self-reliant in solving their own problems. It connotes the organized action of the people towards the resolution of issues or acquisition of what they desire and what may benefit them. This, then, requires that people, as a group, must have proper ownership of actions and highly organized course of action.

Effective public participation requires the availability of adequate information in public inputs. The latter involves various values, critiques, questions, information, suggestions and other inputs, which are expressed by individuals, groups or organizations among the general public in an attempt to influence decision-making.

6.2 Objectives of the Public Participation

The following objectives were considered:

- to inform the local people, leaders and other stakeholders about the proposed projects and their objectives;
- to initiate public involvement processes, in a bid to induce and cultivate a sense of peoples' belongingness to the project;
- to suggest and facilitate the peoples' roles in the project's sustainability, in terms of management, maintenance and productivity;
- to seek views, concerns, and opinions of people in the area concerning the projects;
- to establish if the local people foresee any positive or negative environmental effects from the project and if so, how they would wish the perceived impacts to be addressed; and
- to find out if there are issues or places of cultural/or religious importance to the local communities that could be negatively impacted upon by the projects

6.3 Public and Stakeholder Consultations Outcome

The initial public consultations and sensitization were done on 8th November 2023. They involved county government administration, community leaders and community groups in Misri informal settlement, Provincial Administration through the assistant chief and the SEC. These consultations provided views, opinions and suggestions on the proposed projects including feeder roads, sewer line, erection of high mast security light and water supply in the informal settlement. Further, the consultations provided views (comments, suggestions, fears and concerns) on the proposed projects in these settlements. Detailed public consultations involved conducting public meetings and key informants' discussions with the target beneficiaries and other stakeholders. The meetings were facilitated by the SEC.

Sample photos of the consultative forums

Photo of Participants of Meeting held on March 8, 2024

Field Observations:

- This area generally has un-paved roads.
- The existing road corridor has minimal encroachment of the road reserve by structures
- The area is relatively poorly lit with no street lights along major access.
- The area lacks drainage system and its prone to flooding during the rains

Impacts of the Proposed Project during Construction and Operation

Positive Impacts

- Increased land value in the settlement
- Improved road network and drainage system.
- Improved security because of the installation of high mast security lights (mulika mwizi)
- Attraction of investors due to better infrastructure and improved security
- Employment creation during the project implementation
- Increased business due to long operation hours due to improved security

Negative impacts

- Disruption of businesses during the construction
- Dust pollution during the construction
- Influx of people as infrastructure will attract people from other areas into the settlement
- Increased HIV infections as human influx is likely going to attract sex workers during and after construction
- Disposal of waste materials during the construction period

Conclusion

Generally, there is an overall appreciation for the proposed projects having emanated from the community members within the Misri informal settlement. However, the community emphasizes the need to be involved in the overall project. SEC is the entry point into the community hence the Contractor should ensure that the members are involved at all stages of the project. In so doing, this will go a long way in ensuring the smooth implementation of the project.

CHAPTER 7: IDENTIFICATION OF ENVIRONMENTAL AND SOCIAL IMPACTS AND ASSESSMENT

7.1 Overview

Infrastructures (access roads, footpaths and walkways, storm water control and other drainage infrastructures, street lighting) development are key factors in sustainable urban environmental, social and economic development of any urban centre. Increasing population and the desire for economic progress continuously increase pressure on natural resources including housing, water availability, sanitation infrastructure, waste management, land space and even appropriate environmental quality mostly in informal settlements.

Abundance of water supply occasionally leads to increased generation of wastewater (sewage and runoff) that require to be safely disposed off. Provision of these infrastructures is the most challenging development aspect in the improvement of the living standards of the informal settlements.

The main principle behind this Environmental and Social Screening is identification of impacts that may be associated with the project and to establish of how the project components will get integrated within the existing environmental, social and economic framework without creating adverse or negative impacts.

Appropriate mitigation measures are proposed for integration into the project implementation to ensure minimal impacts to the environment and the social setting. These impacts and their potential degree of impacts or impacts level of significance are summarized in Table 5 below.

Summary of Anticipated Impacts and their Mitigation Measures

Environmental/Socio-economic impact	Mitigation Measure
Pre-construction Phase	
Land Disruption	• Conduct comprehensive land surveys and assessments to identify potential areas of disruption. • Develop resettlement action plans (RAPs) for any affected communities, ensuring fair compensation
Social Discontent	• Implement robust community engagement strategies to communicate project goals and benefits. • Provide clear and transparent information about the project's potential impacts and mitigation plans.
Potential Livelihood Disturbance	• Conduct socioeconomic assessments to understand the dependency of communities on existing infrastructure. • Develop livelihood restoration programs to mitigate any disruptions, providing alternative income opportunities.
Public Opposition	• Implement targeted awareness campaigns to educate stakeholders about the project's importance and benefits. • Address misinformation and misconceptions through factual information and engagement with key influencers.
Limited Feasibility	• Clearly define the scope and objectives of feasibility studies to ensure comprehensive assessment of project viability.

Environmental/Socio-economic impact	Mitigation Measure
Focus	• Allocate sufficient resources and expertise to conduct thorough feasibility studies during the pre-construction phase.
Economic Uncertainty	• Conduct rigorous cost-benefit analyses to assess the potential economic impacts and viability of the project. • Develop contingency plans to address unexpected cost increases or revenue shortfalls during the pre-construction phase.
Perception of Insufficient Analysis	• Communicate the rationale behind the holistic project evaluation approach, emphasizing its importance in early project stages. • Provide opportunities for stakeholders to contribute feedback and suggestions for improving the analysis process.
Construction Phase	
Displacement and Resettlement:	• Ensure no additional PAPs if any are added after the cut-off date.
Air/Dust Pollution	• Control speed of construction vehicles • Prohibit idling of vehicles • Sensitise workforce • Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Plant shrubs and trees • Regular maintenance of plant and equipment. • Provide PPE to workers.
Noise pollution and vibrations	• Sensitise workforce • Supervise construction traffic • Sensitise drivers of construction vehicles • Maintain plant and equipment • Workers in the vicinity of high-level noises to wear safety & protective gear (PPE). • Impose speed limits for all vehicles in settlement.
Soil erosion	• Construct efficient drainage structures (culverts, mitre drains, scour checks etc.). • Control earthworks through cascading gabions and distribution ch6annels for storm water. • Protect excavated sections of the route of storm water during heavy rains. • Provide erosion channels to natural drains and drainage system to minimize erosion. • Design to incorporate existing drainage pattern and avoid disturbing the same.
Vegetation Loss through Clearance	• Minimize clearing of unnecessary areas at the construction site • Replant vegetation through landscaping upon completion
Employment & business opportunities	• Employment of locals in the project as semi-skilled labour.
Water Pollution	• Works to be done preferably in the dry season

Environmental/Socio-economic impact	Mitigation Measure
	• Solid waste at construction camps, and equipment maintenance workshops should not be dumped in or near any water bodies (rivers, streams, etc.) along the project or area of influence. • Proper handling, storage and disposal of oil and oil wastes • Proper disposal of wastewater
HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project • Preventives measures like use of condoms, voluntary counselling and testing
Healthy and Safety	• Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Use traffic marshals to direct traffic. • Provide PPE to workers
Increased gender recognition	• Employment of women for gender equity during the project
Security	• Use security guards to safeguard construction properties (plant and equipment, vehicles, etc.) at night.
Socio-cultural conflicts	• Sensitize migrant workers on key cultural sensitivities of the host community. • Ensure fairness in recruitment of workforce by ensuring that local people get priority of the jobs that they can perform. • Create open communication for people to channel their grievances to avoid rumours and fake news with respect to the proposed project. • Engage with local leaders at all times. • Create a project committee with representation of all actors.
Social economic impact-displacement	• Full compensation before the commencement of the works
Climate Change	• Include green and blue infrastructure into design of the project. • Minimize tree cutting in the project areas. • Any remaining riparian areas should be preserved as these act as urban green/blue corridors and support temperature regulation. • To reduce storm waters, make use of permeable surfaces for parking areas, footpaths and walkways and any other paved area to increase infiltration and reduce flooding (e.g., permeable interlocking blocks
Operation Phase	
Air/Dust Pollution	• Maintain shrubs and trees cover to reduce noises on the road
Noise pollution and vibrations	• Maintain shrubs and trees cover to reduce noises on the road
Soil erosion	• Maintain shrubs and trees cover to reduce noises on the road
Vegetation Loss	• Replenish vegetation at the open areas regularly • Proper maintenance of trees and other vegetation in open areas, e.g. along roads

Environmental/Socio-economic impact	Mitigation Measure
Employment & business opportunities	• Implement community engagement programs to address potential social and economic shifts.
Water Pollution	• Establish regular water quality testing and maintenance schedules for the water supply infrastructure
Increased Traffic	• Implement traffic management measures, such as speed bumps and designated parking areas.
Security	• Ensure street lights are working and serviced
Climate Change	• Maintain trees and other plant ornamentals cover along roadsides to provide cooling of the urban environment and thus a healthier, more resilient community. • To reduce storm waters, make use of permeable surfaces for parking areas, footpaths and walkways and any other paved area to increase infiltration and reduce flooding (e.g., permeable interlocking blocks.
Decommissioning Phase	
Air/Dust Pollution	• Control speed of construction vehicles • Prohibit idling of vehicles • Plant shrubs and trees • Regular maintenance of plant and equipment. • Provide proper PPE to workers.
Noise pollution and vibrations	• Sensitise drivers of construction vehicles • Maintain plant and equipment • Workers in the vicinity of high-level noises to wear safety & protective gear (PPE). • Impose speed limits for all vehicles in settlements
Soil erosion	• Protect excavated sections of the route of storm water during heavy rains
Resettlements	• Number of affected properties (These are contained in the ARAP Report Annex 2)
Vegetation Loss through Clearance	• Minimize clearing of unnecessary areas at the construction site • Replant vegetation through landscaping upon completion
Employment & business opportunities	• Employment of gender equity during the project
Water Pollution	• Works to be done preferably in the dry season • Proper handling, storage and disposal of oil and oil wastes • Proper disposal of wastewater
HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project • Preventives measures like use of condoms, voluntary counselling and testing
Healthy and Safety	• Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Use traffic marshals to direct traffic. • Provide proper PPE to workers

Environmental/Socio-economic impact	Mitigation Measure
Increased gender recognition	• Employment of gender equity during decommissioning where possible.
Security	• Use security guards to safeguard construction properties (plant and equipment, vehicles, etc.) at night.
Social Impacts	• Establish and communicate an effective grievance redress mechanism (GRM) • Engage with local leaders at all times. • Engage the SEC at all the times.
Climate Change	• Planting of trees and other plant ornamentals in the decommissioned contractor camp to provide cooling of the urban environment and thus a healthier, more resilient community.

CHAPTER 8: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

8.1 Overview of the ESMP

The purpose of the Environmental/Social Management & Monitoring Plan is to initiate a mechanism for implementing mitigation measures for the potential negative environmental impacts and monitor the efficiency of these mitigation measures based on relevant environmental indicators. The EMMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures can be implemented, supervised and monitored. Further, it provides a checklist for project monitoring and evaluation. The objectives of the ESMMP are:

- To provide evidence of practical and achievable plans for the management of the proposed project.
- To provide the Proponent and the relevant Lead Agencies with a framework to confirm compliance with relevant laws and regulations.
- To provide community with evidence of the management of the project in an environmentally acceptable manner.

The ESMMP outlined below will address the identified potential negative impacts and mitigation measures on the following project stages:

- Pre-construction and Construction Phases ESMP
- Operation Phase ESMP, and
- Decommissioning Phase ESMP.

Once all the operational activities have ceased, it is necessary to highlight the basic mitigation measures that will be required during the decommissioning phase of the project. Thus, the crucial objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the project.

8.2 ESMP Management Plan Principles

This project is geared towards enhancing social and economic benefits to the people living in the informal settlements under the project. The project, however, should also observe environmental protection requirements in accordance to the established laws and regulations to ensure sustainability. To realize this goal, acceptability by a majority of the beneficiaries and minimal effects to the physical environment will require to be integrated in the project through constant consultations, evaluations and review of the design aspects throughout the project coverage. It is recommended that guiding principles specific to this project and the regulations governing water resources management be developed that will allow integration of environmental management considerations in the construction, maintenance of the facility components and public amenities. Among the factors that need to be considered in this particular project implementation will include:

- Ensure prevention of pollutants discharge into the drainage systems and pollution of public water bodies,
- Enhance integration of environmental, social and economic functions in the project implementation,
- Consider preventive measures towards possible social and economic disruptions that may arise from the project implementation in accordance with the laid down guidelines,
- The contractors and other players in the project activities be prevailed upon to implement the ESMP through a sustained supervision and continuous consultations,

8.2 Environmental, Social, Management and Plan

The construction Contractor will be responsible for the implementation of the construction phase ESMMP. The Contractor will identify responsibilities and organization required to implement the accountabilities of the construction phase ESMP. The construction phase ESMP will apply to the Principal Contractor and all Sub-contractors. The Contractor will also be responsible for developing and implementing a site-specific induction for all construction workers. This induction will include all EHS hazards and their control measure. The Contractor will ensure that all construction workers are trained on basic aspects of ESMP.

The environmental management plan is summarized in **Table 19** below.

Table 19 - Environmental and Social Management and Monitoring Plan (ESMP)

Roads

Pre-Construction Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Land Disruption	- Conduct comprehensive land surveys and assessments to identify potential areas of disruption. - Develop resettlement action plans (RAPs) for any affected communities, ensuring fair compensation	Design Engineer, Project Engineer, Contractor	- Percentage of affected land surveyed and documented. - Number of households or individuals affected by land disruption.	
2	Social Discontent	- Implement robust community engagement strategies to communicate project goals and benefits. - Provide clear and transparent information about the project's potential impacts and mitigation plans.	Design Engineer, Project Engineer, Contractor	- Number of community meetings held and attendance records. - Community feedback and satisfaction levels measured through surveys or feedback sessions.	
3	Potential Livelihood Disturbance	- Conduct socioeconomic assessments to understand the dependency of communities on existing infrastructure. - Develop livelihood restoration programs to mitigate any disruptions, providing alternative income opportunities.	Design Engineer, Project Engineer,	- Percentage of households reliant on infrastructure affected by potential disturbances. - Number of livelihood restoration programs implemented and their effectiveness.	
4	Public Opposition	- Implement targeted awareness campaigns to educate stakeholders about the project's importance and benefits. - Address misinformation and	Design Engineer, Project Engineer, Contractor	- Number of informational sessions held and attendance records. - Reduction in	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		misconceptions through factual information and engagement with key influencers.		negative sentiment or opposition as evidenced by community feedback.	
5	Limited Feasibility Focus	- Clearly define the scope and objectives of feasibility studies to ensure comprehensive assessment of project viability. - Allocate sufficient resources and expertise to conduct thorough feasibility studies during the pre-construction phase.	Design Engineer, Project Engineer, Contractor	- Completeness of feasibility studies conducted, including identified risks and mitigation strategies. - Timeliness of feasibility study completion and quality of findings.	
6	Economic Uncertainty	- Conduct rigorous cost-benefit analyses to assess the potential economic impacts and viability of the project. - Develop contingency plans to address unexpected cost increases or revenue shortfalls during the pre-construction phase.	Design Engineer, Project Engineer, Contractor	- Cost projections compared to budget allocations and potential revenue streams identified. - Flexibility of budget allocations and ability to adapt to changing economic conditions.	
7	Perception of Insufficient Analysis	- Communicate the rationale behind the holistic project evaluation approach, emphasizing its importance in early project stages. - Provide opportunities for stakeholders to contribute feedback and suggestions for improving the analysis process.	Design Engineer, Project Engineer, Contractor	- Stakeholder perception surveys measuring understanding and acceptance of evaluation methods. - Number of stakeholders' suggestions incorporated into project evaluation methods.	

Construction Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Displacement and Resettlement:	• Ensure no additional PAPs if any are added after the cut-off date.	Design Engineer, Project Engineer, Contractor	Check register of PAPS	205,400.00
2	Air/Dust Pollution	• Control speed of construction vehicles • Prohibit idling of vehicles • Sensitise workforce • Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Plant shrubs and trees • Regular maintenance of plant and equipment. • Provide PPE to workers.	Design Engineer, Project Engineer, Contractor	Air quality	
3	Noise pollution and vibrations	• Sensitise workforce • Supervise construction traffic • Sensitise drivers of construction vehicles • Maintain plant and equipment • Workers in the vicinity of high-level noises to wear safety & protective gear (PPE). • Impose speed limits for all vehicles in settlement.	Design Engineer, Project Engineer, Contractor	Noise levels	
4	Soil erosion	• Construct efficient drainage structures (culverts, mitre drains, scour checks etc.). • Control earthworks through cascading gabions and distribution ch6annels for storm water.	Design Engineer, Project Engineer, Contractor	Eroded areas with bare soil and have erosion rills	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		• Protect excavated sections of the route of storm water during heavy rains. • Provide erosion channels to natural drains and drainage system to minimize erosion. • Design to incorporate existing drainage pattern and avoid disturbing the same.			
5	Vegetation Loss through Clearance	• Minimize clearing of unnecessary areas at the construction site • Replant vegetation through landscaping upon completion	Design Engineer, Project Engineer, Contractor	Bare areas	850,000.00
6	Employment & business opportunities	• Employment of locals in the project as semi-skilled labour.	Design Engineer, Project Engineer, Contractor	Number of women, youth and locals employed	
7	Water Pollution	• Works to be done preferably in the dry season • Solid waste at construction camps, and equipment maintenance workshops should not be dumped in or near any water bodies (rivers, streams, etc.) along the project or area of influence. • Proper handling, storage and disposal of oil and oil wastes • Proper disposal of wastewater	Design Engineer, Project Engineer, Contractor	Water quality values according to NEMA Water Quality standards	
8	HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project • Preventives measures like use of condoms, voluntary counselling and testing	Design Engineer, Project Engineer, Contractor	Number of condoms distributed Numbers of seminars held to	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
				sensitise staff and locals	
9	Healthy and Safety	• Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Use traffic marshals to direct traffic. • Provide PPE to workers	Design Engineer, Project Engineer, Contractor	Number of PPES issued Number of workers using PPE	
10	Increased gender recognition	• Employment of women for gender equity during the project	Design Engineer, Project Engineer, Contractor	Number of women, youth and locals employed	
11	Security	• Use security guards to safeguard construction properties (plant and equipment, vehicles, etc.) at night.	Design Engineer, Project Engineer, Contractor	Levels of security: reported numbers of incidences of robbery, theft	
12	Socio-cultural conflicts	• Sensitize migrant workers on key cultural sensitivities of the host community. • Ensure fairness in recruitment of workforce by ensuring that local people get priority of the jobs that they can perform. • Create open communication for people to channel their grievances to avoid rumours and fake news with respect to the proposed project. • Engage with local leaders at all times. • Create a project committee with representation of all actors.	Design Engineer, Project Engineer, Contractor	Number of local community members employed	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
13	Social economic impact-displacement	• Full compensation before the commencement of the works	Design Engineer, Project Engineer, Contractor	Number of people compensated	
14	Climate Change	• Minimize tree cutting in the project areas. • Any remaining riparian areas should be preserved as these act as urban green/blue corridors and support temperature regulation. • To reduce storm waters, make use of permeable surfaces for parking areas, footpaths and walkways and any other paved area to increase infiltration and reduce flooding (e.g., permeable interlocking blocks	Design Engineer, Project Engineer, Contractor	Areas planted with vegetation	1,250,000.00

Operation Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Air/Dust Pollution	• Maintain shrubs and trees cover to reduce noises on the road	Project Engineer, Contractor	Air quality	
2	Noise pollution and vibrations	• Maintain shrubs and trees cover to reduce noises on the road	Project Engineer, Contractor	Noise levels	
3	Soil erosion	• Maintain shrubs and trees cover to reduce soil erosion on the road slopes.	Project Engineer, Contractor	Eroded areas with bare soil and have erosion rills	
4	Vegetation Loss	• Replenish regularly vegetation at the bare areas	Project Engineer, Contractor	Bare areas	
5	Employment & business opportunities	• Implement community engagement programs to address potential social and economic shifts.	Project Engineer, Contractor	Employment opportunities created in the area, for	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
				example number of people starting new businesses	
6	Water Pollution	Establish regular water quality testing and maintenance schedules for the water supply infrastructure	Project Engineer, Contractor	Regular water testing reports, incident reports of water quality issues	
7	Increased Traffic	Implement traffic management measures, such as speed bumps and designated parking areas.	Project Engineer, Contractor	Traffic flow assessments, reported incidents of congestion.	
8	Security	Ensure street lights are working and serviced	Project Engineer, Contractor		
9	Climate Change	• Maintain trees and other plant ornamentals cover along roadsides to provide cooling of the urban environment and thus a healthier, more resilient community. • To reduce storm waters, make use of permeable surfaces for parking areas, footpaths and walkways and any other paved area to increase infiltration and reduce flooding (e.g., permeable interlocking blocks	Project Engineer, Contractor	Areas replanted with trees and ornamentals	

Decommissioning Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Air/Dust Pollution	• Control speed of construction vehicles • Prohibit idling of vehicles • Plant shrubs and trees	Design Engineer, Project Engineer and Contractor	Air quality	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		• Regular maintenance of plant and equipment. • Provide PPE to workers.			
2	Noise pollution and vibrations	• Sensitise drivers of construction vehicles • Maintain plant and equipment • Workers in the vicinity of high-level noises to wear safety & protective gear (PPE). • Impose speed limits for all vehicles in settlements	Design Engineer, Project Engineer, and Contractor	Noise levels	
3	Soil erosion	• Protect excavated sections of the route of storm water during heavy rains	Design Engineer, Project Engineer, Contractor	Eroded areas with bare soil and have erosion rills	
4	Vegetation Loss through Clearance	• Minimize clearing of unnecessary areas at the construction site • Replant vegetation through landscaping upon completion	Design Engineer, Project Engineer, Contractor	Bare areas	
5	Employment & business opportunities	• Employment of gender equity during the project	Project Engineer, Contractor	Number of women employed	
6	Water Pollution	• Works to be done preferably in the dry season • Proper handling, storage and disposal of oil and oil wastes • Proper disposal of wastewater	Design Engineer, Project Engineer, Contractor	Water quality values according to NEMA Water Quality standards	
7	HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project • Preventives measures like use of condoms, voluntary counselling and testing	Project Engineer, Contractor	Number of condoms distributed	
8	Healthy and Safety	• Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Use traffic marshals to direct traffic.	Project Engineer, Contractor	Number of PPES issued Number of workers using PPE	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		• Provide PPE to workers			
9	Increased gender recognition	• Employment of gender equity during decommissioning where possible.	Project Engineer, Contractor	Number of women, youth and locals employed	
10	Security	• Use security guards to safeguard construction properties (plant and equipment, vehicles, etc.) at night.	Project Engineer, Contractor	Levels of security: reported numbers of incidences of robbery, theft	
11	Social Impacts	• Establish and communicate an effective grievance redress mechanism (GRM) • Engage with local leaders at all times. • Engage the SEC at all the times.	Project Engineer, Contractor	Number of grievances received and addressed	
12	Climate Change	• Planting trees and other plant ornamentals in the decommissioned contractor camp to provide cooling of the urban environment and thus a healthier, more resilient community.	Design Engineer, Project Engineer, Contractor	Areas planted with trees and ornamentals	535,980.00

Foot paths

Pre-Construction Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Land Disruption	- Conduct comprehensive land surveys and assessments to identify potential areas of disruption. - Develop resettlement action plans (RAPs) for any affected communities, ensuring fair	Design Engineer, Project Engineer, Contractor	- Percentage of affected land surveyed and documented. - Number of households or individuals affected by land disruption.	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		compensation			
2	Social Discontent	- Implement robust community engagement strategies to communicate project goals and benefits. - Provide clear and transparent information about the project's potential impacts and mitigation plans.	Design Engineer, Project Engineer, Contractor	- Number of community meetings held and attendance records. - Community feedback and satisfaction levels measured through surveys or feedback sessions.	
3	Potential Livelihood Disturbance	- Conduct socioeconomic assessments to understand the dependency of communities on existing infrastructure. - Develop livelihood restoration programs to mitigate any disruptions, providing alternative income opportunities.	Design Engineer, Project Engineer,	- Percentage of households reliant on infrastructure affected by potential disturbances. - Number of livelihood restoration programs implemented and their effectiveness.	
4	Public Opposition	- Implement targeted awareness campaigns to educate stakeholders about the project's importance and benefits. - Address misinformation and misconceptions through factual information and engagement with key influencers.	Design Engineer, Project Engineer, Contractor	- Number of informational sessions held and attendance records. - Reduction in negative sentiment or opposition as evidenced by community feedback.	
5	Limited Feasibility Focus	- Clearly define the scope and objectives of feasibility studies to ensure comprehensive assessment of project viability. - Allocate sufficient resources	Design Engineer, Project Engineer, Contractor	- Completeness of feasibility studies conducted, including identified risks and mitigation strategies.	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		and expertise to conduct thorough feasibility studies during the pre-construction phase.		- Timeliness of feasibility study completion and quality of findings.	
6	Economic Uncertainty	- Conduct rigorous cost-benefit analyses to assess the potential economic impacts and viability of the project. - Develop contingency plans to address unexpected cost increases or revenue shortfalls during the pre-construction phase.	Design Engineer, Project Engineer, Contractor	- Cost projections compared to budget allocations and potential revenue streams identified. - Flexibility of budget allocations and ability to adapt to changing economic conditions.	
7	Perception of Insufficient Analysis	- Communicate the rationale behind the holistic project evaluation approach, emphasizing its importance in early project stages. - Provide opportunities for stakeholders to contribute feedback and suggestions for improving the analysis process.	Design Engineer, Project Engineer, Contractor	- Stakeholder perception surveys measuring understanding and acceptance of evaluation methods. - Number of stakeholder suggestions incorporated into project evaluation methods.	

Construction Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Displacement and Resettlement:	• Ensure no additional PAPs if any are added after the cut-off date.	Design Engineer, Project Engineer, Contractor	Check register of PAPS	126,620.00
2	Air/Dust Pollution	• Control speed of construction vehicles • Prohibit idling of vehicles • Sensitise workforce • Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Plant shrubs and trees • Regular maintenance of plant and equipment. • Provide PPE to workers.	Design Engineer, Project Engineer, Contractor	Air quality	
3	Noise pollution and vibrations	• Sensitise workforce • Supervise construction traffic • Sensitise drivers of construction vehicles • Maintain plant and equipment • Workers in the vicinity of high-level noises to wear safety & protective gear (PPE). • Impose speed limits for all vehicles in settlement.	Project Engineer, Contractor	Noise levels	
4	Soil erosion	• Construct efficient drainage structures (culverts, mitre drains, scour checks etc.). • Control earthworks through cascading gabions and distribution ch6annels for storm water. • Protect excavated sections of the route of storm water during heavy rains. • Provide erosion channels to natural drains and drainage system to minimize erosion.	Design Engineer, Project Engineer, Contractor	Eroded areas with bare soil and have erosion rills	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		• Design to incorporate existing drainage pattern and avoid disturbing the same.			
5	Vegetation Loss through Clearance	• Minimize clearing of unnecessary areas at the construction site • Replant vegetation through landscaping upon completion	Design Engineer, Project Engineer, Contractor	Bare areas	850,000.00
6	Employment & business opportunities	• Employment of locals in the project as semi-skilled labour.	Project Engineer, Contractor	Number of women employed	
7	Water Pollution	• Works to be done preferably in the dry season • Solid waste at construction camps, and equipment maintenance workshops should not be dumped in or near any water bodies (rivers, streams, etc.) along the project or area of influence. • Proper handling, storage and disposal of oil and oil wastes • Proper disposal of wastewater	Design Engineer, Project Engineer, Contractor	Water quality values according to NEMA Water Quality standards	
8	HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project • Preventives measures like use of condoms, voluntary counselling and testing	Project Engineer, Contractor	Number of condoms distributed Numbers of seminars held to sensitise staff and locals	
9	Healthy and Safety	• Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Use traffic marshals to direct traffic. • Provide PPE to workers	Project Engineer, Contractor	Number of PPES issued Number of workers using PPE	
10	Increased gender recognition	• Employment of women for gender equity during the project	Project Engineer, Contractor	Number of women, youth and locals employed	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
11	Security	• Use security guards to safeguard construction properties (plant and equipment, vehicles, etc.) at night.	Project Engineer, Contractor	Levels of security: reported numbers of incidences of robbery, theft	
12	Socio-cultural conflicts	• Sensitize migrant workers on key cultural sensitivities of the host community. • Ensure fairness in recruitment of workforce by ensuring that local people get priority of the jobs that they can perform. • Create open communication for people to channel their grievances to avoid rumours and fake news with respect to the proposed project. • Engage with local leaders at all times. • Create a project committee with representation of all actors.	Design Engineer, Project Engineer, Contractor	Number of local community members employed	
13	Social economic impact-displacement	• Full compensation before the commencement of the works	Design Engineer, Project Engineer, Contractor	Number of people compensated	
14	Climate Change	• Include green and blue infrastructure into design of the project. • Minimize tree cutting in the project areas. • Any remaining riparian areas should be preserved as these act as urban green/blue corridors and support temperature regulation. • To reduce storm waters, make use of permeable surfaces for parking areas, footpaths and walkways and any other paved area to increase infiltration and reduce flooding (e.g., permeable interlocking blocks	Design Engineer, Project Engineer, Contractor	Areas planted with vegetation	1,250,000.00

Operation Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Air/Dust Pollution	• Maintain shrubs and trees cover to reduce noises on the road	Project Engineer, Contractor	Air quality	
2	Noise pollution and vibrations	• Maintain shrubs and trees cover to reduce noises on the road	Project Engineer, Contractor	Noise levels	
3	Soil erosion	• Maintain shrubs and trees cover to reduce noises on the road	Project Engineer, Contractor	Eroded areas with bare soil and have erosion rills	
4	Vegetation Loss	• Replenish vegetation at the open areas regularly	Project Engineer, Contractor	Bare areas	
5	Employment & business opportunities	Implement community engagement programs to address potential social and economic shifts.	Project Engineer, Contractor	Employment opportunities created in the area, for example number of people starting new businesses	
6	Water Pollution	Establish regular water quality testing and maintenance schedules for the water supply infrastructure	Project Engineer, Contractor	Regular water testing reports, incident reports of water quality issues	
7	Increased Traffic	Implement traffic management measures, such as speed bumps and designated parking areas.	Project Engineer, Contractor	Traffic flow assessments, reported incidents of congestion.	
8	Security	Ensure street lights are working and serviced	Project Engineer, Contractor		
9	Climate Change	• Maintain trees and other plant ornamentals cover along roadsides to provide cooling of the urban environment and thus a healthier, more resilient community. • To reduce storm waters, make use of permeable surfaces for parking areas,	Project Engineer, Contractor	Areas replanted with trees and ornamentals	

Environmental or Social Impact	Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
	footpaths and walkways and any other paved area to increase infiltration and reduce flooding (e.g., permeable interlocking blocks			

Decommissioning Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Air/Dust Pollution	• Control speed of construction vehicles • Prohibit idling of vehicles • Plant shrubs and trees • Regular maintenance of plant and equipment. • Provide PPE to workers.	Design Engineer, Project Engineer and Contractor	Air quality	
2	Noise pollution and vibrations	• Sensitise drivers of construction vehicles • Maintain plant and equipment • Workers in the vicinity of high-level noises to wear safety & protective gear (PPE). • Impose speed limits for all vehicles in settlements	Design Engineer, Project Engineer, and Contractor	Noise levels	
3	Soil erosion	• Protect excavated sections of the route of storm water during heavy rains	Design Engineer, Project Engineer, Contractor	Eroded areas with bare soil and have erosion rills	
4	Vegetation Loss through Clearance	• Minimize clearing of unnecessary areas at the construction site • Replant vegetation through landscaping upon completion	Project Engineer, Contractor	Bare areas	
5	Employment & business opportunities	• Employment of gender equity during the project	Project Engineer, Contractor	Number of women, youth and locals employed	
6	Water Pollution	• Works to be done preferably in the dry season • Proper handling, storage and disposal of oil and oil wastes • Proper disposal of wastewater	Project Engineer, Contractor	Water quality values according to NEMA Water Quality standards	
7	HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project	Project Engineer, Contractor	Number of condoms distributed	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		• Preventives measures like use of condoms, voluntary counselling and testing			
8	Healthy and Safety	• Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Use traffic marshals to direct traffic. • Provide PPE to workers	Project Engineer, Contractor	Number of PPES issued Number of workers using PPE	
9	Increased gender recognition	• Employment of gender equity during decommissioning where possible.	Project Engineer, Contractor	Number of women employed	
10	Security	• Use security guards to safeguard construction properties (plant and equipment, vehicles, etc.) at night.	Project Engineer, Contractor	Levels of security: reported numbers of incidences of robbery, theft	
11	Social Impacts	• Establish and communicate an effective grievance redress mechanism (GRM) • Engage with local leaders at all times. • Engage the SEC at all the times.	Project Engineer, Contractor	Number of grievances received and addressed	
12	Climate Change	• Planting trees and other plant ornamentals in the decommissioned contractor camp to provide cooling of the urban environment and thus a healthier, more resilient community.	Design Engineer, Project Engineer, Contractor	Areas planted with trees and ornamentals	535,980.00

Street Lighting

Pre-Construction Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Land Disruption	- Conduct comprehensive land surveys and assessments to identify potential areas of disruption. - Develop resettlement action plans (RAPs) for any affected communities, ensuring fair compensation	Project Engineer, Contractor	- Percentage of affected land surveyed and documented. - Number of households or individuals affected by land disruption.	
2	Social Discontent	- Implement robust community engagement strategies to communicate project goals and benefits. - Provide clear and transparent information about the project's potential impacts and mitigation plans.	Project Engineer, Contractor	- Number of community meetings held and attendance records. - Community feedback and satisfaction levels measured through surveys or feedback sessions.	
3	Potential Livelihood Disturbance	- Conduct socioeconomic assessments to understand the dependency of communities on existing infrastructure. - Develop livelihood restoration programs to mitigate any disruptions, providing alternative income opportunities.	Project Engineer, Contractor	- Percentage of households reliant on infrastructure affected by potential disturbances. - Number of livelihood restoration programs implemented and their effectiveness.	

Construction Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Air/Dust Pollution	• Control speed of construction vehicles • Prohibit idling of vehicles • Regular maintenance of plant and equipment. • Provide PPE to workers.	Design Engineer, Project Engineer, Contractor and	Air quality	
2	Noise pollution and vibrations	• Sensitise workforce • Supervise construction traffic • Sensitise drivers of construction vehicles • Maintain plant and equipment •	Design Engineer, Project Engineer, Contractor	Noise levels	
3	HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project • Preventives measures like use of condoms, voluntary counselling and testing	Project Engineer, Contractor	Number of condoms distributed Numbers of seminars held to sensitise staff and locals	
4	Healthy and Safety	• Water should be sprayed during the construction phase on excavated areas, deviations routes, and temporary access roads • Use traffic marshals to direct traffic. • Provide PPE to workers	Design Engineer, Project Engineer, Contractor	Number of PPES issued Number of workers using PPE	
5	Increased gender recognition	• Employment of women for gender equity during the project	Design Engineer, Project Engineer, Contractor	Number of women employed	

Operation Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Energy Consumption	• Reduce energy consumption by use or solar energy photovoltaic cells	Design Engineer, Project Engineer, Contractor	Air quality	
2	Security	Make sure that photovoltaic cells are well secure from theft and vandalism	Project Engineer, Contractor		

Decommissioning Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Air/Dust Pollution	• Provide PPE to workers.	Project Engineer and Contractor	Air quality	
2	Noise pollution and vibrations	• Workers in the vicinity of high-level noises to wear safety & protective gear (PPE).	Project Engineer, and Contractor	Noise levels	

The Drainage system

Pre-Construction Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Land Disruption	- Conduct comprehensive land surveys and assessments to identify potential areas of disruption. - Develop resettlement action	Design Engineer, Project Engineer, Contractor	- Percentage of affected land surveyed and documented.	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		plans (RAPs) for any affected communities, ensuring fair compensation		- Number of households or individuals affected by land disruption.	
2	Social Discontent	- Implement robust community engagement strategies to communicate project goals and benefits. - Provide clear and transparent information about the project's potential impacts and mitigation plans.	Design Engineer, Project Engineer, Contractor	- Number of community meetings held and attendance records. - Community feedback and satisfaction levels measured through surveys or feedback sessions.	
3	Potential Livelihood Disturbance	- Conduct socioeconomic assessments to understand the dependency of communities on existing infrastructure. - Develop livelihood restoration programs to mitigate any disruptions, providing alternative income opportunities.	Contractor, Consultant, County Government, KISIP Team, SEC, GRC	- Percentage of households reliant on infrastructure affected by potential disturbances. - Number of livelihood restoration programs implemented and their effectiveness.	
4	Public Opposition	- Implement targeted awareness campaigns to educate stakeholders about the project's importance and benefits.	Design Engineer, Project Engineer, Contractor	- Number of informational sessions	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		- Address misinformation and misconceptions through factual information and engagement with key influencers.		held and attendance records. - Reduction in negative sentiment or opposition as evidenced by community feedback.	
5	Limited Feasibility Focus	- Clearly define the scope and objectives of feasibility studies to ensure comprehensive assessment of project viability. - Allocate sufficient resources and expertise to conduct thorough feasibility studies during the pre-construction phase.	Design Engineer, Project Engineer, Contractor	- Completeness of feasibility studies conducted, including identified risks and mitigation strategies. - Timeliness of feasibility study completion and quality of findings.	
6	Economic Uncertainty	- Conduct rigorous cost-benefit analyses to assess the potential economic impacts and viability of the project. - Develop contingency plans to address unexpected cost increases or revenue shortfalls during the pre-construction phase.	Design Engineer, Project Engineer, Contractor	- Cost projections compared to budget allocations and potential revenue streams identified. - Flexibility of budget allocations and ability to adapt to changing	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
				economic conditions.	
7	Perception of Insufficient Analysis	- Communicate the rationale behind the holistic project evaluation approach, emphasizing its importance in early project stages. - Provide opportunities for stakeholders to contribute feedback and suggestions for improving the analysis process.	Design Engineer, Project Engineer, Contractor	- Stakeholder perception surveys measuring understanding and acceptance of evaluation methods. - Number of stakeholder suggestions incorporated into project evaluation methods.	

Construction Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Displacement and Resettlement:	• Ensure no additional PAPs if any are added after the cut-off date.	Design Engineer, Project Engineer, Contractor	Check register of PAPS	126,620.00
2	Air/Dust Pollution	• Control speed of construction vehicles • Prohibit idling of vehicles • Sensitise workforce • Water should be sprayed during the construction phase on excavated areas, deviations	Design Engineer, Project Engineer, Contractor	Air quality	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		routes, and temporary access roads • Plant shrubs and trees • Regular maintenance of plant and equipment. • Provide PPE to workers.			
3	Noise pollution and vibrations	• Sensitise workforce • Supervise construction traffic • Sensitise drivers of construction vehicles • Maintain plant and equipment • Workers in the vicinity of high-level noises to wear safety & protective gear (PPE). • Impose speed limits for all vehicles in settlement.	Contractor, Design Engineer, Project Engineer, Contractor	Noise levels	
4	Soil erosion	• Construct efficient drainage structures (culverts, mitre drains, scour checks etc.). • Protect excavated sections of the route of storm water during heavy rains. • Provide erosion channels to natural drains and drainage system to minimize erosion. • Design to incorporate existing drainage pattern and avoid disturbing the same.	Design Engineer, Project Engineer, Contractor	Eroded areas with bare soil and have erosion rills	
5	Vegetation Loss through Clearance	• Minimize clearing of unnecessary areas at the construction site • Replant vegetation through landscaping upon completion	Design Engineer, Project Engineer, Contractor	Bare areas	850,000.00

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
6	Employment & business opportunities	• Employment of locals in the project as semi-skilled labour.	Project Engineer, Contractor	Number of women, youth and locals employed	
7	Water Pollution	• Works to be done preferably in the dry season	Design Engineer, Project Engineer, Contractor	Water quality values according to NEMA Water Quality standards	
8	HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project • Preventives measures like use of condoms, voluntary counselling and testing	Project Engineer, Contractor	Number of condoms distributed Numbers of seminars held to sensitise staff and locals	
9	Healthy and Safety	• Provide PPE to workers	Project Engineer, Contractor	Number of PPES issued	
10	Increased gender recognition	• Employment of women for gender equity during the project	Project Engineer, Contractor	Number of women, youth and locals employed	
11	Social economic impact-displacement	• Full compensation before the commencement of the works	Project Engineer, Contractor	Number of people compensated	
12	Climate Change	• Any remaining riparian areas should be preserved as these act as urban green/blue corridors and support temperature regulation.	Project Engineer, Contractor	Areas planted with vegetation	1,250,000.00

Operation Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Soil erosion	• Maintain shrubs and trees cover to reduce noises on the road	Project Engineer, Contractor	Eroded areas with bare soil and have erosion rills	

Decommissioning Phase

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
1	Air/Dust Pollution	• Provide PPE to workers.	Project Engineer and Contractor	Air quality	
2	Noise pollution and vibrations	• Workers in the vicinity of high-level noises to wear safety & protective gear (PPE).	Project Engineer, and Contractor	Noise levels	
3	Soil erosion	• Protect excavated sections of the route of storm water during heavy rains	Project Engineer, and Contractor	Eroded areas with bare soil and have erosion rills	
5	Vegetation Loss through Clearance	• Minimize clearing of unnecessary areas at the construction site • Replant vegetation through landscaping upon completion	Project Engineer, and Contractor	Bare areas	
6	Employment & business opportunities	• Employment of gender equity during the project	Project Engineer, Contractor	Number of women, youth and locals employed	
7	Water Pollution	• Works to be done preferably in the dry season • Proper handling, storage and disposal of oil and oil wastes and spoil	Project Engineer, and Contractor	Water quality values according to NEMA Water Quality standards	
8	HIV/AIDS	• Sensitisation and awareness campaign in the communities along the project	Project Engineer, and Contractor	Number of condoms distributed	

Environmental or Social Impact		Proposed Mitigation and Aspects of Monitoring	Responsibility for Intervention and Monitoring	Monitoring Parameters	Estimated Costs of Environmental and Social Mitigations (KES)
		• Preventives measures like use of condoms, voluntary counselling and testing			
9	Healthy and Safety	• Provide PPE to workers	Project Engineer, and Contractor	Number of PPES issued Number of workers using PPE	
10	Increased gender recognition	• Employment of gender equity during decommissioning where possible.	Project Engineer, and Contractor	Number of women employed	
11	Security	• Use security guards to safeguard construction properties (plant and equipment, vehicles, etc.) at night.	Project Engineer, and Contractor	Levels of security: reported numbers of incidences of robbery, theft	
12	Social Impacts	• Engage with local leaders at all times.	Project Engineer, and Contractor	Number of grievances received and addressed	
13	Climate Change	• Planting trees and other plant ornamentals in the decommissioned areas	Project Engineer, and Contractor	Areas planted with trees and ornamentals	535,980.00

8.2 ESMP Management Responsibilities

In order to implement the management plan, it is recommended that a supervisor is identified to oversee environment and management aspects including the water abstraction sustainability, pollution control, water loss control and equity access, management of sanitation and hygiene measures throughout the project area. The supervisor would also be expected to co-ordinate and monitor environmental management during construction and provide monitoring schedules during operations. Other recommended participants could include the respective NEMA County Director of Environment, the Physical Planning Offices as well as other relevant offices. The responsibility relationship is as follows:

i. KISIP 2 and County Government of Kiambu will be responsible for coordination activities and liaisons, particularly in regard to the identification of project sites, construction and social linkages.
ii. KISIP 2 and County Government of Kiambu will liaise with NEMA County Director of Environment on matters of environmental and social nature. The beneficiary communities will be responsible for overseeing the implementation of the environmental management plan established under this report.
iii. The National Environmental Management Authority through the County Director of Environment shall be responsible of surveillance of environmental and social aspects of the project implementation. It will be expected that the concerns will be communicated through the public relations person for prompt attention whenever they arise.
iv. Stakeholder project liaison committees will be fully responsible for sensitizing the respective project beneficiaries and local stakeholders on matters associated with the project. The Committees to be established for project areas will be responsible for presenting their interests.

8.3 Monitoring of ESMP

Key features of the Monitoring Plan include an identification of stakeholders responsible for mitigation, source of funds for mitigation and objectively verifiable Indicators (criteria) for monitoring.

Monitoring will take place at **four** levels:

(i) Community Level Monitoring: The Community will be assisted to undertake routine monitoring of operations of their project. Important criteria for monitoring include membership numbers, subscriptions, default rate, status of maintenance, frequency and attendance to meetings, pending maintenance cases and reasons thereof, complaints, emergent environmental concerns, solutions proposed, etc.

(ii) Internal Monitoring: The project will be monitored internally at 2 levels as follows:

County Level: The environmental specialist member of the County PCT will be responsible for all monitoring as follows:

- Pre-ESIA Screening
- Management of the ESIA Stage to develop the ESMP
- Application of the ESMP in routine monitoring
- Overseeing statutory Annual Environmental auditing

Ministry Level: The Environmental and Social Specialists at KISIP PCT will be responsible for establishment of M&E system, capacity building and backstopping counties. The specialist will prepare quarterly and annual reports regarding the application of this ESMF in the project.

(iii) External Monitoring: The KISIP will be subjected to external monitoring by the World Bank.

Both internal and external monitoring will be guided by the ESMP to generate information on:

- Nature of impacts at each project phase and whether the impact was anticipated.

- Proposed Mitigation Activity for anticipated impacts and possible mitigation of emergent impacts.
- General sensitivity of the ESMP to project impacts.
- Responsibility for mitigating old and emergent impacts.
- Success or otherwise in mitigation of anticipated and new impacts and reasons for non-achievement.
- Effectiveness of all players in the ESMP and reasons for non-performance.

Mitigation Measures

- Effectiveness or otherwise of the OVIs (Objectively Verifiable Indicators) in securing implementation of impact mitigation and measures required to tighten the process.
- Flow of information in the monitoring process and reasons for non-achievement.

(iv) Statutory monitoring: Sections 68 and 69 of the Environmental Management and Coordination Act (EMCA-1999) require all projects to prepare Annual Audit reports for Review by NEMA. Part V of the Legal Notice 101 defines the focus and scope of Environmental Audit studies as follows: - 'In carrying out of the Environmental Audit study under these regulations, the auditor shall ensure that an appraisal of all the project activities, including the production of goods and services, is carried out giving adequate consideration to environmental regulatory frameworks, environmental health and safety measures and sustainable use of natural resources.' In line with this requirement, Counties will prepare and submit audit reports for all investments to NEMA at least a year after commissioning, and thereafter as required. Counties are also encouraged to undertake annual self-auditing.

8.4 Periodic review of the ESMP

Based on information accruing from all monitoring, the efficacy of the ESMP will be reviewed and updated accordingly. The observation here is that, the ESMP will be updated periodically by KISIP and counties after Monitoring Missions.

CHAPTER 9: GRIEVANCE REDRESS MECHANISM

9.1 Procedures for Grievance Redress

9.1.1 Overview

Grievance Redress Mechanisms (GRM) are necessary avenues for allowing project affected persons to voice concerns about the resettlement and compensation process as they arise and, if necessary, for corrective action to be taken promptly. Such mechanisms are important to achieve transparency in the resettlement processes. Arising from the above observations, the Consultant proposes that all the grievances be addressed before commencing construction.

A well-defined Grievance Redress Mechanism that provides the PAPs with an avenue of lodging complaints and concerns and receiving quick/timely response is critical. Grievance mechanisms are important to the resettlement process as they allow for RAP implementers to identify disputes in good time and allow for them to be resolved in a transparent and accountable manner. Compensation based disputes are issues also likely to occur during and after the RAP implementation program, hence it is critical to establish this system prior to implementation of the resettlement program. A well established and validated grievance mechanism can also promote good relations between the project proponent and the affected community thus reducing the risk of hostilities and delays in the construction program, both before and after the contractor mobilizes to site.

The Grievance Redress Mechanism involves formation or operationalizing of Grievance Redress and Resettlement Committees. An effective mechanism to redress grievances requires:

- that grievances do not linger on and become contentious issues between project authorities and the affected community and result in opposition to the project;
- Project Affected Households (PAHs) and the overall community appreciate efforts by the project authorities to reach out to hear concerns, proactively address and resolve issues; and
- PAHs particularly demonstrate willingness to support and benefit from the implementation of proposed mitigation measures.

9.2 Objectives of GRM

The main objective is to provide a step-by-step process of registering and addressing grievances. It is expected that this mechanism will ensure redress of disputes through participative process. The specific objectives are:

- To create accessible, responsive and demonstrably fair channels to resolve communities' grievances and complaints in a mutually acceptable process.
- To implement effective dialogue and open lines of communication with the public.
- To create an extra channel for receiving information about community grievances and complaints surrounding the project.
- To serve as a release valve for community and worker grievances and complaints stemming from a project and provides early warning of potential problems that are developing.
- To prevent and address all forms of Gender Based Violence (GBV) and Sexual Harassment (SH) and Sexual Exploitation and Abuse (SEA) incidents that potentially happen at workplace and community level.

- To prevent unrealistic expectations or negative perceptions from the local population towards the Project.
- To prevent grievances and complaints from accumulating and escalating to conflicts such as protests, sabotage or strikes that can be very costly to a project in terms of its reputation and in terms of work time, land access or additional demands.
- To allow the project to understand the project risks associated with a grievance. Protests, campaigns and strikes can arise from 'unfounded' grievances or misunderstandings as well. The grievance mechanism provides one channel that a project proponent can use to rectify these sorts of misunderstandings or explain why a grievance is unfounded or is not within the project's jurisdiction.
- To improve the project social performance through the analysis of grievances and complaints.
- To maintain confidentiality for stakeholders who may need to raise comments/concerns anonymously.

9.3 Justification for Grievance Redress Mechanism

Grievance mechanisms are crucial to the success of any project as they play a crucial role in fostering transparency, accountability, and community involvement at all stages of the project. Throughout the project lifecycle, a well-functioning grievance mechanism serves as a vital tool for conflict resolution and prevention. In the planning phase, it provides an opportunity for stakeholders to express their concerns about potential impacts, facilitating the incorporation of community input into project design. During the implementation stage, the mechanism enables real-time responsiveness to emerging issues, allowing for swift corrective actions and adjustments. In the post-project phase, the grievance mechanism remains relevant for addressing any residual concerns, providing a structured process for the resolution of disputes and ensuring that the community continues to have a voice even after project completion.

9.4 Characteristics of the Proposed GRM

1. **Should be Accessible:** An accessible and functional grievance mechanism is important in addressing community or stakeholder concerns as well as receiving feedback on a project so that it can be improved. It is a requirement for all World Bank projects and the responsibility of all project staff, any of whom may receive the grievance.
2. **Should have multiple channels:** It is preferable that grievances are resolved in person at the lowest level, however different levels and channels of registering grievances should be available so that even the most marginalised person feels comfortable raising a grievance. GBV/SEAH related complaints should be referred immediately the GBV specialist.
3. **Confidentiality to avoid reprisal:** Grievances should be dealt with confidentially, on a need-to-know basis only, and without fear of backlash. Grievances can be submitted anonymously by any complainant, and personal data should be anonymised for all complainants who raise GBV issues.
4. **Open to receive any type of Grievance:** Grievances can be raised by community members, workers and other stakeholder concerning project implementation including: adverse social or environmental impacts, misuse of funds; staff behaviour, workers' conditions or safety, quality of service issues, sexual exploitation and abuse, forced or child labour etc.
5. **Timelines:** Grievances should be addressed within a reasonable time. Hence, grievances will be acknowledged within a week (7 days) of receipt and resolved, if possible, within 21 days including feedback to the complainant. The complaint will be addressed as fully and precisely as possible

9.4.1 Principles Guiding Grievance Redress Mechanism

- Acknowledge dissatisfaction: Accept that the displacement due to a development shall generate grievances, rather than ignore or turn away
- Effective listening: Careful listening to elicit information regarding the grievance shall help to accurately define the problem
- Separate facts from fiction: Ask for facts and record it (preferably by the PAH himself). If illiterate, provide support as necessary;
- Quick turn-around: Take optimum time to analyze, ascertain and decide and finally communicate the decision to the PAP. Keep communicating with PAHs in case of delays
- Follow-up: If decision requires a follow up action, take it soonest to instill confidence in the PAP regarding the grievance mechanisms and process
- Grievances will be recorded by using a Grievance Form in the local language and English. Grievance forms will be available for recording complaints and will contain details regarding the grievance as well as the name and address of the applicant, application date, type of application and the name of the persons receiving the grievance. The forms will be logged in a register where they will be tracked through to a suitable resolution. Grievances can be submitted orally (and will be recorded) or in written form.
- Devised keeping in mind the socio-cultural setting such as making use of village elders too in resolution of disputes;
- Take cognizance of impacts on female PAHs and ensures their adequate representation;
- Is independent of the implementing agencies to allow affected individuals to voice concerns and seek redressal;
- Is accessible and is well-supported by an effective information dissemination mechanism to prevent occurrence of a grievance in the first place due to lack of information;
- Is timely and responsive i.e. its recommendation and decisions are implemented by the project authorities; and
- Is transparent;
- Free of charge.

9.4.2 Grievance Procedure and Rationale

A grievance is any dissatisfaction or sense of injustice or unfairness felt by a person in this respect a PAP or his/her representative in connection with his/her compensation entitlements, RAP implementation process or other scenarios related to Project implementation. Grievance procedures may be invoked at any time, depending on the complaint and on the people involved. Grievances might be triggered due to the following reasons among others:

1. Misidentification of assets or mistakes in Valuation.
2. Dispute over the ownership of a given asset (more than one individual claiming one asset)
3. Disagreement over the valuation of the asset
4. Successions, divorces, and other family issues, resulting in disputes between heirs and other family members, over ownership or ownership shares for a given asset.
5. Grievances related to the titling process.

9.5 Grievance Redress Tiers

The ARAP provided a grievance redress mechanism in a 3-tier arrangement as indicated below:

I. The First Tier will allow for amicable review and settlement of the grievance at the settlement level with assistance of SEC members who will discuss and agree on amicable resolutions. This level is called the Settlement Grievance Redress Committee (SGRC).
II. The Second Tier will involve the Resettlement Implementation Committee (RIC) of KISIP in case the grievance cannot be solved at the first level.
III. The Third Tier will be the option of allowing the grieved party to seek redress at the court of law.

Levels I and II are costs free. The legal redress option, however, may incur some costs for the parties involved.

9.5.1 Grievance Redress Steps

The procedure of receiving and resolution of complaints is summarized in Table 23 below:

Table 20 - Grievance Redress Steps

Steps	Grievance Redress Steps Details
Step 1: Receipt of complaint/grievance	• A verbal or written complaint from a PAP or community member will be received by the Grievance Officer (GO) on behalf of the First Tier
Step 2: Determination of Corrective Action	• If in their judgment, the grievance can be solved at this stage, the GO and SGRC will determine a corrective action in consultation with the aggrieved person. A description of the action, the time frame within which the action is to take place, and the party charged with implementing the action will be recorded in the grievance register
Step 3: Meeting with the complainant	• The proposed corrective action and the time frame in which it is to be implemented will be discussed with the complainant within 14 days of receipt of the grievance. Acceptance of the agreement and corrective action will be documented
Step 4: Implementation of Corrective Action	• Agreed corrective actions will be undertaken by the party agreed by SGRC within the agreed time frame. The date of the completed action will be recorded in the grievance register.
Step 5: Verification of corrective action	• To verify satisfaction, the aggrieved person will be approached by the GO and SGRC to verify that the corrective action has been implemented. A signature of the complainant will be obtained and recorded in the grievance register

9.5.2 Grievance Redress Mechanism

The consultant has proposed a Settlement Grievance Redress Committee (GRC) as detailed through the Three-Tier Grievance Redress Mechanism GRM. **Figure 29** gives a presentation of the grievance redress mechanism.

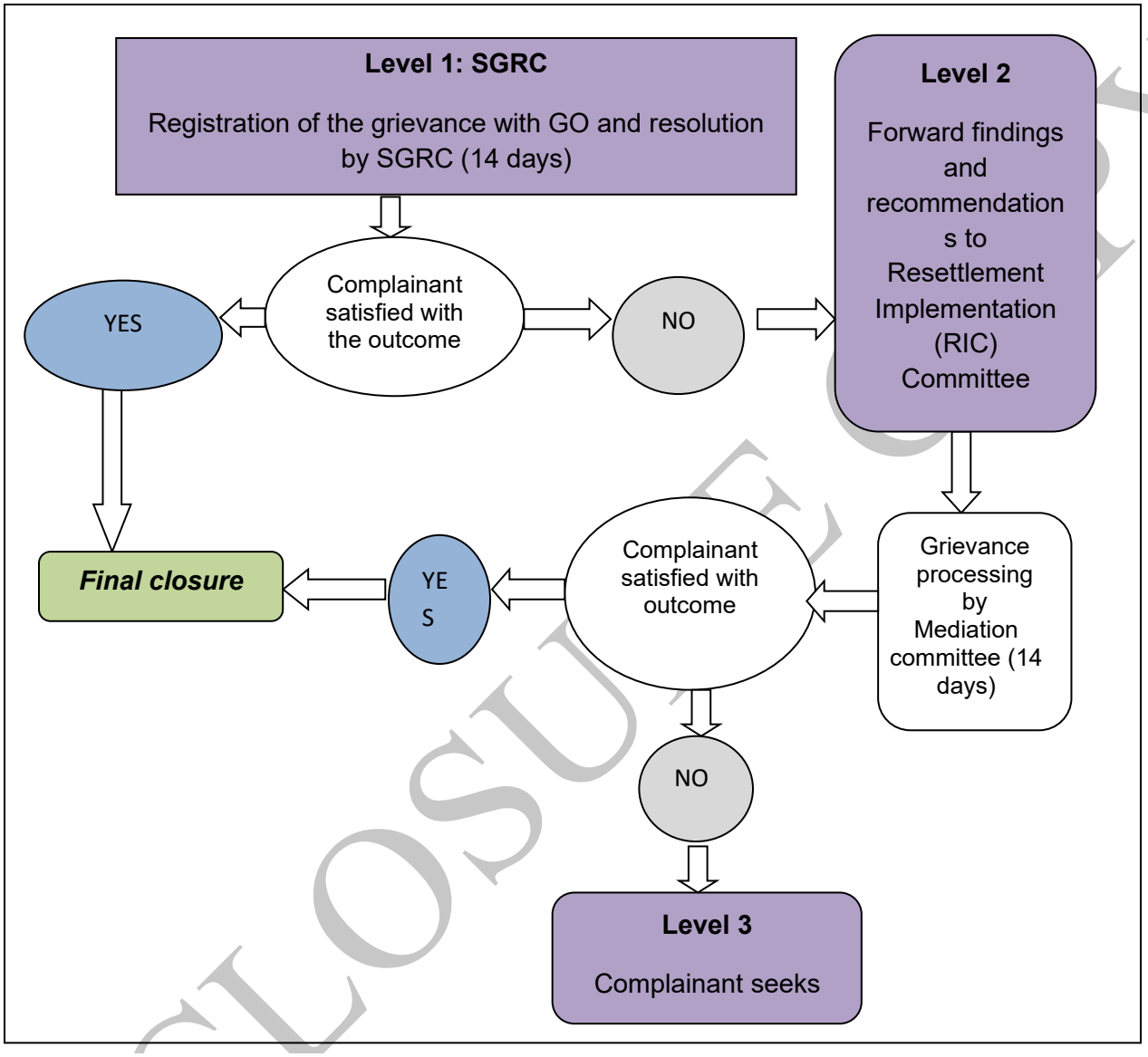


Figure 45 - Grievance Redress Procedure

CHAPTER 10: CONCLUSIONS AND RECOMMENDATIONS

This ESIA report drew the following conclusions and recommendations for this project:

10.1 Conclusion

The Huruma Settlement infrastructure upgrade project is a commendable initiative aimed at enhancing the well-being and livelihoods of the local community through the development of roads, drainage systems, water supply extension, and street lighting infrastructure. While the project holds positive intentions, it is crucial to acknowledge and address potential negative impacts such as resettlement and demolition, noise and air pollution, disruptions to daily activities, and the risk of flooding and social vices. The existing open sewer further adds to the challenges, necessitating a thorough assessment through an ESIA.

10.2 Recommendations

Stakeholder Engagement: Enhance stakeholder engagement throughout the ESIA process. Involve local communities, governmental bodies, and other relevant stakeholders in the decision-making process. Establish effective communication channels and a grievance redress Mechanism to address concerns and feedback.

Pollution Control Measures: Implement pollution control measures, including the use of low-emission construction equipment and dust control strategies. Prioritize the reduction of environmental pollution to create a healthier living environment for the settlement.

Employment Opportunities: Maximize the positive impact of the project by creating employment opportunities during the construction phase. Foster local development and economic activities to contribute to the overall improvement of the community.

Monitoring and Reporting: Establish a robust monitoring and reporting framework to track the implementation of the ESMP and ensure compliance with environmental and social standards.

Regularly communicate progress and findings to relevant stakeholders, fostering transparency and accountability.

i. By adhering to these recommendations, the project can strike a balance between achieving its positive outcomes and mitigating potential negative impacts, ultimately contributing to the sustainable development and improvement of the Huruma Settlement and its residents' quality of life.

10.3 Duties of the Proponent

It will be the duty of the proponent to ensure that all legal requirements as pertaining to the development are met as specified by the law, including World Bank Safeguards and specifically OP4.01 (Environmental Assessment).

- The proponent shall hand over the site to the Contractor for implementation of the project.
- The proponent will fund the project.
- The Proponent will acquire the NEMA license.
- The proponent will supervise the project and will also ensure its satisfactory implementation.
- The proponent shall ensure that there is a functional stakeholder engagement plan and grievance redress mechanism.
- The proponent shall define the area of the site, which will be occupied by the contractor for construction purposes.

10.4 Duties of the Contractor

- Prepare and maintain an approved time and progress work-chart, showing clearly the period allowed for each section of the work.
- The contractor is to comply with all regulations and by-laws of the local authority including serving of notices and paying of the fees.
- The contractor shall make good at his own expense any damage he may cause to the public and private roads, drainages and pavements in the course of carrying out the parking lot work.
- The contractor shall provide at his own risk, and cost all water required for use in connection with the works including the work of subcontractors, and shall provide temporary storage tanks , if required.
- The contractor shall make his own arrangements for sanitary conveniences for his workmen. Any arrangements so made shall be in conformity with the public health requirements for such facilities and the contractor shall be solely liable for any infringement of the requirements.
- The contractor shall be responsible for all the actions of the subcontractor in the first instance.
- The contractor shall take all possible precautions to prevent nuisance, inconvenience or injury to the neighbouring properties and to the public generally, and shall use proper precaution to ensure the safety of wheeled traffic and pedestrian.
- All work operations which may generate noise, dust, vibrations, or any other discomfort to the workers and/or guests of the client and the neighbours must be undertaken with care, with all necessary safety precautions taken.
- The contractor shall take all effort to muffle the noises from his tools, equipment and workmen to not more than 80dBA. This should also comply with the requirements of the WBG EHS Guidelines, whichever is the more stringent.
- The contractor shall upon completion of working, remove and clear away all plant, rubbish and unused materials and shall leave the whole site in a clean and tidy state to the satisfaction of the Proponent. He shall also remove from the site all rubbish and dirt as it is produced to maintain the tidiness of the premises and its immediate environs.
- No blasting shall be permitted without the prior approval of the proponent and the local authorities.
- Borrow pits will only be allowed to be opened up on receipt of permission from the proponent and with NEMA ESIA license.
- The contractor shall maintain good working relationship with the community and implement the stakeholder engagement plan and the grievance redress mechanism.
- The Contractor shall provide and engage a Safety Officer on site to manage occupational health and safety matters.
- The contractor shall also submit and commit to comply with an Environmental and Social Health and Safety (ESHS) Plan and a Code of Conduct regarding Contractor Environmental and Social Management Plan, CESMP.
- This section will be reviewed carefully against the contract documentation to ensure it is included in the contract documentation. As well, the contractor has to submit and have approved by the proponent the ESHS and the Code of Conduct.

REFERENCES

1. Kenya Population and Housing Census 2019, Kenya Bureau of Statistics
2. Kiambu County Integrated Development Plan (CIDP) for the F/Y 2023-2027
3. Kiambu County Integrated Development Plan 2018-2022
4. Republic of Kenya, 1999; Environmental Management and Coordination Act, 1999, Amended 2015
5. Republic of Kenya, National Population and Economic Census Report, 2019.

Annexes

Annex 1: Lead EIA Expert NEMA Licence

EAE 23061629

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/20603

Application Reference No: NEMA/EIA/EL/27380

M/S **PROF. JENESIO I. KINYAMARIO**
(individual or firm) of address
P.O. Box 17788 - 00100 NAIROBI

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
General
registration number **0134**

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

Issued Date: 1/25/2024 Expiry Date: **12/31/2024**

Signature.....

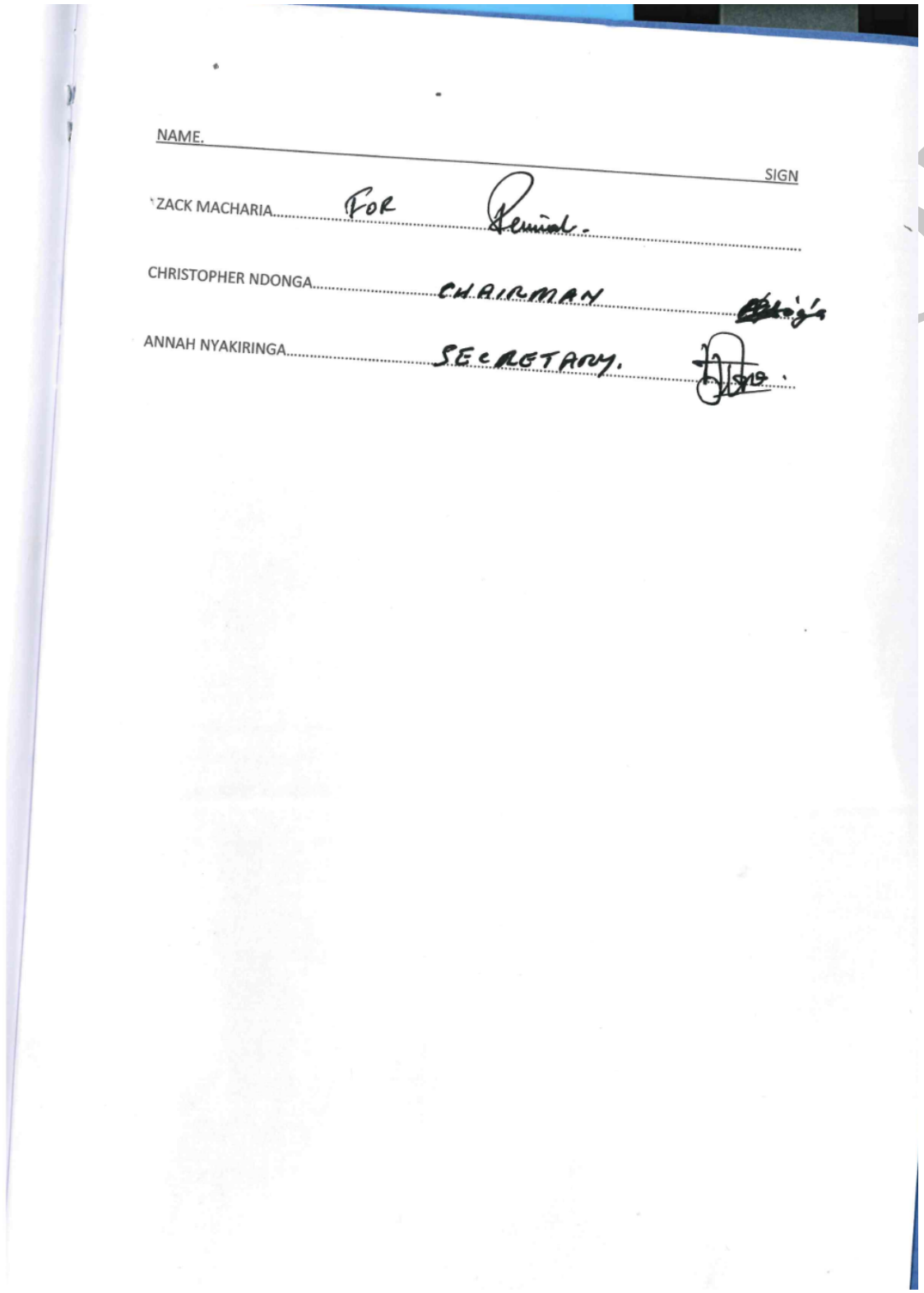
(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001 : 2015 Certified

Annex 2: Public Participation Records

Participants in a meeting held on Nov. 9, 2023



NAME. SIGN

ZACK MACHARIA ..... FOR ..... Remah.

CHRISTOPHER NDONGA ..... CHAIRMAN .....

ANNAH NYAKIRINGA ..... SECRETARY. 8/19

Annex 2: Abbreviated Resettlement Action Plan (ARAP)

10 A-RAP- MISRI INFORMAL SETTLEMENT

10.1 ACTUAL CENSUS SURVEY OF PAPS AND VALUATION OF AFFECTED ASSETS

10.1.1 Introduction

A key early task in resettlement planning is the identification of Project's adverse impacts on those that will be affected. The ultimate goal of a ARAP is to enable those affected by a Project to improve their standard of living; a goal that requires an examination of social, environmental and economic conditions. This chapter provides an assessment of the potential socio-economic impacts that the Project will have on those affected. Knowledge of these likely impacts enables appropriately targeted compensation and livelihood restoration plans to be formulated, to support affected people to re-establish their structures and means of livelihood.

The chapter draws on:

- The socio-economic surveys and subsequent baseline produced for the project.
- The affected asset valuation work, that has been conducted to inform the entitlement requirements and compensation parameters of each eligible group and
- Stakeholder engagement activities that have been undertaken with affected PAPs regarding the effects of the project and development opportunities.

The assessment of impacts takes into account the assets being impacted; the number of PAPs affected, the extent of their vulnerability; and their ability to replace lost assets or the livelihood generated from them.

The proposed projects will in some instances result to negative impacts on Project Affected Persons (PAPs) whose livelihood and properties will be interrupted. Therefore, the impact will be both physical and economic displacement of the Project Affected PAPs.

The different types of losses that will be experienced by PAPs will be loss of structures.

10.1.2 Resettlement Impacts

Impacts

Detailed category of impacts in numbers is presented in **Table 21** below.

Table 21 - Summary of Resettlement Impacts by wards

Type of Loss	Total
PAPs losing structures	7

Impacts on PAPs with Structures

The Project will impact 7 **PAPs** whose structures will be affected. These structures are made of different materials including iron sheet and others wooden materials. **Table 22** presents a summary.

Table 22 - Summary of the impacts on structures

Affected structure	Number
Business structure (kiosks)	4
Fence	2
Varanda	1

Mitigation Measures

- Cash compensation for loss of structures (calculated at replacement cost).
- Or In-kind compensation through replacement of the structure
- Right to salvage.

10.1.3 Number and Nature of Affected Business

Table 6.3 below provides a summary of nature of businesses affected in the Settlement:

Table 0.23:: Nature of Business Affected

Nature of Affected business	Number of Affected Business
Butchery	1
Vegetable kiosks	3

Total number of Vulnerable PAPs

No PAP was considered vulnerable in the entire Misri settlement.

10.1.4 Mitigation of Negative Impacts

Table 6.4 below provides mitigation measures adopted by this ARAP for the negative impacts identified:

Table 24 - Mitigation of Impacts

Impact	Mitigation
Loss of Structures	Loss of Structures will be replaced at full replacement cost; the owners will also be given three months' notice to remove the affected asset and the right to salvage materials.
Loss of Business Income/Rental income	Affected businesses will be given total replacement Value (CMV + 15% Disturbance Allowance + 15% Cost of Relocation).

10.1.5 Valuation Methods

Valuation of Structures

To establish the replacement cost, the coordinates, type of structure, construction details, built up areas, and occupancy status of the different structures were recorded during the data collection phase. This was aimed at establishing the replacement cost of the different structures for compensation purposes. As a result, the structures have been valued based on the 'reproduction cost' i.e., the cost of reconstructing an identical structure by using the same materials and design at the time of appraisal without depreciation.

10.2 COMPENSATION MEASURES AGREED WITH THE PAPS AND OTHER RESETTLEMENT ASSISTANCE TO BE PROVIDED.

10.2.1 Eligibility for Compensation

The proposed project will lead to economic displacement by affecting PAPs' business structures. The affected persons, irrespective of their tenure status, are eligible for assistance if their assets will be affected by infrastructure development or engaged in any livelihood income-generating activity in the settlement.

10.2.2 Cut-Off-Date

The cut-off date for the project was declared to be **30th November 2023** which was disclosed through the SEC. Those who encroach on the area after the established cut-off date will not be eligible for compensation or assistance. Updates of project information will be made regularly based on information provided by the SEC.

10.2.3 Principles Guiding Compensation

The entitlement matrix defines the type of compensation and assistance to be provided to the different categories of Project Affected Persons. The following principles will guide payment of compensation for lost assets

- Compensation shall be paid prior to displacement.
- Compensation shall be extended to all PAPs irrespective of tenure status.
- Compensation will be at replacement cost meaning that replacement of assets with an amount sufficient to cover full cost of lost assets and related transaction costs.
- Compensation for structures shall include the full cost of materials and labor required for reconstructing a building of similar surface and standing. In other words, the affected person must be able to have their structure rebuilt in a different location using the compensation paid for the old building. Depreciation will not be taken into account while calculating the cost of affected structures.

10.2.4 Vulnerable Groups

Vulnerable PAPs are a distinct group of people who might suffer disproportionately or face the risk of being marginalized as a result of resettlement and specifically include: (i) female- and child-headed households, (ii) disabled household heads, (iv) Households headed by elderly persons with no means of support.
This ARAP assessment further analyzed vulnerability using several indicators which included:

- Gender dimension with regard to ensuring equal right to knowledge and decisions on ARAP process and management of compensation funds eligible to a household.
- This ARAP provides that PAPs will open joint account with their spouses in order to ensure collective management of compensation funds.
- The rights of dependents especially children to be involved in the ARAP process and management of compensation funds eligible to a household.
  There was NO vulnerable PAP in Misri Informal Settlement.

10.2.5 Entitlement Matrix

The entitlement matrix is designed to ensure all eligible PAPs are compensated appropriately depending on the loss incurred. All persons affected by the Project and meeting the cut-off date requirements will be entitled to a combination of facilitation packages and resettlement assistance depending on the nature of ownership rights on lost assets and scope of the impacts. The entitlement matrix developed for this assessment is presented in **Table 25.**

Table 25 - Entitlement Matrix

Type of Loss/Impact:	Category of Affected Person	Proposed Entitlements / Mitigation – Resettlement, Compensation and Assistance
Dwellings used for secondary purposes (rental houses, free accommodation for relatives, etc.)	Owner of residential structure	• Cash compensation for all structures at replacement cost, based on professional valuation. • Statutory Disturbance Allowance of 15% of compensation amount. • Materials from the affected structure may be salvaged at the owner's expense within the notice period to vacate defined by the project schedule and prior to demolition.
Fully affected/Partly affected remaining structures not viable	Squatter	• Cash compensation at replacement cost for the structure. • One time shifting allowance of Ksh 10,000. • Right to salvage materials.

Type of Loss/Impact:	Category of Affected Person	Proposed Entitlements / Mitigation – Resettlement, Compensation and Assistance
	Tenant	• Housing allowance for two months equivalent rental value • A one-time shifting allowance of Ksh 5,000.
Part affected structures with remaining portion viable	Squatter	• Cash compensation of affected area at replacement Cost without depreciation. • Repair Cost at 25% of the total compensation. • Right to salvage materials.
Loss of Income	Business operators Loss of Rental income	• Cash compensation based on a calculated average loss of income over an appropriate period • Subsistence allowance equivalent to 2 months rental income.
Sanitation facilities (Pit latrines & bath shelters).	Owners of buildings (residential)	• Cash compensation for all structures at replacement cost, based on professional valuation. • Statutory Disturbance Allowance of 15% of compensation amount. • Materials from the affected structure may be salvaged at the owner's expense within the notice period to vacate defined by the project schedule and prior to demolition.
Moveable and other structures such as fences, business	Owner of structures	• Cash compensation for all structures at replacement cost, based on professional valuation. • Statutory Disturbance Allowance of

Type of Loss/Impact:	Category of Affected Person	Proposed Entitlements / Mitigation – Resettlement, Compensation and Assistance
kiosks, livestock enclosures, livestock water points, etc.		15% of compensation amount. • Materials may be salvaged at the owner's expense within the notice period to vacate defined by the project schedule and prior to demolition.

10.3 STAKEHOLDER CONSULTATION AND PARTICIPATION

10.3.1 Objectives of Stakeholder Consultations

The aim of Stakeholder Consultation and Public Participation is to disseminate information to interested and affected parties, solicit their views and consult on sensitive issues. The specific aims of the Public Consultation and participation process during preparation of the ARAP include:

- To inform the residents, local administration and other stakeholders about the proposed projects and its objectives
- Obtain the main concerns and perception of the community and their representatives about the project.
- To promote project ownership by the proponent and beneficiaries in order to minimize conflicts.
- Receive comments and suggestions from the directly affected persons on the project impacts and best suited measures to mitigate them.
- To facilitate the development of appropriate and acceptable entitlements options
- To increase long term project sustainability and ownership
- To help in institutional coordination, especially at the different government levels.

10.3.2 Stakeholder Inventory

During the public consultations, multiple groups of stakeholders were consulted. The stakeholders were those who have an interest in the project development, and who will be involved in the further consultative process. The main groups of stakeholders consulted were:

i. Project Affected Persons

These are the people who reside in the settlement or derive their livelihood from the settlement. These people will partially or fully lose their structures or lose shelter due to the infrastructure development activities in Misri Informal Settlement.

ii. Government Agencies consulted These included the following:

- KISIP
- Area chiefs
- County Government of Kiambu
- Ministry Of Lands, Housing And Urban Development

10.3.3 Stakeholder Consultations Held

The initial public consultations and sensitization were done on 8th November 2023. They involved county government administration, community leaders and community groups in Umoja informal settlement, Provincial Administration through the assistant chief and the SEC. These consultations provided views, opinions and suggestions on the proposed projects including feeder roads, sewer line, completion of social hall, erection of high mast security light and water supply in the informal settlement. Further, the consultations provided views (comments, suggestions, fears and concerns) on the proposed projects in these settlements. Detailed public consultations involved conducting public meetings and key informants' discussions with the target beneficiaries and other stakeholders. The meetings were facilitated by the SEC.

Sample photos of the consultative forums

10.3.4 Impacts of the Proposed Project During Construction and Operation.

Positive Impacts

- Increased land value in the settlement
- Improved road network and drainage system.
- Improved security because of the installation of high mast security lights (mulika mwizi)
- Attraction of investors due to better infrastructure and improved security
- Employment creation during the project implementation
- Increased business due to long operation hours due to improved security
- Improved sewerage will reduce water borne diseases
- Construction of dispensary will improve the health status of the community

Negative impacts
- Disruption of businesses during the construction
- Dust pollution during the construction
- Influx of people as infrastructure will attract people from other areas into the settlement
- Increased HIV infections as human influx is likely going to attract sex workers during and after construction
- Disposal of waste materials during the construction period

10.3.5 Conclusion

Generally, there is an overall appreciation for the proposed projects having emanated from the community members within the Misri informal settlement. However, the community emphasizes the need to be involved in the overall project. SEC is the entry point into the community hence the Contractor should ensure that members are involved at all stages of the project. In so doing, this will go a long way in ensuring the smooth implementation of the project.

10.4 INSTITUTIONAL ARRANGEMENT AND IMPLEMENTATION

10.4.1 RAP Implementation Procedures and Process

Implementation of this RAP will include several Institutions with and without statutory mandate. This Chapter describes the different Institutions that will be involved in the implementation of the ARAP including their roles and responsibilities. Implementing this ARAP involves several key procedures and processes:

10.4.2 Validation

Validation of the asset and PAP register will be undertaken by the KISIP project coordination team to ensure its correctness.

10.4.3 Disclosure Process for the RAP

Public disclosure of the RAP will be made to PAPs and other stakeholders for review as well as monitoring of the implementation. Disclosure will be in the form of:

- Public disclosure meeting organized in the target locations. As a requirement this ARAP will be disclosed in a form, manner and language comprehensible to PAPs and at a place accessible to PAPs and other stakeholders e.g., Location Chiefs Offices.
- A half day workshop will therefore be conducted in the target estates by the consultant with the PAPs, stakeholders, local leaders with the objective of disclosing the ARAP. During this disclosure meeting, a summary of the main findings and recommendations, entitlements, and PAP register will be presented. Once disclosed, the PAPs will be notified about the availability of the ARAP document.
- The ARAP will be posted on the ministry website.

10.4.4 Capacity Building

Implementation of the ARAP will entail capacity building and orientation of the officers in charge of its implementation as well as the GRM institutions described in previous Chapter.

Therefore, it is planned that training and orientation on the ARAP implementation will be organized after the final approvals of the document as detailed in the implementation schedule.

10.4.5 Sensitization

This will cover a number of issues including appropriate use of compensation funds and avoidance of gender-based violence related to compensation funds.

10.4.6 Resettlement Implementation Institutions

This ARAP will be implemented within a period of not more than 60 days upon approval from the World Bank. At implementation phase, KISIP will ensure all PAPs are adequately facilitated according to the provisions of this ARAP before the project commences. The implementation tasks will be carried out by KISIP Resettlement Implementation Committee (RIC) for Kiambu County whose composition is outlined in this ARAP.

(i) The National Treasury

The treasury has a role of managing finances on behalf of the borrower. The government, through the treasury will avail resources for the project including funding allocated for RAP implementation.

(ii) Ministry of Lands, Public Works, Housing and Urban Development. ((State Department for Housing and Urban Development)

It houses the KISIP project and provides for policy direction.
The Ministry has the role implementation of infrastructure improvement in the planned Settlements and this ARAP

(iii) Ministry of interior

The ministry through the County Commissioner's office will mobilise the PAPs and guide in the process of their verification.
The ministry will get involved during the process of sensitisation
The Grievance Redress Mechanism consist of the County Commissioners' Representative (Chief) and will support the project in dispute resolution

10.4.7 ARAP implementation at KISIP

(a) KISIP Project Coordination Team

The overall coordination of the whole process is provided by the KISIP Project Coordinating Team (PCT). The National KISIP Coordinating Unit has the following roles:

a. Coordinate the effective implementation of the ARAP as provided for by the RPF.
b. Prepare Progress Reports on the implementation of the Social Safeguards.
c. Procure and supervise consultants for Social safeguards.
d. Build the capacity at all levels to implement the RAP.

e. Supervise RAP implementation during and after project implementation.
f. Ensure integration of RAPs into Contract and Bid Documents.
g. Ensure adequate community participation.

(b) KISIP RAP Implementing Committee

Resettlement Implementations Committee, appointed by the Project Coordinator has been incorporated in the GRM and has the overall responsibility of Monitoring and Evaluation of the resettlement process. The following are the recommended members:

From KISIP National PCT

a. Head of Component 1.
b. Social Safeguard Specialist.
c. Community Development Specialist.
d. 3 members from Component 2 – Surveyor, Land Administrator and Valuer.
e. KISIP Finance Officer.

From the County

a. County KISIP Coordinator who will be the chairman.
b. Assistant County Commissioner.
c. Community Development Officer.
d. County Surveyor.
e. A representative from enforcement department.
f. Town Administrator.

The committee works with the Project Affected Persons for each settlement.

The committee's roles are as presented below.

a. The Resettlement Implementation Committee shall ensure the list of all PAPs has been verified and documented in the PAP register. The register shall have, among other parameters, (1) the name of the person, (2) type of loss (structure / Livelihood) (3) identification number of the PAP, (3) Compensation Amount (3) Bank Details or M-pesa details of the PAP.
b. The Resettlement Implementation Committee will verify the identity of each PAP as stated in the register and ascertain that every identity card holder is correctly documented in the register.
c. Resettlement Implementation Committee and SEC will carry out sensitization about opening of joint accounts and appropriate use of compensation funds for households. RIC will support PAPs in opening individual and joint accounts with financial institutions of their choice. RIC will follow up on PAPs to ensure they have received their compensation.
d. On completion of the PAP Audit and resolution of any grievance, the committee shall recommend compensation. Payments will be made according to locations and adequate information will be made available to all affected persons prior to payment. Such information will include: dates and locations of payment, list of eligible people and mode of payment, etc.

(c) County KISIP teams

For effective implementation of the project, Counties have established County KISIP Teams whose composition is a replica of the national team. The county team was crucial in

development of this ARAP and they will also be important during implementation of the ARAP prior to commencement of civil works.

The role of the County KISIP Team includes:

i. Validation of assets and PAPs before compensation.
ii. Formation of the Grievance Redress Committee.
iii. Capacity building of ARAPs committee.
iv. Sensitization of PAPs on bank accounts and use of compensation funds.
v. Gender based violence sensitizations in use of compensation funds.
vi. Monitoring of ARAP activities.
vii. Oversight and supervision of rebuilding of structures owned by vulnerable PAPs who need assistance.

(d) Kiambu County Government

The county's role includes:

i. Facilitate implementation of ARAP and ensuring project success.
ii. Delivery of other assistance to PAPs will be the responsibility of County Government under the coordination of respective RIC.
iii. Responsibility for appropriate and suitable measures to prevent further encroachments after the cut-off date and before facilitation is made.
iv. Oversight and quality control of rebuilding of structures for vulnerable PAPs identified for this additional assistance.
v. Clearance of structures after expiry of self-demolition period and compensation.
vi. Part of Grievance Redresses Mechanism through County KISIP office.
vii. Maintaining infrastructure and safeguarding them from encroachment after ARAP Implementation.

(e) Settlement Executive Committee

This was instrumental in mobilizing the community and providing a link between KISIP and the community. The Committee has been involved in all stages of ARAP development and is expected to continue playing an active role in monitoring its implementation.
The Settlement Executive Committee role in the ARAP process as follows:

i. It provides an entry point into the informal settlement.
ii. It is the crucial link between the community and other institutions.
iii. Plays an important role in the formulation of the community resettlement committee and other engagement structures.

10.5 IMPLEMENTATION TIMETABLE AND BUDGET FOR THE ARAP IMPLEMENTATION

10.5.1 Gender Empowerment Activities

Gender mainstreaming is one of the guiding principles of this ARAP and women rights are important in this ARAP, to enhance these rights, initiatives tailored to sensitize women on tenure rights, Land Laws and enhancing land related decision making for women within the settlement was done.

In implementing these initiatives, key stakeholders including KISIP and Kiambu County; Gender Department; local women and men-based organizations; SEC; and local community

will participate in the sensitization exercise. These Sensitization exercises during implementation of this ARAP will include but not limited to:

i. Enhancing women's economic empowerment rights and making sure the female headed households are not disenfranchised during compensation;
ii. Sensitizations on sexual and gender-based violence in use on Compensation Funds.

10.5.2 RAP Implementation Schedule

The implementation schedule for this ARAP covers the period from the preparation of the ARAP to the conclusion of the envisaged projects in Misri Informal Settlement. As part of ARAP implementation, disclosure of RAP will be a critical task, disclosure will be achieved through meetings organized at settlement level coordinated by the KISIP Resettlement Implementation Committee.

In the disclosure meeting, a summary of the main findings and recommendations, entitlements and PAPs register will be presented to the community with interpretation in the local language if required. The process of RAP implementation will also involve other tasks as summarized below.

- Audit of PAP register and compensation package due to each PAP.
- Resolution of emerging grievances
- Notification and sensitization of PAPs.
- Commencement of Project operations
- Monitoring and evaluation, including baseline information update.

Table 26 - ARAP Implementation Schedule

S/No.	Activity	Period (Month)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Task 1	**ARAP PREPARATION**															
1.1	RAP Preparation and Submission of Draft ARAP to KISIP															
1.2	Finalisation of RAP															
Task 2	**RAP DISCLOSURE**															
2.1	Sensitization of the PAPs on the project															
2.2	Capacity building of GRM committees															
2.3	Distribution of ARAP summaries to local administration offices															
2.4	Holding ARAP disclosure meetings															
Task 3	**VALIDATION OF PAPS**															
3.1	Dispute resolutions by GRCs															
3.2	Sensitization of PAPs on bank accounts and financial management															
3.3	Sorting out PAPs challenges such as missing IDs, account details															
3.4	Putting together the required machinery, legal and educational processes, and training of resettlement staff															
4	**PAYMEMNT OF COMPENSATION**															
4.1	Issuance of 30 days notice of self demolition															
4.2	Self demolition within the 30 days notice															
4.2	Demolition of any structure that have not been demolished															
5	MONITORING ACTIVITIES															
5.1	Monitoring and evaluation of resettlement of PAPS especially vulnerable groups			◆	◆	◆	◆	◆		◆	◆◆	◆		◆	◆	◆

- This schedule is subject to amendment subject to the final activities to be determined at the commencement of the projects.

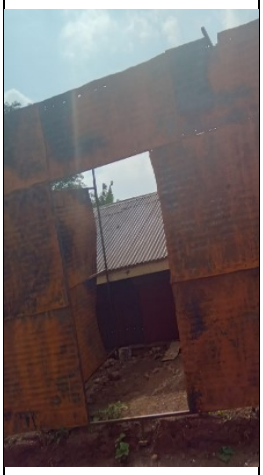
10.5.3 Itemized Budget

This section contains a summary of the costs as shown in **Table 27** for implementing the Resettlement Action Plan and a high-level Implementation Schedule. Critically, it also lists the assumptions that underpin both the cost estimate and the schedule. See details in **Appendix 3** of this Report.

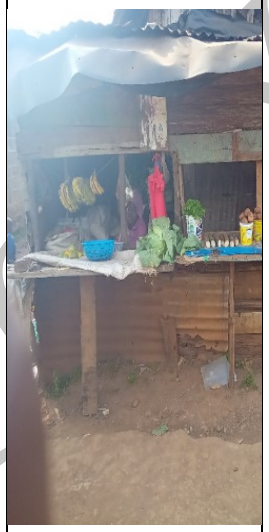
Table 27 - RAP Budget

Description	Details	Amount (Ksh)
Structures	6 structures	205,400.00
Sub Total 1		205,400.00
Facilitation of Grievance Redress and Resettlement Committees (5%)		10,270.00
Monitoring and Evaluation 5%		10,270.00
Contingency Costs (15%) to deal with unforeseen costs.		30,810.00
Sub Total 2		51,350.00
Grand Total		**256,750.00**

Table 28 - PAP Register

Special number/index	Name of the HH Owner	ID	Telephone	Gender	Plot Number	Ownership/ Rented	Coordinates	Age	Photo
1	John Njoroge/Kirathimo Butchery	232569	101574567	Male	1	owner	-1.112256, 36.645855	55	
2	Sarah Ng'endo Mwangi	11309765	0725789517	Female	78	owner	-1.114494, 36.645813	50	

3	Nduta Grace	25256690	0708334455	Female	228	owner	-1.115243, 36.645913	40	
4	Mary Wanjuru	24561440	0714570499	Female	456	owner	-1.115928, 36.64537	30	
5	Felisters Mwongeli	28161389	0707800713	Female	323	owner	-1.117295, 36.645084	50	

									
6	Joyce Wanjiku	562344	0703223364	Female	456	owner	-1.118, 36.644755	54	

7	Cyrus Njonge	2323564	0705696932	Male	234	owner	-1.118078, 36.645427	63