GOVERNMENT OF THE REPUBLIC OF KENYA

MINISTRY OF TRANSPORT, HOUSING AND URBAN DEVELOPMENT
State Department of Housing and Urban Development

SECOND KENYA INFORMAL SETTLEMENT IMPROVEMENT PROJECT (KISIP 2)
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CONSULTANCY SERVICES FOR RESETTLEMENT ACTION PLAN (RAP) AND ENVIRONMENTAL AND SOCIAL IMPACT ASSESSEMENT (ESIA) REPORTS AND SUPERVISION OF CONSTRUCTION WORKS IN SELECTED INFORMAL SETTLEMENTS (UPPER KARIOKOR) IN TAITA TAVETA COUNTY

COMPREHENSIVE PROJECT REPORT FOR UPPER KARIOKOR SETTLEMENT

VOI TOWN, TAITA TAVETA COUNTY

DATE: JULY 2024

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DECLARATION

Certificate of Declaration and Document Authentication

This document has been prepared in accordance with the Environmental (Impact Assessment and Audit) Regulations, 2003 of the Kenya Gazette Supplement No.56 of13thJune 2003, Legal Notice No. 101.

This report is prepared for and on behalf of:

The Proponent

The County Government of Taita Taveta, Ministry of Lands, Public Works, Housing and Urban Development, State Department of Housing and Urban Development.

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Designation ----------

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Lead Expert

I, **Charles Muyembe Lwanga, Lead Expert, License Number 6417** submit this Environmental and Social Impact Assessment (ESIA) Study of the 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 Marginalised groups plan (VMGP), where applicable, and supervision of construction works in selected informal settlements for Upper Kariokor settlement Upgrade Project.

Signed at …… on this …… day of **July 2024**

Signature: ……

Designation: ESIA/AUDIT LEAD EXPERT REG. NO **1283**

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LIST OF ACRONYMS

ARAP	Abbreviated Resettlement Action Plan
AFDB	African Development Bank
AFD	Agence Francaise Developement
BoQ	Bill of Quantities
EHS	Environment Health and Safety
EA	Environmental Assessment
ESAAP	Environment and Social Audit Action Plan
ESIA	Environmental and Social Impact Assessment
ESMMP	Environment and Social Management & Monitoring Plan
EMCA	Environmental Management and Coordination Act
GoK	Government of Kenya
HSP	Health and Safety Plan
MTIH&UD	Ministry of Transport, Infrastructure Housing and Urban Development
MTP	Medium Term Plan
MDG	Millennium Development Goal
MSF	Sustainable Development Goals
NEC	National Environment Council
NEP	National Environment Policy
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
PCR	Physical Cultural Resources
PCT	Project Committee Team
PRSP	Poverty Reduction Strategy Paper
RAP	Resettlement Action Plan
OP	Operation Policy
OSHA	Occupational Health and Safety
SDH&UD	State Department of Housing and Urban Development
SDG	Sustainable Development Goals
SUP	Socially Uplifting Project
WBG	World Bank Group

EXECUTIVE SUMMARY

Introduction

The Government of Kenya with support from the World Bank and Agence Francaise Developement (AFD) is implementing the Kenya Informal Settlements Improvements Project II (KISIP 2) to consolidate the gains made under KISIP I and enhance the benefits of the project to more people in informal settlements. This Second phase of the Kenya Informal Settlements Project (KISIP 2) will build on the successes and lessons learned from KISIP I, but also introduce new interventions to deepen its overall impact. It will support the interventions that have been successful under KISIP I, namely: tenure regularization, infrastructure upgrading, and institutional strengthening. Unlike KISIP I, however, the proposed project will include new approaches and new activities to strengthen its impact on the participating communities.

Second Kenya Informal Settlement Improvement Project (KISIP 2) follows the lessons learnt from the success of KISIP I.

The ESIA was conducting in line with the guidelines of both World Bank operating policy and the Environmental Management and Coordination Act 2015 Environmental EIA regulations of 2019.

Project objective

Upper kariokor settlement is characterized by poorly planned infrastructures that is struggling to accommodate its rapidly growing population that's evidenced by its location as a divisional headquarters.

The Objective of the proposed project in upper kariokor informal settlement is multifaceted, focusing on enhancing access to basic services by improving roads, storm water drainage, and lighting to facilitate better access to healthcare, education, and other essential services. It also aims to strengthen tenure security through infrastructure upgrades that mitigate flooding and environmental hazards, thereby increasing settlement safety and stability. The development plan is closely aligned with community needs, determined through consultation, ensuring that the projects are tailored to address local priorities. Additional support is provided for planning, surveying, and issuing land documents, enhancing legal recognition and security. The strategy underscores the importance of community-driven development, involving residents in decision-making to promote ownership and sustainability. It also aims to strengthen the institutional capacity of county administrations to efficiently manage and implement slum upgrading projects, empowering them to better meet development objectives.

Objectives of the Comprehensive Project Report.

- The CPR like any other Environmental & Social Impact Assessment (ESIA) is expected to achieve the following objectives:
- To identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- To assess and predict the potential impacts during site preparation, construction, operational and decommissioning stages of the Project.
- To verify compliance with environmental regulations.
- To generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the Project cycle.
- To allow for public participation.
- To prepare an Environmental and Social Management Plan to mitigate the identified impacts so as to ensure sustainability of the proposed Projects.
- To recommend cost effective measures to be implemented to mitigate against the negative impacts.

ESIA Approach and Methodology

Environmental and Social Screening; This step was conducted through legal review and desktop studies to assess whether there will be a need for an environmental and social impact assessment, and what level of assessment is necessary. This was done using a screening checklist in reference to requirements of the EMCA, 1999, and specifically the second schedule. The proposed projects are listed as medium risk projects in Legal Notice 31&32 of EMCA and under the World Banks framework, as Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures.

The project screening report indicating the Environmental and Social Management Framework checklist as well as the Resettlement Policy Framework checklist have been annexed in the report below.

Environmental and Social Scoping; The scoping process, through an ESIA scoping checklist, was conducted to help narrow down onto the most critical issues requiring attention during the assessment. Environmental issues were categorized into physical, natural/ecological and social, economic and cultural aspects. It also included discussions with key stakeholders, managers and design engineers as well as interviews with local communities. Data from secondary sources was used to outline the bio-physical features, socio-economic characteristics of the residents, the existing infrastructure services and the forms of land tenure.

Desktop Study; Desktop study included document review on the nature of the proposed activities, project documents, designs, policy and legislative framework as well as the environmental setting of the area among others.

Site Assessment; Field visits were made for physical inspections of the areas around the project site and the environmental status of the surrounding areas to determine the anticipated impacts.

Public Participation; Public participation meetings were conducted specifically the project area. Random surveys and Focused Group Discussions (FGDs) were conducted in the smaller groups of residents located along the road corridor. To ensure adequate public participation in the ESIA process, questionnaires were administered to the local communities, and the information gathered was subsequently synthesized and incorporated into the ESIA Comprehensive Project Report (CPR). Additionally, the consultant incorporated the concerns and views of all stakeholders and the affected people.

General questionnaires; Questionnaires were structured to gather data from respondents on various subjects. Typically, they began with an introduction outlining the purpose; followed by sections for demographic information such as age, gender, education, and occupation. The main body of the questionnaire comprises clear and specific questions, including both closed-ended (multiple-choice, yes/no) and open-ended formats, organized logically to address the primary objectives. Additional sections allow for detailed feedback or exploration of specific topics. Before deployment, questionnaires undergo review and pilot testing to ensure clarity, relevance, and accuracy.

Key informants' interviews; Following this, background information is gathered from the informant, including details about their expertise or experience. The main body of the interview consists of focused questions designed to elicit detailed insights or perspectives on specific aspects of the topic, with the interviewer probing further and seeking clarification where necessary. Towards the end of the interview, the interviewer may summarize key points discussed, inviting the informant to reflect on additional insights. The interview concludes with gratitude for participation and a reminder of any follow-up steps. Subsequently, the conversation is transcribed and analyzed to extract relevant themes and insights. Key informant interviews served as invaluable tools for obtaining rich qualitative data, offering nuanced perspectives that complement quantitative research methods. Some of the key informants came from members of the youth, people with disabilities, women, public facility institutions and religious leaders

Socio-economic surveys; Socioeconomic surveys are comprehensive data collection efforts aimed at understanding the social and economic characteristics of a population or specific groups within it. These surveys began with the careful selection of a representative sample using various sampling techniques to ensure

accuracy and reliability. A structured questionnaire is then developed to gather information on demographics, income, education, employment, housing, health, and access to services. Trained surveyors administered the questionnaire through face-to-face interviews, adhering to standardized protocols to maintain data quality.

Interactive meetings; These meetings were characterized by active engagement, with participants encouraged to contribute their insights, ask questions, and provide feedback. Through interactive tools such as brainstorming sessions, group discussions, and breakout activities, attendees had the opportunity to explore topics in depth, share diverse perspectives, and generate innovative solutions. Facilitators/consultants played a crucial role in guiding the discussions, ensuring that all voices are heard, and maintaining a constructive and inclusive environment. By fostering meaningful interaction and collaboration, interactive meetings led a better decision-making, and largely informed the consultants on proposed projects.

Data Analysis, Reporting and Documentation; Data was quantitatively and qualitatively analyzed in terms of themes. The Environmental Social Impact Assessment Study Report was compiled from the findings in accordance with the guidelines issued by NEMA for such works and prepared and submitted by the proponent for consideration and approval. The Consultant ensured constant briefing of the client during the exercise.

Project Location

Taita Taveta County is located in the Coastal Region of Kenya and is one of the six coastal counties of the Republic of Kenya. The County borders Tana River, Kitui and Makueni counties to the North, Kwale and Kilifi counties to the East, Kajiado to the North-west, and the Republic of Tanzania to the South and South-west. It ranges in altitude from 500m above sea level to 2,300m at Vuria peak, which is the county's highest point. The land area of the County is 17,084 square kilometers, of which 11,000 Km^2 is occupied by two National parks; Tsavo East and Tsavo West.
Upper Kariakor is a village located in the outskirts of Voi town. Administratively, it can be found in Mbololo ward, Voi sub county. It lies in the lowlands of Taita Taveta County and is close to African Wildlife Foundation, Tsavo and the sub county offices. The settlement is a part of Kariako settlement together with Lower and Central Kariako. The three are considered to be the oldest residential areas of Voi Town. The settlement is accessed through the Desert Rose hotel turn in off the Kaloleni -Kariakor road. The settlement coordinates are 3°23'18"S 38°33'25"E

Project Description

Roads, Footpaths, and Drainage System: The road infrastructure development involves the upgrade of existing marram roads to bitumen standards, covering a total length of 1186.6 meters. The roads are designated with specific numbers and names, each varying in length and width. The carriage way is designed with varied widths between 3.0m to 4m, depending on the alignment. The pavement structure is meticulously planned, comprising a 300mm thick improved subgrade compacted in two layers of 150mm to 100% MDD (AASHTO T99), a 200mm thick natural gravel material sub-base with a minimum CBR of 30%, a 150mm thick 2% cement-treated gravel base, a 50mm sand/quarry dust layer course, and finally, an 80mm layer of heavy-duty concrete paving blocks. The drainage system works include cross pipe culverts, access culverts, lined open drains, and sub-surface drains with diameters of 600mm and 900mm, totaling a length of 1880.11 meters.

Street Lighting Works: The street lighting component involves the installation of two high mast lights, each equipped with a 30m high steel tower, a lockable electrical control switchgear and power meter chamber, and a concrete foundation measuring 3000mm by 3000mm. These high mast lights are designed to provide a radius of illumination covering an area of 150 meters, contributing to enhanced safety and visibility within the Upper Kariokor Settlement.

Scope of works

The proposed projects for the Upper Kariokor Settlement encompass a comprehensive upgrade initiative that includes the construction of roads, footpaths, drainage systems, and streetlight works.

Table A- 1:Proposed project Summary description

Proposed Projects	Description				
	No of Footpaths	No of roads	Widths	Total lengths	Nature of upgrade
1. Roads	-	1	9m	1275m	Upgrade to bitumen standard with side pavements, culverts and crossing paths
2. Drainage system	Description				
	1 Cross pipe culverts and access culverts 2 Lined open and covered drains				
3. Street Lighting- Installation off High Mast lighting	Description				
	No of High Mast lighting		Height		Luminous Radius (Coverage)
	1		30m		150m

Road and Drainage Systems

Road Number	Drawing Reference Name	Road Length (Metres)	Width (m)
Road 01	KISIP 2/TT.TVT/ PP/KARIOKOR ROAD 01	1275	9
Total		1275	

Table A- 2:Road and Drainage Systems

Road entails Carriage way of varied widths between 6m specific to each Alignment and includes a pavement structure.

Project budget

Roads budget

BILL No.	DESCRIPTION	AMOUNT
4.00	SITE CLEARANCE AND TOPSOIL STRIPPING	1,283,899.79
5.00	EARTHWORKS	21,617,372.35
7.00	EXCAVATION AND FILLING FOR STRUCTURES	5,774,427.75
8.00	CULVERT & DRAINAGE WORKS	14,653,737.52
9.00	PASSAGE OF TRAFFIC	1,610,160.97
12.00	NATURAL MATERIAL FOR SUBBASE AND BASE	8,889,870.00
14.00	CEMENT AND LIME TREATMENT	2,584,460.21
15.00	BITUMINOUS SURFACE TREATMENT	9,640,993.72
16.00	WEARING COURSE	17,511,114.40
20.00	ROAD FURNITURE	9,695,074.43
	SUB - TOTAL 1	**93,261,111.14**

Table A- 3:Roads budget

3 No. Street lighting budget

BILL No.	DESCRIPTION	AMOUNT
2.0	FLOODLIGHTING AND OTHER SERVICES	8,976,300
3.0	CIVIL AND STRUCTURAL WORKS	3,399,300
	SUB TOTAL	12,375,600

Table A- 4:3 No. Street lighting budget

Project Activities and Processes

Projects to be Undertaken

1. Upgrade of roads.
2. Construction of storm water drainage.
3. Installation of high- mast lights.

Socio-economic baseline

According to census done in 2019 population statistics of Voi area stood at 111,831 (56115 males 55711 female, intersex 5) Age groups of 0-14 years have 37,286 people, 15-64 have 69,001 people, 65 years and above have 5,539 people. Voi population density is 14.81/Km^2. Voi town be divided into 8 broad land use residential land use is the most predominant in the study area.

Education facilities both private and public are within the vicinity which include Voi Primary School, Voi Mainland academy among others.

Public facilities like hospitals and churches/Mosques are available within the site. River Jordan Hospital, IFC Church, ACK St Johns road among others.

Security in the area is provided by the Kenya Police situated at the Voi Police Station and other security service providers. There is also Nyumba Kumi Initiatives that provide security to their level best.

There are variety of business operating within Project area Shops, Hotels i.e. View Hill Lodge, Auto Spares dealers i.e. Kariokor Auto Spares, Furniture dealers i.e. Voi roadside furniture', Glass operators, Breakdown services, just to mention a few.

Apart from the main road that diverts from Nairobi Mombasa Highway entering Voi town center, Other access roads available within the project area are marram. Other roads around the town center are also tarmacked.

Kenya Power & Lighting Company supplies electricity to the project areas within Voi.

The area is well covered by communication facilities such a Telkom, Safaricom, Airtel among others. All these will facilitate communication during the project cycle.

All sewerage works and repairs within the project area are done by Tavevo Water and Sewerage Company Limited. Though they face a difficult time in dealing with sewerage issues due to poor sewerage plans that exist for the Voi municipality.

The general area is served with water supplied by Tavevo Water and Sewerage Company Limited and private boreholes. The developer intends to use water in the project development process from the supplier.

Taita Taveta County is one of Kenya's ASAL regions with 89% of the County area characterized by semi-arid and arid conditions. The County is mainly dry, except for the Taita hills which are considerably wet. The effect of the South Easterly winds influences the climate of the County. The County has a bimodal rainfall pattern with two rainy seasons. The long rains occur between March and May with a maximum in April. The short rains take place between October and December. Rainfall distribution is uneven, with the highlands receiving higher rainfall than the lowland areas. During the long rains season, the highlands record an average of 265mm while the lowlands

record 157mm whereas, during short rains season, annual rainfall is 1,200mm and 341mm for highlands and lowlands respectively. The annual mean rainfall is 440mm.

The average temperature in the County is 23^0c, with temperatures getting as low as 18.2^0c in the hilly areas, while on lower zones, temperatures rise to about 25^0c. The hottest months are January and March which is a dry season and the coolest season is between May and July.

The long rains are received between the months of March and July while short rains are experienced between the months of October and December. The dry spells are experienced between January and February and also between August and September. Approximately 589 mm | 23.2 inch of rainfall occurs on a yearly basis.

The mean yearly temperature observed in Voi is recorded to be 24.1 °C | 75.5 °F. On average, the month of February experiences the highest temperature with an average value of 26.1 °C | 79.0 °F. In July, the average temperature is 22.2 °C | 72.0 °F. It is the lowest average temperature of the whole year.

The month with the highest relative humidity is December (72.77 %). The month with the lowest relative humidity is February (61.78 %).

There are three types of soil found in voi town Sandy loams; Sandy clay loams; Loam sand soil. Sandy loams are found in large parts of the town. Sandy clay loams are found along River Voi while Loam sand soil is found in areas occupied by the Voi sisal Estate company. The three types of soils are basically less fertile. Voi has a rocky subsoil.

In Voi area people use tapped water from Tavevo Water and Sewerage Company Limited. The Only river that exist that passes through Voi town is the Voi river. Its origin is the Taita Hills and locals use it for irrigation of crops among other things. Aruba dam is located on the Voi River, artificially constructed dam that was purposely constructed by the Kenya Wildlife Service as a water reserve source of water to many animals within Tsavo Wildlife Lodge.

The average hourly wind speed in Voi experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 5 months, from May 19 to October 18, with average wind speeds of more than 8.9 miles per hour. The windiest month of the year in Voi is August, with an average hourly wind speed of 11.4 miles per hour. The calmer time of year lasts for 7.0 months, from October 18 to May 19. The calmest month of the year in Voi is March, with an average hourly wind speed of 6.4 miles per hour.

In Voi, the month with the most daily hours of sunshine is February with an average of 8.26 hours of sunshine. In total there are 256.19 hours of sunshine throughout February. The month with the fewest daily hours of sunshine in Voi is January with an average of 6.82 hours of sunshine a day. In total there are 211.54 hours of sunshine in January. Around 2726.21 hours of sunshine are counted in Voi throughout the year. On average there are 89.7 hours of sunshine per month.

The town of Voi, nestled within the expansive Tsavo National Park in Kenya, boasts a rich and diverse flora. The predominant vegetation in most parts of the town comprises sparsely distributed deciduous bushlands and thickets with widely scattered trees. Among the dominant tree species are Commiphora spp. and Acacia tortilis.

The biological environment of Voi is teeming with a wide variety of fauna, making it a hidden gem within Tsavo National Park. Among the notable wildlife species are elephants, lions, rhinos, leopards, and buffalos – representing the iconic Big Five. Additionally, the local community rears livestock such as cows, goats, ducks, guinea fowl, and chickens, contributing to the dynamic ecological mosaic. Pigeons and doves, along with various other bird species, are part of the avian diversity, adding both visual and auditory richness to the biological tapestry of Voi.

Policy, Legal and Administrative Framework

The ESIA Report preparation was guided by provision of relevant policies, legislation and institutional frameworks that guide preparation of ESIA in Kenya and the international standards, including the World Bank Safeguard Policies. These instruments are presented as follows:

National Laws and Regulations

- The Environmental Management and Co-ordination Act, (EMCA) 1999 and amended in 2015 and subsequent Regulations.
- The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2003 amended 2019.
- Environmental Management and Coordination, (Water Quality) Regulations 2006
- Environmental Management and Co-ordination (Waste Management) Regulations, 2006
- Environmental Management and Co-ordination (Air Quality) Regulations, 2022
- Environmental Management and Coordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulation, 2009
- Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009
- The Kenya Roads Act, 2007
- Public Roads and Roads of Access Act 1972 revised 2010 Cap 399
- The Traffic Act Cap 403 of 2013
- Occupational Health and Safety Act 2007 CAP 514
- The Public Health Act 1986 revised 2012 (Cap 242)
- The Physical and Land Use Planning Act, (PLUPA) 2019
- County Government Act No.17 of 2012
- Urban Areas and Cities (Amendment) Act, 2017.
- National Construction Authority ACT No. 41 of 2011
- Sustainable Waste Management Act 2021
- Children Act (2001), revised 2016
- Employment Act, 2007
- Sexual Offences Act (2006)
- The Constitution of Kenya, 2010

County Laws and Regulation

- Taita Taveta County Climate Change Act 2022

National Policy Framework

- Kenya Vision 2030
- The National Environmental Action Plan (NEAP) 1994
- Policy Paper on Environment and Development 2014
- The National Water Resources Management Policy (1999)
- HIV and AIDS Policy 2009
- Gender Policy 2011
- National Housing policy 2016
- Sessional Paper No. 7 of 2005 on National Employment Policy and Strategies for Kenya
- County Policy Framework
- Taita Taveta County integrated development goals 2023-2027

The Sustainable Development Goals

- SDG Goal 1: No poverty; Through the development of the informal settlement it enhances economic opportunities, improving living conditions, and empowering communities.
- SDG Goal 2: Zero Hunger; Road Upgrade improves and other project developments improve access to food, resilience to climate change, environmental sustainability, and social inclusion.
- SDG Goal 3: Good health & well Being; The project contributes to the improved health and productivity through the provision of a safe and clean environment.
- SDG Goal 4: Quality education; Not Applicable
- SDG Goal 5: Gender equality; By considering the specific needs and priorities of women and girls in these communities during the project phases
- SDG Goal 6: clean water and sanitation; infrastructure improvement within the settlement can contribute to advancing the broader objectives of sustainable water management, sanitation access.
- SDG Goal 7: Affordable and clean energy; The project entails the sustainable usage of energy

to power the high mass lights and other operations of the project.

- SDG Goal 8: Decent work and economic growth; Employment creation that will contribute to reducing the proportion of youth not in employment.
- SDG Goal 9: Industry, Innovation and infrastructure; Through infrastructure development of the settlement it promotes resilience, inclusivity, sustainable development, and innovation within the community.
- SDG Goal 10: Reduced inequalities; Services provided by each project infrastructure is intended to be accessible to all for example the roads constructed.
- SDG Goal 11: Sustainable cities and communities; The proposed project plans to improve/develop informal settlements of Upper Kariokor, Taita Taveta County.
- SDG Goal 12: Responsible consumption and production; Its indirectly applicable through considerations such as waste management, pollution prevention, and Use of resources sustainably impacts on coastal communities.
- SDG Goal 13: Climate action; Integrating climate action principles into the informal settlement upgrade project aligns with SDG Goal 13's objectives by mitigating climate change.
- SDG Goal 14: Life below water; The drainage of the storm water puts into consideration the aquatic life.
- SDG Goal 15: Life on land; Implementing Sustainable development and environmental conservation into the design and implementation of infrastructure projects in informal settlements helps achieve SDG 15.
- SDG Goal 16: Peace justice and strong institutions; Through the development of the informal settlement it enhances economic opportunities, improving living conditions, and empowering communities.
- SDG Goal 17: Partnerships for the goals; Road Upgrade improves and other project developments improve access to food, resilience to climate change, environmental sustainability, and social inclusion.

International Safeguard Policies and Standards

- World Bank OP 4.01 on Environment Assessment
- World Bank Group Environment, Health and Safety Guidelines

Other international instruments used included AfDB Integrated Safeguard System, International Finance Cooperation (IFC) Performance Standard, Labour and Working Conditions, and other applicable international conventions and treaties were also reviewed.

Multilateral Environmental Agreements

Kenya is signatory to several international conventions and treaties that would need to be adhered to in implementing this project and are geared towards environmental protection and conservation. Some of these include;

- ILO Conventions ratified by Government of Kenya
- Safety and Health in Construction Recommendation, 1988
- United Nations Framework Convention on Climate Change
- United Nations Convention on Biological Diversity (UNCBD)

Schedule of Stakeholder Consultations

Meeting	Date	Participants	Gender	
			Male	Female
Technical Consultative Meetings (At Desert Rose Hotel, Voi)	27th November 2023	Taita Taveta County KISIP Coordinator, County Survey Department, County Planning Department, County Lands Department, Health Department, Kenya Red Cross, Social Services Department, Water Department,	12	8

		Ward administration, village administration, and Consultant		
Grievance Redress Committee and Settlement Executive Committee Meetings (At CDF Office, Voi)	28th November 2023	County KISIP Team, County Survey Department, County Planning Department, County Lands Department, Health Department, Kenya Red Cross, Social Services Department, Water Department, Ward administration, village administration, GRC and SEC members, and Consultant	18	24
Public Meetings/Barazas	29th November 2023	County KISIP Team, County Survey Department, County Planning Department, County Lands Department, Health Department, Kenya Red Cross, Social Services Department, Water Department, Ward administration, village administration, GRC and SEC	25	29
- Kariokor Public Meetings		members, Consultant, community members		

Table A- 5:Schedule of Stakeholder Consultations

Comments obtained during the public consultation meetings:

This section provides a summary of the positive impacts of the proposed project as expressed by the stakeholders and public who were interviewed during the meetings.

Employment: This is a key benefit of any project that host communities can gain from a proposed project during construction phase and at operation phase. They thus expressed the need for the proponent to observe the following with regard to employment. Those responsible for project implementation ensure that youth from the area are given priority (60-70%) in recruiting labour force. While recruiting employees during the operation phase there is need to consider local population skilled in various issues.

Project Implementation: Given the immense benefits that the proposed project will produce, the community members urged the proponent to hasten so that the community can start benefitting from it. Those living in towns are especially very keen on the transportation aspect on their environment on storm waste water management, and street lighting.

Manual labour: Community suggested that as much as is practically possible, machinery should not be used where manual labour can be used to increase employment opportunities for the community.

Reduced pollution: The residents living around the project location felt that regular sprinkling of water and road maintenance will help curb the problem of air pollution by dust emission during construction and from potholes. The major source of pollution for the environment was identified to be dust emissions. This has led to loss of aesthetic value of the environment. The proposed project if implemented and operated as envisioned will arrest this pollution

Participation in the life of the community: The proponent has become part and parcel of the local community. There is thus need to fully participate in the life of the local community in improving the life of the people.

Remuneration: Contractors should be advised not to underpay local people who will be employed on casual basis.

Open communication: To avert unnecessary conflicts, there is need for prompt communication to all stakeholders. This could be through the use of the local administration and any information or clarification about stakeholders' position on project need to be promptly availed to any interested party. Any complaints need to be handled through the structured grievance redress mechanism as presented in this report.

Project acceptance and support: There was a near unanimous support for the proposed project. This was as a result of clear explanation of what is proposed and the way forward in the implementation process. The community understood that the project is feasible in all aspects. In addition, the project will spur growth in the area. The local administration indicated that he and the entire community would support the project as long as it promoted development in the area. The community has no objections for the project since there are similar projects in other parts of the country that have benefited the residents.

Compensation: The community from Upper Kariokor settlement expressed a concern regarding the compensation for marked houses set for demolition. This indicated a need for a robust Compensation and Abbreviated Resettlement Action Plan (ARAP). The ARAP outlined clear and fair compensation mechanisms for affected households, ensuring that those losing their homes due to the project are adequately compensated. The compensation package took into account the market value of the properties, any associated relocation costs, and other related expenses.

Stakeholders concerns

The following is a summary of concerns that were raised by the consulted stakeholders regarding implementation of the proposed project;

Positive Comments made by the Stakeholders

The following section provides details on the positive impacts of the proposed project as expressed by the stakeholders who interviewed:

- Creation of Employment Opportunities
- Increased Business Opportunities
- Cheap and Faster Means of Transport
- Easy and Fast Movement of People
- Transfer of Skills

Negative Concerns of the Stakeholders

- Noise pollution
- Dust Generation
- Road Accidents
- Increase in the spread of STD, HIV and AIDS

Project Implementation

Given the immense benefits that the proposed project will produce, the community members urged the proponent to hasten so that the community can start benefitting from it. Those living in towns are especially very keen on the transportation aspect on their environment on storm wastewater management, and street lighting.

Project acceptance and support

There was a near unanimous support for the proposed project. This was as a result of clear explanation of what is proposed and the way forward in the implementation process. The community understood that the project is feasible in all aspects. In addition, the project will spur growth in the area. The local administration indicated that he and the entire community would support the project as long as it promoted development in the area. The community has no objections for the project since there are similar projects in other parts of the country that have benefited the residents.

Identification of Environmental and Social Impacts and Mitigation measures

The proposed comprehensive project has both positive and negative impacts for the Upper Kariokor settlement as highlighted, this could be as well either social and environmental Impacts

The impacts are identified and categorized as positive or negative and those affecting the preconstruction, construction, operation and decommissioning stages of the proposed project

All the identified positive impacts for the proposed project shall be enhanced to have maximum achievement whilst the negative impacts shall be controlled/mitigated so as to minimize on adverse effects as detailed in the Environmental and Social Management and Monitoring Plan ESMMP

Pre-construction stage

Positive Impacts

- Inclusivity in decision making
- Employment for surveys especially enumerators

Negative impact

- Approval delays from NEMA and other Agencies
- Clearing of project corridor
- Risk of excluding some beneficiaries due to unfriendly infrastructure designs

Potential Positive Impacts for Road Upgrade and Storm Water Drainage Construction

- Creation of employment opportunities for maintenance and operation crew.
- Creation of faster means of transport for passengers and bulk cargo within the municipality
- Reduced cost of public transportation.
- Increased security.
- Increased property value
- Improvement of quality of life
- Reduced risk of accidents on the roads.
- Contribution of revenue to the municipality, county, national and regional governments.
- Reduction in Flooding

Potential Positive Impacts for Installation of High Mast Lights

- Enhanced Visibility

- Improved Safety
- Increased Security
- Reduced Crime Rates
- Enhanced Aesthetic Value

Potential Negative Impacts for Road Upgrade

- Environmental Disturbance
- Noise and Excessive Vibrations.
- Air Pollution
- Potential for Construction Accidents
- Generation of Solid Wastes
- Emergence and Spread of Social Vices

Potential Negative Impacts for Storm Water Drainage Construction

- Disturbance to Local Ecology
- Potential Water Contamination
- Disruption to Surrounding Land Use
- Temporary Inconvenience
- Alteration of Natural Drainage Patterns

Potential Negative Impacts on Installation of High Mast Lights

- Energy Consumption
- Disturbance to Nocturnal Wildlife
- Glare and Visual Discomfort.

ESMMP

ESMMP for Preconstruction Stage

ESMMP for Roads, footpaths

Environmental impact	Impact level	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Performance	Frequency	Estimated Cost
	Environmental						
Approval from NEMA and other Agencies for ESIA report	Medium	The Proponent shall ensure that all pertinent permits, certificates, and licenses have been obtained prior to any activities commencing on- site and are strictly adhered to.	Environment licenses Degree of completion of set of required approvals/ permits issued	County Government of Taita Taveta Contractor	EIA/ Number of EIA Permits obtained	Project Cycle	250,000.00
Clearance of Corridors	Medium	In line with the provisions of the RPF, prepare and effectively implement a plan for managing the land-related impacts. Facilitate all affected persons and address all grievances prior to commencing works.	Displacements Number of facilitated PAPs	County Government of Mombasa Consultant KISIP	Visibly marked road reserve	During designing time and construction	242,000.00
	Social impacts						
Divided opinion on project implementations	Medium	Conduct extensive public participation and consultation with key stakeholders	Public opinion, Satisfaction to the relevant authority	Consultant GRC SEC KISIP	-Total project support by all	Throughout all stages from onset	200,000.00
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	Low	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums.	Number of public participation forums held.	KISIP Contactor Consultant GRC EC	SEC/GRC meetings	During designing Stage	250,000.00

ESMMP for Drainages

Environmental impact	Impact level	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Performance	Frequency	Estimated Cost
Environmental							
Approval from NEMA and other Agencies for ESIA report	Medium	The Proponent shall ensure that all pertinent permits, certificates, and licenses have been obtained prior to any activities commencing on- site and are strictly adhered to.	Environment licenses Degree of completion of set of required approvals/ permits issued	County Government of Taita Taveta Contractor	EIA/ Number of EIA Permits obtained	Project Cycle	250,000.00
Clearance of Corridors	Medium	In line with the provisions of the RPF, prepare and effectively implement a plan for managing the land-related impacts. Facilitate all affected persons and address all grievances prior to commencing works.	Displacements Number of facilitated PAPs	County Government of Taita Taveta Consultant KISIP	Visibly marked road reserve	During designing time and construction	242,000.00
Social impacts							
Divided opinion on project implementations	Medium	Conduct extensive public participation and consultation with key stakeholders	Public opinion, Satisfaction to the relevant authority	Consultant GRC SEC KISIP	-Total project support by all	Throughout all stages from onset	200,000.00
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	Low	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums.	Number of public participation forums held.	KISIP Contactor Consultant GRC EC	SEC/GRC meetings	During designing Stage	250,000.00

ESMMP for Streetlights

Environmental impact	Impact level	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Performance	Frequency	Estimated Cost
Environmental							

Approval from NEMA and other Agencies for ESIA report	Medium	The Proponent shall ensure that all pertinent permits, certificates, and licenses have been obtained prior to any activities commencing on- site and are strictly adhered to.	Environment licenses Degree of completion of set of required approvals/ permits issued	County Government of Taita Taveta Contractor	EIA/ Number of EIA Permits obtained	Project Cycle	250,000.00
Clearance of Corridors	Medium	In line with the provisions of the RPF, prepare and effectively implement a plan for managing the land-related impacts. Facilitate all affected persons and address all grievances prior to commencing works.	Displacements Number of facilitated PAPs	County Government of Taita Taveta Consultant KISIP	Visibly marked road reserve	During designing time and construction	242,000.00
Social impacts							
Divided opinion on project implementations	Medium	Conduct extensive public participation and consultation with key stakeholders	Public opinion, Satisfaction to the relevant authority	Consultant GRC SEC KISIP	-Total project support by all	Throughout all stages from onset	200,000.00
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	Low	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums.	Number of public participation forums held.	KISIP Contactor Consultant GRC EC	SEC/GRC meetings	During designing Stage	250,000.00

ESMMP for Construction Phase

ESMMP for Roads and footpaths

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Environmental						
Noise pollution and Excessive Vibrations	Moderate	Enforce EMCA 1999, Revised 2015 (Noise and Excessive Vibrations Regulations of 2009) Maintain noise level within acceptable limits (55 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible,be confined to normal working hours in the residential areas Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity Undertake Noise and Excessive Vibration Assessments Effective use of appropriate PPE (earmuffs) for exposed workers. Proper maintenance of machines. Record and communicated to the Supervising Engineer all noise and excess vibration complains for appropriate action.	Reported complaints from neighbour community and institutions Records of machine and vehicle maintenance Availability and use of Ear Muffs	Environmental Consultants Contractor	Continuous	400,000.00
Air pollution	Moderate	Maintain a speed limit of 20km/h within the site during construction phase to reduce dust particles	Cases of respiratory complication at nearby health centre.	Environmental Consultants Contractor	Continuous	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		emission. Use of environmentally friendly fuels such as Low Sulphur diesel. Regular maintenance and service of construction machinery and equipment in accordance to manufacturer specifications to minimize the generation of hazardous gases. Providing PPEs such as nose masks to the workers in dusty areas on the site. Maintain regular training of all personnel on methods for minimizing air quality impacts during construction. Ensure a strict schedule plan for all equipment to avoid unnecessary trips and minimize idling of engines. Enforce of EMCA 2015 (AirQuality Regulations 2014) Avoid carrying out dust generating activities especially during strong winds Use of covered trucks for material delivery to avoid spills and windblown dust Communicate air quality monitoring results to the public and address concerns proactively. Monitor air quality in the construction area and surrounding neighborhood.	Records of machine and vehicle maintenance Low dust generation during construction Availability and use of Nose Masks			

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Spraying of all earthwork's areas within 200 meters of human settlement to reduce dust.				
Water Pollution	Low	Implement best management practices for construction activities to prevent runoff contamination. Ensure al machineries are serviced at a dedicated service bay to avoid spillages of oil and other fluids Implement erosion control measures to prevent soil runoff into water bodies. Regularly monitor water quality in nearby water bodies during construction and implementing corrective measures. Collaborate with local water authorities to ensure compliance with water quality standards	Water Quality Reports Records of machine and vehicle	Environmental Management Team Water Quality Experts	Throughout Project	500,000.00
Soil pollution / Erosion	Low	Implement soil erosion control measures to prevent the release of contaminants during construction. Regularly monitor soil quality in construction areas and implement corrective measures. Collaborate with environmental agencies to ensure compliance with soil quality standards.	Ground cover in Constructed areas	Environmental Management Team/consultant Contractor	Monthly	400,000.00
Waste Generation	Moderate	Implement a waste management plan, including proper disposal and recycling of construction waste. Educate construction workers on responsible waste disposal practices.	Clean, Organized, Neat Site Presence of waste collection receptacle Contract with NEMA Registered Waste Disposal Firm	Environmental Management Contractor	Throughout Project	500,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Monitor waste generation and disposal practices to ensure compliance with the waste management plan. Practice waste recycling, re use and reduction of waste generation				
Social Risks						
Sexual Exploitation and Abuse	Low Medium	Implement an awareness and prevention program for project workers and the local community. Provide access to HIV testing and counselling services, ensuring confidentiality and non-discrimination. Establish a support system for individuals living with HIV/AIDS, promoting inclusivity and reducing stigma. Alias with local security administration for insecurity management	HIV/AIDS awareness trainings Availability of VCT facilities Social awareness and trainings	Sociologists Environmental and Safety Management Manager Contractor	Throughout Project	300,000.00
Occupational Safety and Health issues	Moderate	Enforce strict safety protocols and provide regular training for all construction personnel. Conduct routine safety inspections and audits to identify and address potential hazards. Establish an emergency response plan to handle accidents promptly and efficiently. Provide all workers with appropriate full protective gear. These include working boots, overalls,	Accidents occurrence incidences recorded in the Incidence Book Workers have Safety Gear(PPEs) Emergency contacts for Hospital and Police available	Environmental and Safety Management Manager Contractor	Weekly	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		helmets, earmuffs, masks, and gloves. Make available a fully equipped First aid kit that is manageable by a trained qualified first aider. Use of signage's at work construction site for communication to non-workers and other road users Conduct regular training Document all near misses, incidents and accidents. Conduct risk assessments for all general, standard and high risk jobs Engage only qualified personnel on operating or conducting high risk jobs Issue work permits after risk assessment is successfully and all workers verified to be fit for work Conduct physical fitness test regularly for all worker Report all work related injuries and health concerns for action to be taken				
Child Exploitation and Abuse	Medium	Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws. Ensure that any child sexual relations offenses among contractors' workers are promptly reported	List of workers that does not contain underage persons	SEC GRC Contractor	Daily	200,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		to the police. Employ workers who are 18 years and above, and with a valid national ID at the time of hire. Implement and monitor the employment register regularly. Comply with the national labor laws and labour management practices. Put visible signage on site "No Jobs for children."				
Increased Crime and Insecurity	Very High	Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices	Availability of security officers Number of security concerns reported.	Environmental and Safety Management Manager Taita Taveta County Traffic Department Officials	Daily	900,000.00
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups.	Number of stakeholders involved and proof of their support.	Contractor SEC and GRC County Government officials, Department of Traffic management Environmental And Safety Management Manager	Throughout Project	250,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.				
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Low Medium	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive	Number of GBV cases reported and solved. GBV Awareness trainings	SEC GRC Contractor Taita Taveta County Government Officials	Throughout Project	150,000.00
Disruption to Public Services	Low Medium	Coordinate with relevant public service providers to adapt services during construction. Communicate service disruptions in advance to minimize inconvenience for residents. Establish a hotline or platform for residents to report service disruptions and address concerns.	Number of complaints from community due to lack of certain services	Environmental and Safety Management Manager Contractor Relevant County Government department with help of KISIP County coordinator	Throughout Project	100,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	High	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums	Number of beneficiaries engaged during the public participation meetings	KISIP Contactor Consultant	Initial and Ongoing	200,000.00

ESMMP for Drainages

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Environmental						
Noise pollution and Excessive Vibrations	Moderate	Enforce EMCA 1999, Revised 2015 (Noise and Excessive Vibrations Regulations of 2009) Maintain noise level within acceptable limits (55 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible,be confined to normal working hours in the residential areas Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity Undertake Noise and Excessive Vibration Assessments Effective use of appropriate PPE (earmuffs) for	Reported complaints from neighbour community and institutions Records of machine and vehicle maintenance Availability and use of Ear Muffs	Environmental Consultants Contractor	Continuous	400,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		exposed workers. Proper maintenance of machines. Record and communicated to the Supervising Engineer all noise and excess vibration complains for appropriate action.				
Air pollution	Moderate	Maintain a speed limit of 20km/h within the site during construction phase to reduce dust particles emission. Use of environmentally friendly fuels such as Low Sulphur diesel. Regular maintenance and service of construction machinery and equipment in accordance to manufacturer specifications to minimize the generation of hazardous gases. Providing PPEs such as nose masks to the workers in dusty areas on the site. Maintain regular training of all personnel on methods for minimizing air quality impacts during construction. Ensure a strict schedule plan for all equipment to avoid unnecessary trips and minimize idling of engines. Enforce of EMCA 2015 (AirQuality Regulations 2014) Avoid carrying out dust generating activities especially during strong winds	Cases of respiratory complication at nearby health centre. Records of machine and vehicle maintenance Low dust generation during construction Availability and use of Nose Masks	Environmental Consultants Contractor	Continuous	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Use of covered trucks for material delivery to avoid spills and windblown dust Communicate air quality monitoring results to the public and address concerns proactively. Monitor air quality in the construction area and surrounding neighborhood. Spraying of all earthwork's areas within 200 meters of human settlement to reduce dust.				
Water Pollution	Low	Implement best management practices for construction activities to prevent runoff contamination. Ensure al machineries are serviced at a dedicated service bay to avoid spillages of oil and other fluids Implement erosion control measures to prevent soil runoff into water bodies. Regularly monitor water quality in nearby water bodies during construction and implementing corrective measures. Collaborate with local water authorities to ensure compliance with water quality standards	Water Quality Reports Records of machine and vehicle	Environmental Management Team Water Quality Experts	Throughout Project	500,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Soil pollution / Erosion	Low	Implement soil erosion control measures to prevent the release of contaminants during construction. Regularly monitor soil quality in construction areas and implement corrective measures. Collaborate with environmental agencies to ensure compliance with soil quality standards.	Ground cover in Constructed areas	Environmental Management Team/consultant Contractor	Monthly	400,000.00
Waste Generation	Moderate	Implement a waste management plan, including proper disposal and recycling of construction waste. Educate construction workers on responsible waste disposal practices. Monitor waste generation and disposal practices to ensure compliance with the waste management plan. Practice waste recycling, re use and reduction of waste generation	Clean, Organized, Neat Site Presence of waste collection receptacle Contract with NEMA Registered Waste Disposal Firm	Environmental Management Contractor	Throughout Project	500,000.00
Social Risks						
Sexual Exploitation and Abuse	Low Medium	Implement an awareness and prevention program for project workers and the local community. Provide access to HIV testing and counselling services, ensuring confidentiality and non-discrimination. Establish a support system for individuals living with HIV/AIDS, promoting inclusivity and reducing stigma. Alias with local security administration for insecurity management	HIV/AIDS awareness trainings Availability of VCT facilities Social awareness and trainings	Sociologists Environmental and Safety Management Manager Contractor	Throughout Project	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Occupational Safety and Health issues	Moderate	Enforce strict safety protocols and provide regular training for all construction personnel. Conduct routine safety inspections and audits to identify and address potential hazards. Establish an emergency response plan to handle accidents promptly and efficiently. Provide all workers with appropriate full protective gear. These include working boots, overalls, helmets, earmuffs, masks, and gloves. Make available a fully equipped First aid kit that is manageable by a trained qualified first aider. Use of signage's at work construction site for communication to non-workers and other road users Conduct regular training Document all near misses, incidents and accidents. Conduct risk assessments for all general, standard and high risk jobs Engage only qualified personnel on operating or conducting high risk jobs Issue work permits after risk assessment is successfully and all workers verified to be fit for work Conduct physical fitness test regularly for all worker Report all work related injuries and health concerns for action to be taken	Accidents occurrence incidences recorded in the Incidence Book Workers have Safety Gear(PPEs) Emergency contacts for Hospital and Police available	Environmental and Safety Management Manager Contractor	Weekly	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Child Exploitation and Abuse	Medium	Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws. Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police. Employ workers who are 18 years and above, and with a valid national ID at the time of hire. Implement and monitor the employment register regularly. Comply with the national labor laws and labour management practices. Put visible signage on site "No Jobs for children."	List of workers that does not contain underage persons	SEC GRC Contractor	Daily	200,000.00
Increased Crime and Insecurity	Very High	Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices	Availability of security officers on site	Environmental and Safety Management Manager Taita Taveta County Traffic Department Officials	Daily	900,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.	Number of stakeholders involved and proof of their support.	Contractor SEC and GRC County Government officials, Department of Traffic management Environmental And Safety Management Manager	Throughout Project	250,000.00
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Low Medium	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive	Number of GBV cases reported and solved. GBV Awareness trainings	SEC GRC Contractor Taita Taveta County Government Officials	Throughout Project	150,000.00
Disruption to Public Services	Low Medium	Coordinate with relevant public service providers to adapt services during construction. Communicate service disruptions in advance to minimize inconvenience for residents. Establish a hotline or platform for residents to report	Number of complaints from community due to lack of certain services	Environmental and Safety Management Manager Contractor Relevant County Government department with help	Throughout Project	100,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		service disruptions and address concerns.		of KISIP County coordinator		
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	High	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums	Number of beneficiaries engaged during the public participation meetings	KISIP Contactor Consultant	Initial and Ongoing	200,000.00

ESMMP for Streetlights

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Environmental						
Waste Generation	Moderate	Implement a waste management plan, including proper disposal and recycling of construction waste. Educate construction workers on responsible waste disposal practices. Monitor waste generation and disposal practices to ensure compliance with the waste management plan. Practice waste recycling, re use and reduction of waste generation	Clean, Organized, Neat Site Presence of waste collection receptacle Contract with NEMA Registered Waste Disposal Firm	Environmental Management Contractor	Throughout Project	500,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Social Risks						
Sexual Exploitation and Abuse	Low Medium	Implement an awareness and prevention program for project workers and the local community. Provide access to HIV testing and counselling services, ensuring confidentiality and non-discrimination. Establish a support system for individuals living with HIV/AIDS, promoting inclusivity and reducing stigma. Alias with local security administration for insecurity management	HIV/AIDS awareness trainings Availability of VCT facilities Social awareness and trainings	Sociologists Environmental and Safety Management Manager Contractor	Throughout Project	300,000.00
Occupational Safety and Health issues	Moderate	Enforce strict safety protocols and provide regular training for all construction personnel. Conduct routine safety inspections and audits to identify and address potential hazards. Establish an emergency response plan to handle accidents promptly and efficiently. Provide all workers with appropriate full protective gear. These include working boots, overalls, helmets, earmuffs, masks, and gloves. Make available a fully equipped First aid kit that is manageable by a trained qualified first aider. Use of signage's at work construction site for communication to non-workers and other road users	Accidents occurrence incidences recorded in the Incidence Book Workers have Safety Gear(PPEs) Emergency contacts for Hospital and Police available	Environmental and Safety Management Manager Contractor	Weekly	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Conduct regular training Document all near misses, incidents and accidents. Conduct risk assessments for all general, standard and high risk jobs Engage only qualified personnel on operating or conducting high risk jobs Issue work permits after risk assessment is successfully and all workers verified to be fit for work Conduct physical fitness test regularly for all worker Report all work related injuries and health concerns for action to be taken				
Child Exploitation and Abuse	Medium	Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws. Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police. Employ workers who are 18 years and above, and with a valid national ID at the time of hire. Implement and monitor the employment register regularly. Comply with the national labor laws and labour	List of workers that does not contain underage persons	SEC GRC Contractor	Daily	200,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		management practices. Put visible signage on site "No Jobs for children."				
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.	Number of stakeholders involved and proof of their support.	Contractor SEC and GRC County Government officials, Department of Traffic management Environmental And Safety Management Manager	Throughout Project	250,000.00
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Low Medium	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive	Number of GBV cases reported and solved. GBV Awareness trainings	SEC GRC Contractor Taita Taveta County Government Officials	Throughout Project	150,000.00
Disruption to Public Services	Low Medium	Coordinate with relevant public service providers to adapt services during construction.	Number of complaints from community due	Environmental and Safety Management Manager	Throughout Project	100,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Communicate service disruptions in advance to minimize inconvenience for residents. Establish a hotline or platform for residents to report service disruptions and address concerns.	to lack of certain services	Contractor Relevant County Government department with help of KISIP County coordinator		
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	High	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums	Number of beneficiaries engaged during the public participation meetings	KISIP Contactor Consultant	Initial and Ongoing	200,000.00

ESMMP for Operational Phase

ESMMP for Roads and footpaths

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Medium high	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive.	Number of GBV cases reported and solved. GBV Awareness trainings	County Government of Taita Taveta; Department of Traffic management, KISIP	Throughout Project	No additional cost
Ineffective Grievance Management	Very High	Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms. Implement a workers' grievances mechanism. Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs. Log, date, process, resolve, and close-out all reported grievances in a timely manner. Ensure proportionate representation of disadvantaged persons in the local grievances committee. Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as	Awareness trainings conducted Grievance complaints documentation Availability of a GRM and SEC committee	County Government of Taita Taveta, KISIP, Contractor	Throughout Project	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		well as anonymity.				
Water Pollution/Contamination	Very Low	Prioritize integrated water management approaches that address both the root causes and symptoms of pollution. Investing in infrastructure for safe drinking water supply, wastewater treatment, and solid waste management Promoting sustainable agricultural practices to reduce runoff and pollution Strengthening regulatory frameworks and enforcement mechanisms to prevent industrial pollution, and raising awareness about the importance of water conservation and pollution prevention among community members. Taking proactive measures to protect water resources	Water quality standards and tests	SEC, GRC, KISIP	Ongoing	No additional cost
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with	Number of stakeholders involved and proof of their support.	SEC, GRC, KISIP	Monthly	200,000.00

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.				

ESMMP for Drainages

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Medium high	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive.	Number of GBV cases reported and solved. GBV Awareness trainings	County Government of Taita Taveta; Department of Traffic management, KISIP	Throughout Project	No additional cost
Ineffective Grievance Management	Very High	Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms. Implement a workers'	Awareness trainings conducted Grievance complaints documentation	County Government of Taita Taveta, KISIP, Contractor	Throughout Project	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		grievances mechanism. Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs. Log, date, process, resolve, and close-out all reported grievances in a timely manner. Ensure proportionate representation of disadvantaged persons in the local grievances committee. Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.	Availability of a GRM and SEC committee			
Water Pollution/Contamination	Very Low	Prioritize integrated water management approaches that address both the root causes and symptoms of pollution. Investing in infrastructure for safe drinking water supply, wastewater treatment, and solid waste management Promoting sustainable agricultural practices to reduce runoff and pollution Strengthening regulatory frameworks and enforcement mechanisms to prevent industrial pollution, and raising	Water quality standards and tests	SEC, GRC, KISIP	Ongoing	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		awareness about the importance of water conservation and pollution prevention among community members. Taking proactive measures to protect water resources				
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.	Number of stakeholders involved and proof of their support.	SEC, GRC, KISIP	Monthly	200,000.00
Alteration of Natural Drainage Patterns	Very Low	Conduct detailed hydrological studies to understand natural drainage patterns. Design drainage systems that mimic natural flow to reduce environmental		SEC, GRC, KISIP	Quarterly	200,000.00

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		impact				

ESMMP for Streetlights

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Medium high	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive.	Number of GBV cases reported and solved. GBV Awareness trainings	County Government of Taita Taveta; Department of Traffic management, KISIP	Throughout Project	No additional cost
Ineffective Grievance Management	Very High	Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms. Implement a workers' grievances mechanism. Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs. Log, date, process, resolve, and close-out all reported grievances in a timely manner. Ensure proportionate representation of disadvantaged persons in the local	Awareness trainings conducted Grievance complaints documentation Availability of a GRM and SEC committee	County Government of Taita Taveta, KISIP, Contractor	Throughout Project	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		grievances committee. Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.				
Energy Consumption	Low Medium	A programmable timer shall control exterior lights. Generator should be provided as a full backup energy source throughout the development. Install and routine maintenance of energy efficient appliances e.g. LED bulbs etc. Monitor energy use during construction and set reasonable limit. Put off all lights immediately when not in use or are not needed. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate. Turn off machinery and equipment when not in use. Use of solar energy as an alternative source of energy at contractor's camp sites.	Reduced and conservative use of energy	County Government of Taita Taveta, KISIP, Contractor	Throughout Project	300,000.00

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.	Number of stakeholders involved and proof of their support.	SEC, GRC, KISIP	Monthly	200,000.00
Light and Visual discomfort	Medium High	Properly design and angle light fixtures to minimize glare. Consider installing light shields or diffusers to control light direction. Seek aviation lighting design principles Use shielded fixtures and directional lighting to minimize light spillage. Implement curfew times for non-essential lighting. Educate the community on responsible		SEC, GRC, KISIP	Throughout Project	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		lighting practices.				
Disturbance to Nocturnal Wildlife	Very Low	Install motion sensors or timers to reduce lighting intensity during periods of low activity. Choose warm-coloured lights that are less disruptive to wildlife.		SEC, GRC, KISIP	Throughout Project	No additional cost

ESMMP for Decommissioning Phase

ESMMP for Roads and footpaths

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Disruption of Services	Low Medium	Implement phased decommissioning to minimize disruption to services. Provide alternative routes or transportation options for affected commuters. Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.	Number of services affected Duration of service disruptions. Percentage of planned versus unplanned disruptions.	SEC, GRC, KISIP, County Government of Taita Taveta	Throughout Decommissioning	No additional cost
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution.	Compliance with environmental regulations and permits. Inspection frequency and compliance with erosion control practices	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	To be established

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Replant native vegetation and restore habitats affected by decommissioning activities.	Survival rates of replanted native vegetation			
Waste Generation	*Low Medium*	Implement recycling and reuse programs for materials like concrete and asphalt. Properly dispose of hazardous materials in accordance with regulations. Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.	Adoption rate of recycled materials in new construction projects Compliance with hazardous waste disposal regulations Implementation of practices to reduce packaging waste, excess materials, and unnecessary disposal.	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	250,000.00
Economic Loss	Low Medium	Provide support and incentives for local businesses affected by decommissioning. Offer compensation or assistance programs to mitigate financial losses. Develop alternative economic opportunities or infrastructure projects to offset any negative economic impacts.	Service disruption metrics and traffic flow management. Compliance with environmental regulations and effectiveness of restoration efforts. Quantity of recycled materials, hazardous waste disposal compliance, and waste reduction. Number of businesses supported, financial assistance effectiveness, and economic diversification progress.	KISIP,SEC,GRC	Throughout Decommissioning	100,000.00
Health and Safety Concerns	Medium	Enforce strict safety regulations and provide adequate training for workers. Implement dust and noise control	Adherence to safety regulations and incident rates. Monitoring dust and noise	KISIP,SEC,GRC	Throughout Decommissioning	200,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		measures to minimize pollution and disturbance to nearby residents. Communicate potential risks to the public and provide guidance on safety precautions.	levels, and compliance with pollution limits. Public awareness and feedback on risk communication effectiveness.			
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	Completion and compliance of environmental impact assessments. Effectiveness of erosion and sediment control measures. Success of habitat restoration and native vegetation replanting. Water quality monitoring results. Stakeholder feedback on environmental impacts and restoration efforts. Adherence to environmental regulations and reporting requirements.	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	300,000.00

ESMMP for Drainages

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Disruption of	Low	Implement phased decommissioning to	Number of services affected	SEC, GRC, KISIP,	Throughout	No

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Services	Medium	minimize disruption to services. Provide alternative routes or transportation options for affected commuters. Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.	Duration of service disruptions. Percentage of planned versus unplanned disruptions.	County Government of Taita Taveta	Decommissioning	additional cost
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	Compliance with environmental regulations and permits. Inspection frequency and compliance with erosion control practices Survival rates of replanted native vegetation	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	To be established
Waste Generation	*Low Medium*	Implement recycling and reuse programs for materials like concrete and asphalt. Properly dispose of hazardous materials in accordance with regulations. Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.	Adoption rate of recycled materials in new construction projects Compliance with hazardous waste disposal regulations Implementation of practices to reduce packaging waste, excess materials, and unnecessary disposal.	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	250,000.00
Economic Loss	Low Medium	Provide support and incentives for local businesses affected by decommissioning.	Service disruption metrics and traffic flow management. Compliance with environmental regulations	KISIP,SEC,GRC	Throughout Decommissioning	100,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Offer compensation or assistance programs to mitigate financial losses. Develop alternative economic opportunities or infrastructure projects to offset any negative economic impacts.	and effectiveness of restoration efforts. Quantity of recycled materials, hazardous waste disposal compliance, and waste reduction. Number of businesses supported, financial assistance effectiveness, and economic diversification progress.			
Health and Safety Concerns	Medium	Enforce strict safety regulations and provide adequate training for workers. Implement dust and noise control measures to minimize pollution and disturbance to nearby residents. Communicate potential risks to the public and provide guidance on safety precautions.	Adherence to safety regulations and incident rates. Monitoring dust and noise levels, and compliance with pollution limits. Public awareness and feedback on risk communication effectiveness.	KISIP,SEC,GRC	Throughout Decommissioning	200,000.00
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	Completion and compliance of environmental impact assessments. Effectiveness of erosion and sediment control measures. Success of habitat restoration and native vegetation replanting. Water quality monitoring results. Stakeholder feedback on	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	300,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
			environmental impacts and restoration efforts. Adherence to environmental regulations and reporting requirements.			

ESMMP for Street lighting

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Disruption of Services	Low Medium	Implement phased decommissioning to minimize disruption to services. Provide alternative routes or transportation options for affected commuters. Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.	Number of services affected Duration of service disruptions. Percentage of planned versus unplanned disruptions.	SEC, GRC, KISIP, County Government of Taita Taveta	Throughout Decommissioning	No additional cost
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	Compliance with environmental regulations and permits. Inspection frequency and compliance with erosion control practices Survival rates of replanted native vegetation	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	To be established
Waste Generation	*Low Medium*	Implement recycling and reuse programs for materials like concrete and asphalt. Properly dispose of hazardous materials in accordance with regulations. Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.	Adoption rate of recycled materials in new construction projects Compliance with hazardous waste disposal regulations Implementation of practices to reduce packaging waste, excess materials, and unnecessary disposal.	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	250,000.00
Economic Loss	Low Medium	Provide support and incentives for local	Service disruption metrics and traffic flow management.	KISIP,SEC,GRC	Throughout Decommissioning	100,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		businesses affected by decommissioning. Offer compensation or assistance programs to mitigate financial losses. Develop alternative economic opportunities or infrastructure projects to offset any negative economic impacts.	Compliance with environmental regulations and effectiveness of restoration efforts. Quantity of recycled materials, hazardous waste disposal compliance, and waste reduction. Number of businesses supported, financial assistance effectiveness, and economic diversification progress.			
Health and Safety Concerns	Medium	Enforce strict safety regulations and provide adequate training for workers. Implement dust and noise control measures to minimize pollution and disturbance to nearby residents. Communicate potential risks to the public and provide guidance on safety precautions.	Adherence to safety regulations and incident rates. Monitoring dust and noise levels, and compliance with pollution limits. Public awareness and feedback on risk communication effectiveness.	KISIP,SEC,GRC	Throughout Decommissioning	200,000.00
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning	Completion and compliance of environmental impact assessments. Effectiveness of erosion and sediment control measures. Success of habitat restoration and native vegetation replanting. Water quality monitoring	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	300,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		activities.	results. Stakeholder feedback on environmental impacts and restoration efforts. Adherence to environmental regulations and reporting requirements.			

Grievance Redress Mechanism

The overall objective of the GRM is to establish an effective communication channel among project stakeholders for providing a timely and efficient two-way feedback mechanism to address any grievances and complaints against the project from multiple stakeholders and Project Affected. This GRM complies with the Law of Kenya and international best practices. During the proposed implementation of Upper-Kariokor projects, grievances, complaints as well as disputes are expected to arise from several stages of the project including design and implementation phase.

Effective and timely response to community complaints is essential for maintaining good community relations. KISIP is committed to having an effective complaint handling system that reflects the needs, expectations and rights of complainants.

The Three Tier of Grievance Redress Mechanism

Informal Resolution; This initial tier involves resolving grievances through informal means, such as direct communication between the aggrieved party and the concerned individual or department. It may include discussions, meetings, or informal mediation to resolve the issue before it escalates further. The goal here is to address the grievance swiftly and amicably without formal procedures.

Formal Resolution; If the grievance is not resolved at the informal level or if it is of a serious nature, it moves to the formal resolution tier. Formal resolution often involves submitting a written complaint or grievance through designated channels within the organization or institution. This tier may include a structured investigation process, hearings, or meetings with designated grievance redressal authorities. The decision or resolution at this level is typically documented and communicated to the parties involved.

Appellate or Escalation Level; If the aggrieved party is not satisfied with the resolution provided at the formal level, they may have the option to escalate the matter to a higher authority or an appellate body. This tier involves a review of the previous decisions or actions taken, and it may include a reconsideration of the grievance based on new evidence or arguments presented. The appellate or escalation level provides a final opportunity for a fair and impartial review of the grievance before a decision is made.

World Bank Group Grievance Redress Service

The World Bank Group's Grievance Redress Service (GRS) is an essential mechanism for addressing complaints and grievances related to projects funded by the World Bank Group. The GRS aims to provide affected communities, also known as Project Affected People (PAPs), with a platform to voice their concerns and seek resolutions.

Purpose of GRS; The primary purpose of the Grievance Redress Service is to ensure that affected individuals and communities have a voice in projects financed by the World Bank Group. It is designed to address complaints related to social and environmental issues, human rights violations, resettlement concerns, and other project-related grievances.

Types of Complaints

- Social issues: Such as community displacement, loss of livelihoods, cultural heritage preservation.
- Environmental concerns: Such as pollution, deforestation, water contamination.
- Human rights violations: Such as labor rights abuses, discrimination, lack of consultation with affected groups.

Complaints can be lodged through the following;

Identify the Issue: Clearly identify the specific issue or grievance you want to raise. Provide details, evidence, and supporting documents if available.

Contact GRS: PAPs can contact the Grievance Redress Service directly through various channels.

Submit the Complaint: Follow the instructions provided by the GRS for submitting your complaint. Include all relevant information and documents to support your case.

Wait for Acknowledgment: Once the complaint is submitted, the GRS will acknowledge receipt and begin the review process.

Confidentiality and Protection: The GRS respects the confidentiality of complainants and ensures protection against any reprisals or retaliation for lodging a complaint. PAPs' identities are generally kept confidential unless consent is provided otherwise.

Monitoring and Evaluation: After a complaint is resolved, the GRS may conduct monitoring and evaluation to assess the effectiveness of the resolution and identify lessons learned for future projects.

Conclusions and Recommendations

The ESIA study has determined that the proposed Upper Kariokor Settlement upgrade project is a worthwhile venture, expected to significantly bolster the community economic progress. Yet, the study also highlights some adverse impacts linked to the project. Nonetheless, the proponent commits to implement several measures aimed at mitigating these negative environmental, safety, health, and social effects throughout the project's lifespan through implementation of the comprehensive environmental management plan.

The intention is to fully capitalize on the positive outcomes outlined in the report resulting from the project. Given the significant socio-economic and environmental advantages anticipated from the proposed development, the CPR report indicates no significant adverse impacts.

We recommend that the project moves forward under the condition that the proponent strictly follows the mitigation measures outlined here and fully implements the proposed Environmental Management Plan. The Upper Kariokor Settlement currently suffers from inadequate and poor roads and lighting infrastructure because existing systems are not in proper functioning conditions and insufficient. Therefore, the proposed development of infrastructure at the Upper Kariokor Settlement will significantly alleviate most of the challenges faced by residents in the area.

Budget for GRM

S/No	Description	Monthly Cost in Kshs	Annual cost
1	GRC facilitation fee for 12 members of the committee	12,000	144,000
2	GRC meeting venue	5,000	60,000
3	Others	10,000	120,000
	TOTAL	**27,000**	**324,000**

Table A- 10:GRM budget

1. INTRODUCTION

1.1 Background Information

The Government of Kenya with support from the World Bank and Agence Francaise Developement (AFD) is implementing the Kenya Informal Settlements Improvements Project II (KISIP 2 to consolidate the gains made under KISIP I and enhance the benefits of the project to more people in informal settlements. This Second phase of the Kenya Informal Settlements Project (KISIP 2) will build on the successes and lessons learned from KISIP 1, but also introduce new interventions to deepen its overall impact. It will support the interventions that have been successful under KISIP I, namely: tenure regularization, infrastructure upgrading, and institutional strengthening. Unlike KISIP 1, however, the proposed project will include new approaches and new activities to strengthen its impact on the participating communities.

A new approach is to support tenure regularization and infrastructure upgrading in the same communities through one integrated planning approach, aimed at saving both money and time and ensuring better coordination between the two interventions. In addition, the project will include activities to link vulnerable people (elderly, orphans, disabled, and others) of informal settlements to government programs aimed at reducing poverty and vulnerability, and to link at-risk youth to programs focused on building skills and creating opportunities for (self-) employment.

KISIP 2 will include activities to prevent crime and violence. KISIP 2 will support the government's housing agenda, one of top four priorities under the current administration. Cross-country experience shows that strengthening security of tenure and investing in infrastructure in informal settlements induces significant private investment in housing and businesses. Indeed, many of the informal settlements that have benefited from upgrading under KISIP 1, have experienced an investment boom, with new multi-story buildings replacing poorly constructed informal housing units.

One noticeable characteristic of developing countries in the Sub-Saharan desert is dense population in urban centres especially in informal settlement, Kenya is not an exception. Informal settlements rise as a result of non-inclusivity into well-structured urban plans and for this reason, without proper mitigation the scenario has a potential of encouraging widespread poverty owing to the fact that there is absence of proper infrastructure to accommodate the high rising populations. For this reason, the Government of Kenya (GoK) in her commitment to support urban development is in consultation with the World Bank for consideration of the Second Kenya Informal Settlements Improvements Project (KISIP 2). This Second phase of the Kenya Informal Settlements Project (KISIP 2) will build on the successes and lessons learned from KISIP I and in addition introduce new interventions to deepen its overall impact. It will support the interventions that have been successful under KISIP I, namely:

- Tenure Regularization
- Infrastructure upgrading and
- Institutional strengthening.

The proposed project shall include new approaches and new activities to strengthen its impact on the participating communities. These approaches include:

- Supporting tenure regularization and infrastructure upgrading in the same communities through one integrated planning approach, aimed at saving both money and time and ensuring better coordination between the two interventions.
- Activities to reduce/prevent crime and violence

The proposed project will include activities to link:

- Vulnerable people (elderly, orphans, disabled, and others) of informal settlements to government programs that are aimed at reducing poverty and vulnerability,
- At-risk youth to programs focused on building skills and creating opportunities for (self-) employment.
- Support the government's housing agenda, one of top four priorities under the current administration

Cross-country experience shows that strengthening security of tenure and investing in infrastructure in informal settlements induces significant private investment in housing and businesses.

In a tier fund amongst World Bank, Agence Francaise Developement (AFD) and the GoK, Taita Taveta County is one amongst counties considered for the KISIP. Upper Kariokor settlement in Voi Sub-County is one amongst the two settlements identified for the upgrading program and specifically:

1. Road upgrade and drainage system construction.
2. Installation of High Mast Lighting

Proposed Projects is intended to be implemented in Upper Kariokor, Voi Sub County, Taita Taveta County in the Coast region of Kenya.

1.2 Project objectives

- Enhanced Access to Basic Services: Improve the accessibility of residents in participating urban informal settlements to essential services through the development of upgraded roads, storm water drainage systems, and installation of high-mast lights. Facilitate improved transportation infrastructure, contributing to enhanced access to healthcare, education, and other critical services within the project area.
- Tenure Security Improvement: Strengthen tenure security for residents in the targeted informal settlements by implementing robust stormwater drainage systems, mitigating potential risks related to flooding and water-related hazards. Enhance the safety and stability of the settlement environment through the upgrade of roads, reducing the vulnerability of residents to environmental challenges.
- Infrastructure Investment Based on Community Plans: Align the proposed infrastructure development, including road upgrades and storm water drainage, with plans developed in consultation with beneficiary communities. Ensure that the project addresses the specific needs and priorities identified by the residents.
- Support for Planning, Surveying, and Land Document Issuance: Contribute to the project's development objective by supporting planning activities, surveying processes, and issuance of land documents for residents of informal settlements. This ensures a systematic approach to land tenure and property documentation, promoting security and legal recognition.
- Strengthening Institutional Capacity for Slum Upgrading: Enhance the institutional capacity of county administrations to effectively plan, implement, and manage slum upgrading initiatives. This includes providing support for the coordination of infrastructure projects and ensuring the sustainable development of informal settlements.
- Community-Driven Development: Emphasize a community-driven development approach by involving residents in the decision-making processes related to infrastructure development. Promote active community participation in the planning and execution of the project, fostering a sense of ownership and sustainability.
- County Administration Empowerment: Empower county administrations to deliver on their mandates related to slum upgrading by providing the necessary capacity-building initiatives. Strengthening the administrative capabilities of counties contributes to more efficient and effective implementation of infrastructure projects and overall development initiatives.

1.3 Objectives of the Comprehensive Project Report.

The CPR like any other Environmental & Social Impact Assessment (ESIA) is expected to achieve the following objectives:

- To identify all potential significant environmental and social impacts of the proposed Project and recommend measures for mitigation.
- To assess and predict the potential impacts during site preparation, construction, operational and decommissioning stages of the Project.
- To verify compliance with environmental regulations.
- To generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the Project cycle.
- To allow for public participation.
- To prepare an Environmental and Social Management Plan to mitigate the identified impacts so as to ensure sustainability of the proposed Projects.
- To recommend cost effective measures to be implemented to mitigate against the negative impacts.

The ESIA report has been prepared in accordance with the Client Guidelines, the Environmental (Impact Assessment and Audit) Regulations, 2003 (and the amendment Regulations of 2019) and Environmental Management and Coordination Act (EMCA) 1999 amended in 2015).

1.4 Scope of the Study

In order to identify the potential environmental and social impacts, and to come up with the proper mitigation measures for the proposed projects consultant used both conventional and participatory approaches. In conducting this exercise, the consultant.

i. Conducted project site visits, consulting with the local communities, and other relevant key stakeholders.
ii. Carried out comprehensive assessment ensuring all environmental concerns and views of all parties/persons likely to be affected by the project are taken into consideration.
iii. Reviewed the preliminary designs for the proposed project to get acquainted with environmental issues in the project site vicinity.
iv. Schedule time for site visiting activities to be undertaken for the ESIA.
v. Developed an environmental and social management and monitoring plan with mechanisms for evaluating compliance and environmental performance, which include the cost of mitigation measures and the timeframe of implementing the measures.
vi. Publicized the project and its anticipated effects by posters in strategic places, publishing a notice in both official and local languages in the Kenyan Gazette and one of the local dailies.
vii. Liaising with NEMA for compliance with all mandatory and regulatory requirements relating to the ESIA.

1.5 Terms of Reference (ToR)

In compliance with legal and professional requirements, it is expected that the outputs from this study reflect a consultative process whose presentation will be through modern technology that will form part of digital land information systems for informal settlements being generated by KISIP.

The authenticity requires the consultant to conduct the below tasks

1. Assessment and description of location/site, objectives, scope, nature of the proposed project,
2. Analysis of the proposed project activities during the proposed project cycle; construction, operation, decommissioning phases,
3. Establish the suitability of the proposed project in the proposed location,

4. Review and establish all relevant baseline information as will be required by NEMA (Physical, Biological and Social Cultural and economic) and identify any information gaps,
5. Description and analysis of policy legal and institutional framework including but not limited to Kenyan policies, laws, regulation and guidelines which have a bearing on the proposed project and will also serve as benchmarks for monitoring and evaluation, and future environmental audits,
6. In-depth description of the proposed project and associated works together with the requirements for carrying out the works,
7. Analysis of the designs, technology, procedures and processes to be used, in the implementation of the works,
8. Consultation and Public Participation (CPP): Identify key stakeholders and affected persons; hold a public meeting and provide /collect written evidence i.e. minutes,
9. Identify and analyze proposed project alternatives including but not limited to: Scale and extent; project site alternatives, no project alternatives, design alternatives, material alternatives and technologies alternatives,
10. Identify, predict and carry out in-depth analysis all actual potential and significant impacts on flora, fauna, soils, air, water, the social, cultural and community settings; the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated to be generated by the proposed project, both positive and negative throughout the project cycle,
11. Recommend sufficient mitigation measures for all the potential negative impacts identified,
12. Analyze occupational health and safety issue associated with the proposed project,
13. Develop an Environmental and Social Management Plan (ESMMP) proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.

1.6 Justification of the ESIA

The implementation of the proposed project shall have both socio-economic and environmental impacts on the projectarea. In order to alleviate any detrimental effects of the project, there is need to assess possible impacts of the development on the environment and the socio-economic attributes of the project area. At first, the proposed project will be evaluated against the framework provided by the Physical Development plan to ensure proper alignment. Then an Environmental Impact Assessment is conducted in accordance with the Client Guidelines, Environmental Management and Co-ordination Act (EMCA), Act, Cap 387, and the Environmental (Impact Assessment and Audit) Regulations, 2009 (and the amendment Regulations of 2019).

Due to the likely socio-economic impacts of the project, our Environmental Specialist and Socio-Economic Specialist have also collected socio-economic data to support the Environmental Impact Assessment and also to be used for Economic Evaluation of the Project. They were assisted by Field Assistants and a group of Enumerators especially in the process of acquiring the primary data in the field.

The execution of the assignment was carried out during the preliminary design of the Project to ensure that the designs produced comply with environmental requirements and take into account socio-economic status in the areas. The outcome of the Environmental Impact Assessment will be used to moderate the Engineers' Designs to ensure that they are in harmony with the environmental and socio-economic attributes of the project area. This approach will enhance the protection of the environment and the local community from negative effects of development.

1.7 Environmental and Social Impact and Assessment Team

Table 1: Summary of EIA Team and Responsibilities

Designation	Name	Responsibilities
Lead Expert	Charles Muyembe	• Supervise ESIA field Surveys and Socio

		economic field surveys' • Provide general guidance • Review ESIA Reports and Socio Economic Reports
Environmentalist	1. Muriuki Alex 2. Kashim Oginga 3. Allan Kirombo 4. Michael Morse 5. Saraphina Nasimiyu	• Carrying out Field Surveys/Assessments • Drafting of ESIA reports
Sociologists	Charity Gathuthi	• Conducting Socioeconomic Field assessments • Drafting of socioeconomic reports

1.8 ESIA APPROACH METHODOLOGY

As stated earlier, the ESIA Study was carried out in compliance with the government of Kenya's Environment Management and Coordination Act of 1999 and the Environmental (Impact Assessment and Audit) Regulations 2003, World Banks Environmental and Social Performance Standards and Equator Principles among other relevant laws, regulations and guideline standards.

The general steps followed during the assessment were as follows:

1. Environmental and social screening, in which the project was identified as among those requiring Environmental and Social Impact Assessment under schedule 2 of EMCA, 1999
2. Environmental scoping that provided the key environmental issues
3. Desktop studies
4. Physical inspection of the area and surrounding areas
5. ESIA Public participation via the use of general questionnaires, key informants' interviews, socio-economic surveys and interactive meetings
6. Data analysis and
7. Report preparation.

1.8.1 Environmental and Social Screening

This step was conducted through legal review and desktop studies to assess whether there will be a need for an environmental and social impact assessment, and what level of assessment is necessary. This was done using a screening checklist in reference to requirements of the EMCA, 1999, and specifically the second schedule. The proposed projects are listed as medium risk projects in Legal Notice 31&32 of EMCA and under the World Banks framework, as Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures.

The project screening report indicating the Environmental and Social Management Framework checklist as well as the Resettlement Policy Framework checklist have been annexed in the report below.

1.8.2 Environmental Social Management Framework

An Environmental Social and Management Framework (ESMF) serves as a comprehensive guideline for ensuring that projects adhere to environmental and social sustainability principles.

The Environmental Social and Management Framework (ESMF) outlined the policies, procedures, and guidelines for managing environmental and social risks associated with project implementation. It provided a systematic approach to identify, assess, and mitigate potential environmental and social impacts throughout the project lifecycle.

An ESMF provides a structured approach to managing environmental and social risks associated with project implementation, aligning with the objectives of EMCA to ensure sustainable development and environmental protection. Additionally; World bank's OP 4.01 requires projects to assess and manage environmental and social risks, and an ESMF serves as a tool to fulfil this requirement comprehensively.

1.8.3 Relocation Policy framework

Relocation Policy framework screening can be utilized as a methodology in an Environmental Social Impact Assessment (ESIA) to assess the potential impacts of a project on communities and individuals who may be displaced or affected by relocation.

The World Bank's Safeguard Policies provide guidelines for projects it finances to ensure that adverse social and environmental impacts are identified and mitigated. While the World Bank does not have a specific Safeguard Policy dedicated solely to relocation, aspects of relocation are addressed in several of its policies, including:

1. **Involuntary Resettlement (OP/BP 4.12):** This policy outlines measures to address the adverse impacts of involuntary resettlement, including compensation, assistance with relocation, and opportunities for affected people to participate in planning and implementing resettlement programs. It emphasizes avoiding or minimizing displacement whenever possible and improving the livelihoods of affected people.
2. **Environmental Assessment (OP/BP 4.01):** This policy requires projects to assess potential environmental and social impacts, including those related to relocation. It emphasizes the importance of identifying and mitigating adverse impacts on affected communities, including through appropriate resettlement measures.
3. **Labour and Working Conditions (OP/BP 4.11):** This policy includes provisions related to involuntary resettlement, ensuring that affected workers are provided with adequate compensation, assistance with relocation, and opportunities for alternative employment or income-generation activities.
4. **World Bank Group Environment, Health and Safety Guidelines (EHSGs):** The World Bank Group Environment, Health, and Safety Guidelines (EHSGs) provide technical advice and guidance on best practices for managing environmental, health, and safety risks associated with various industries and sectors. These guidelines aim to assist project developers, financiers, and other stakeholders in identifying potential environmental and social impacts, as well as implementing measures to minimize or mitigate these impacts. The EHSGs cover a wide range of topics, including air and water pollution, biodiversity conservation, occupational health and safety, and community health and safety. They are based on international standards and best practices, taking into account the specific circumstances and requirements of different regions and industries. Overall, the EHSGs serve as a valuable resource for promoting sustainable development and responsible business practices across the globe.
5. **Operational Policy (OP 4.07) on Natural Habitats:** aimed at guiding projects financed by the World Bank to effectively manage and conserve natural habitats. This policy emphasizes the importance of protecting biodiversity and ecosystem services while promoting sustainable development. OP 4.07 outlines principles and standards for assessing and managing potential impacts on natural habitats throughout the project lifecycle. Key aspects covered include the identification of critical habitats, assessment of potential impacts, avoidance and minimization measures, and compensation for residual impacts. The policy also emphasizes the importance of stakeholder engagement, transparency, and accountability in natural habitat conservation efforts. By adhering to OP 4.07, project proponents can ensure that their activities are conducted in a manner that preserves biodiversity and ecosystem integrity, contributing to long-term environmental sustainability.
6. **Operational Policy (OP 4.09) on Water Resources Management**: it guides projects funded by the World Bank in sustainable water management, emphasizing integrated approaches to address water scarcity, pollution, and access challenges. The policy promotes water efficiency, quality protection, and equitable access to safe water and sanitation services. It also prioritizes stakeholder engagement, gender equality, and climate resilience. Adhering to OP 4.09 helps achieve sustainable water management, enhancing water security and livelihoods while protecting ecosystems.

1.8.4 Environmental and Social Scoping

The scoping process, through an ESIA scoping checklist, was conducted to help narrow down onto the most critical issues requiring attention during the assessment. Environmental issues were categorized into physical, natural/ecological and social, economic and cultural aspects. It also included discussions with key stakeholders, managers and design engineers as well as interviews with local communities. Data from secondary sources was used to outline the bio-physical features, socio-economic characteristics of the residents, the existing infrastructure services and the forms of land tenure.

1.8.5 Desktop Study

Desktop study included document review on the nature of the proposed activities, project documents, designs, policy and legislative framework as well as the environmental setting of the area among others. This method was achieved through;

8. Data Collection: The desktop study begun with gathering relevant data from various sources. This includes geological maps, topographical surveys, historical records, land use patterns, environmental reports, and any existing documentation related to Upper Kariokor Settlement.
9. Review of Regulations: Understanding the legal and regulatory framework is essential. This involved studying laws, and environmental regulations, and any other pertinent rules that may influence the project's design and execution.
10. Environmental Analysis: Assessments related to environmental factors such as air quality, water resources, soil composition, and potential hazards (like flood zones or contaminated sites) were conducted based on available data. This helped in identifying potential risks and mitigation measures.
11. Infrastructure Evaluation: The existing infrastructure surrounding the site was evaluated, including transportation networks, utilities (water, electricity, sewage), and telecommunications. This information was crucial for determining project feasibility and integration into the existing infrastructure.
12. Risk Assessment: Potential risks such as natural disasters (earthquakes, floods), environmental hazards (pollution, waste disposal), and socio-economic factors (population density, economic trends) were analyzed to gauge their impact on the project.
13. Stakeholder Analysis: Identification of stakeholders, including local communities, government agencies, NGOs, and other relevant parties, was done to understand their interests, concerns, and potential contributions or obstacles to the project.

1.8.6 Site Assessment

Field visits were made for physical inspections of the areas around the project site and the environmental status of the surrounding areas to determine the anticipated impacts. Site assessment was undertaken through the following;

- Physical Inspection: A site visit was conducted to assess the actual conditions on the ground. This included evaluating terrain features, vegetation, existing structures, drainage patterns, and any visible signs of environmental impact or contamination.
- Surveying: Precise measurements and surveys were carried out to map the site accurately. This involved using tools like GPS, total stations, and other surveying equipment to create detailed topographical maps and layouts.
- Ecological Assessment: This included identifying flora and fauna species, assessing habitat quality, and evaluating potential impacts on ecosystems due to the project's development.
- Archaeological and Cultural Surveys: Archaeological surveys were carried out to identify artefacts or structures of value. Cultural impact assessments were done to ensure project activities respect local heritage and traditions.
- Utility Mapping: Utility lines (such as water pipes, gas lines, electrical cables) were located and mapped to avoid accidental damage during construction and to plan utility relocations if necessary.
- Safety and Accessibility: Evaluating safety hazards on-site and ensuring accessibility for workers, equipment, and emergency services are integral parts of the site assessment. This included assessing risks related to construction activities and implementing safety protocols.

1.8.7 Public Participation

Public participation meetings were conducted specifically the project area. To ensure adequate public participation in the ESIA process, questionnaires were administered to the local communities, and the information gathered was subsequently synthesized and incorporated into the ESIA Comprehensive Project

Report (CPR). Additionally, the consultant incorporated the concerns and views of all stakeholders and the affected people.

1.8.8 General questionnaires

Questionnaires were structured to gather data from respondents on various subjects. Typically, they began with an introduction outlining the purpose; followed by sections for demographic information such as age, gender, education, and occupation.

The main body of the questionnaire comprises clear and specific questions, including both closed-ended (multiple-choice, yes/no) and open-ended formats, organized logically to address the primary objectives. Additional sections allow for detailed feedback or exploration of specific topics. Before deployment, questionnaires undergo review and pilot testing to ensure clarity, relevance, and accuracy.

1.8.9 Key informants' interviews

Following this, background information is gathered from the informant, including details about their expertise or experience. The main body of the interview consists of focused questions designed to elicit detailed insights or perspectives on specific aspects of the topic, with the interviewer probing further and seeking clarification where necessary.

Towards the end of the interview, the interviewer may summarize key points discussed, inviting the informant to reflect on additional insights. The interview concludes with gratitude for participation and a reminder of any follow-up steps. Subsequently, the conversation is transcribed and analyzed to extract relevant themes and insights.

Key informant interviews served as invaluable tools for obtaining rich qualitative data, offering nuanced perspectives that complement quantitative research methods.

Some of the key informants came from members of the youth, people with disabilities, women, public facility institutions and religious leaders

1.8.10 Socio-economic surveys

Socioeconomic surveys are comprehensive data collection efforts aimed at understanding the social and economic characteristics of a population or specific groups within it.

These surveys began with the careful selection of a representative sample using various sampling techniques to ensure accuracy and reliability. A structured questionnaire is then developed to gather information on demographics, income, education, employment, housing, health, and access to services. Trained surveyors administered the questionnaire through face-to-face interviews, adhering to standardized protocols to maintain data quality.

Once data collection was completed, the collected data underwent rigorous analysis, utilizing both descriptive and inferential statistical methods to summarize trends and draw meaningful conclusions.

The findings of the socioeconomic survey were then interpreted and reported, providing valuable insights to inform decisions and program planning,

1.8.11 Interactive meetings

These meetings were characterized by active engagement, with participants encouraged to contribute their insights, ask questions, and provide feedback. Through interactive tools such as brainstorming sessions, group

discussions, and breakout activities, attendees had the opportunity to explore topics in depth, share diverse perspectives, and generate innovative solutions. Facilitators/consultants played a crucial role in guiding the discussions, ensuring that all voices are heard, and maintaining a constructive and inclusive environment. By fostering meaningful interaction and collaboration, interactive meetings led a better decision-making, and largely informed the consultants on proposed projects.

1.8.12 Data Analysis, Reporting and Documentation

Data was quantitatively and qualitatively analyzed in terms of themes. The Environmental Social Impact Assessment Study Report was compiled from the findings in accordance with the guidelines issued by NEMA for such works and prepared and submitted by the proponent for consideration and approval. The Consultant ensured constant briefing of the client during the exercise.

2. PROJECT DESCRIPTION, DESIGN AND IMPLEMENTATION

2.1 Project location

Taita Taveta County is located in the Coastal Region of Kenya and is one of the six coastal counties of the Republic of Kenya. The County borders Tana River, Kitui and Makueni counties to the North, Kwale and Kilifi counties to the East, Kajiado to the North-west, and the Republic of Tanzania to the South and South-west. It ranges in altitude from 500m above sea level to 2,300m at Vuria peak, which is the county's highest point. The land area of the County is 17,084 square kilometers, of which 11,000 Km^2 is occupied by two National parks; Tsavo East and Tsavo West.

Upper Kariakor is a village located in the outskirts of Voi town. Administratively, it can be found in Mbololo ward, Voi sub county. It lies in the lowlands of Taita Taveta County and is close to African Wildlife Foundation, Tsavo and the sub county offices. The settlement is a part of Kariako settlement together with Lower and Central Kariako. The three are considered to be the oldest residential areas of Voi Town. The settlement is accessed through the Desert Rose hotel turn in off the Kaloleni -Kariakor road. The settlement coordinates are 3°23'18"S 38°33'25"E

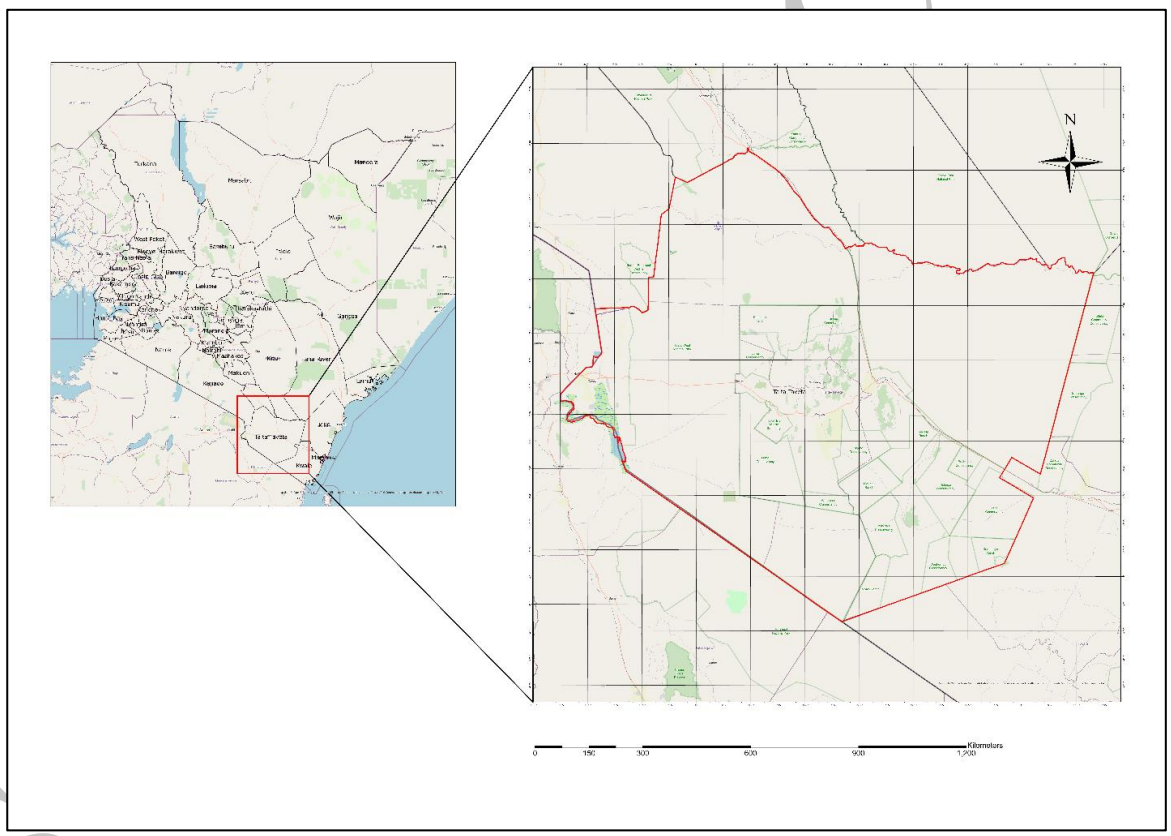


Figure 1: General Project Location Map

The Upper Kariokor Settlement, a focal point for proposed development, is situated in Taita Taveta County, within Voi Sub County, Voi Location, Mwangea Sub Location, and Mbololo ward. This area is part of the larger Voi town in Kenya. The coordinates for the starting point of the proposed road upgrade and stormwater drainage are at Desert Rose Hotel (3°23'49.8"S, 38°33'20.5"E) with an elevation of 124 meters above sea level. The road extends to its endpoint at Moi County Referral Hospital (3°12'36.70"S, 40° 6'38.79"E) with an elevation of 131 meters above sea level. The total length of the road to be constructed measures approximately 1.4 kilometers, and its width is approximately 10 meters.

Structures and features along the proposed project route include perimeter walls, various shops, planted trees, a limited number of shrubs, and residential homes. Additionally, public institutions such as Voi Primary School, Mwakingali Primary and Mwanyambo Primary School contribute to the diverse landscape. The coexistence of

these structures and features necessitates a comprehensive approach to the development, considering the existing urban fabric and potential impacts on both the natural and built environment.
Mbololo ward, where the settlement is located, exhibits two distinct topographical zones: a lowland zone and a highland zone. Noteworthy physical features within the ward include Tsavo East National Park, Mbololo Hill, and Mbololo Forest. The climatic conditions experienced by the settlement are characterized as arid and semi-arid. Upper Kariokor is slightly densely populated, with a mix of residential and commercial structures contributing to the overall urban character.
The proposed road upgrade, stormwater drainage system, and high-mast light installation in Upper Kariokor Settlement represent a pivotal intervention that must be approached with careful consideration of the existing socio-economic, cultural, and environmental context. The floodlight will be erected near Kariokor welfare social hall.

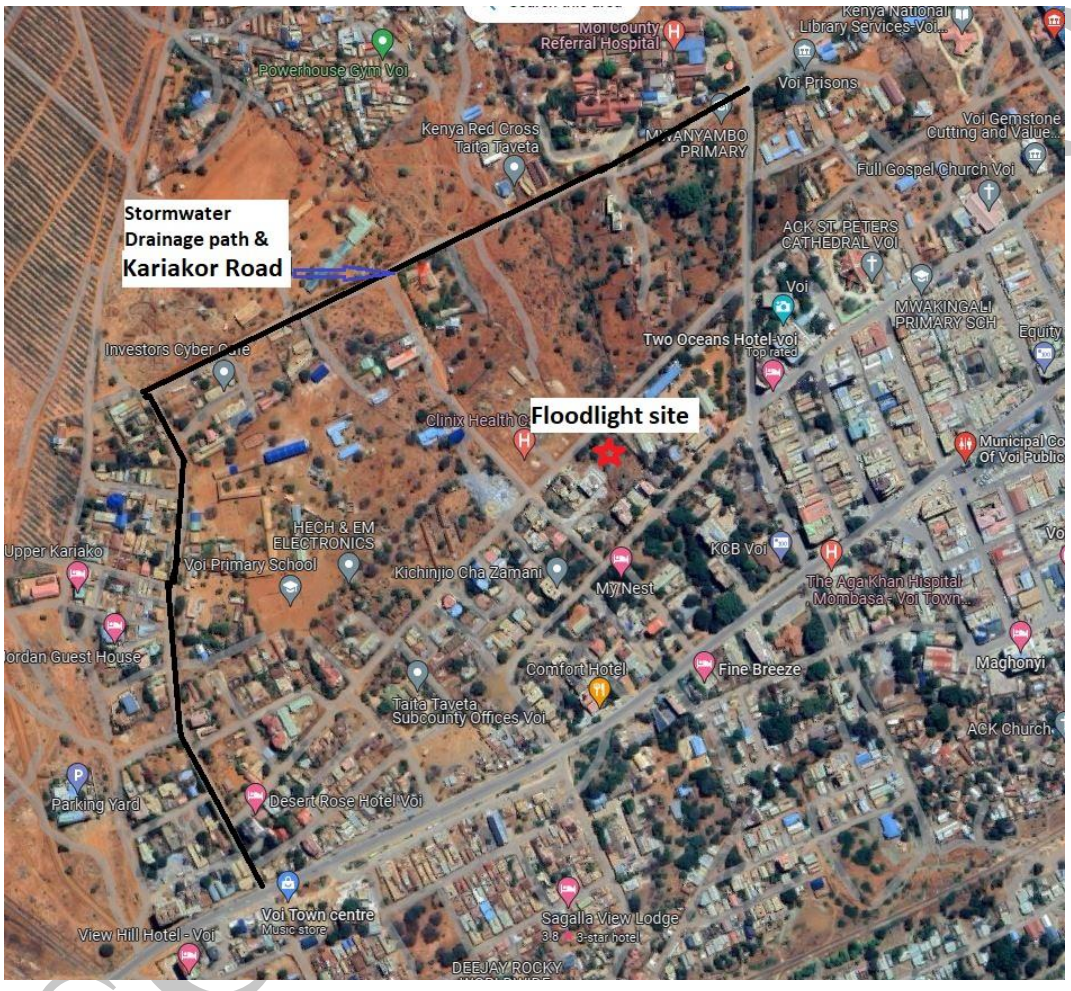


Figure 2: Upper Kariokor settlement project sites (Source: Google map)

2.2 Projects description

2.2.1 Proposed Scope of Works

The proposed projects for the upper-kariokor Settlement encompass a comprehensive upgrade initiative that includes the construction of roads, footpaths, drainage systems, extension of water lines, and streetlight works.

Table 2:Scope of works

Proposed Projects	Description				
	No of Footpaths	No of roads	Widths	Total lengths	Nature of upgrade
4. Roads	-	1	9m	1275m	Upgrade to bitumen standard with side pavements, culverts and crossing paths
5. Drainage system	Description				
	3 Cross pipe culverts and access culverts 4 Lined open and covered drains				
6. Street Lighting- Installation off High Mast lighting	Description				
	No of High Mast lighting		Height		Luminous Radius (Coverage)
	1		30m		150m

2.2.2 Roads and Drainage System

The project's geographical scope extends all through the Upper Kariokor settlement., covering an approximate distance of 1096 meters.

Road Upgrade and Drainage

Table 3:Road Upgrade and Drainage

Road Number	Drawing Reference Name	Road Length (Metres)	Width (m)
Road 01	KISIP 2/TT.TVT/ PP/KARIOKOR ROAD 01	1275	9
Total		1275	

On road reserves 9m wide the **Road works** entail:

Carriage way of 6m width

Pavement structure comprising of;

- 300mm thick improved subgrade compacted in two layers of 150mm to 100% MDD (AASHTO T99)
- 200mm thick Natural Gravel material Sub base, minimum CBR 30%
- 150mm thick 2% Cement Treated Gravel Base
- 35mm thick type II Asphalt Concrete

On road reserves 6m wide the **Road works** entail:

Carriage way of 6m width

Pavement structure comprising of;

- 300mm thick improved subgrade compacted in two layers of 150mm to 100% MDD (AASHTO T99)
- 200mm thick Natural Gravel material Sub base, minimum CBR 30%
- 150mm thick 2% Cement Treated Gravel Base
- 35mm thick type II Asphalt Concrete

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

- Cross pipe culverts and access culverts
- Lined open and covered drains

Design Standards

The proposed roads in the identified settlement are classified as being in an urban setting. The road geometrics, pavement and storm water drainage preliminary and detailed designs will be carried out in conformity with the Ministry of Roads standards as outlined in the Roads Design Manual Part I, III and IV.

Geometric Design

The geometric designs of the project roads were done in such a way that it followed the existing road alignments as close as possible. This was done in order minimize on land acquisition and relocation of the inhabitants of the settlements. Aspects considered in the geometric design include but are not necessarily limited to:

- horizontal alignment,
- Vertical alignment,
- Road cross section
- Junctions
- Road Furniture
- Crossing structures
- Road Drainage

The geometric design was carried out by use of AutoCAD's civil 3D software.

The design has taken into consideration design limiting factors such as encroachments to way leave and zoning or other regulatory restrictions.

Functional characteristics that were considered in the design as per the Urban Roads Design Manual are outlined in the table below:

Table 4: Functional Road Characteristics (Urban Road Design Manual)

No	Function	Local Street
1	Traffic movement	Secondary access
2	Flow conditions	Interrupted flow
3	Design Speed	30 – 40 km/hr
4	Running speed	20 – 40 km/hr
5	Road reserve width	3-9 m
6	Carriageway width	3-6 m
7	Property access	primary
8	Connections	Minor Collectors and local streets
9	Parking	Accepted

Design Speed

The alignment design elements, e.g. curvature, sight distances and vertical grades are directly related to design speed. The selection of the appropriate design speed is therefore an important aspect of alignment design. The design speed for the road was chosen as 40km/hour due to the fact that the roads are basically residential access roads.

Design speed is one factor that determines the degree of curvature in the horizontal alignment design. In this case, the roads are within the residential areas where land development and encroachments to the road reserve are the main factors affecting the horizontal curvature of the design. Therefore, some curves impose low level of comfort to the drivers.

Taking into account the limitations imposed by existing developments on horizontal curves, crest curves and sag curves, the curve radii adopted ranged from minimum of 5m at junctions for turning, to 200m on the curves along the alignment.

Design Vehicles

The design vehicle governing the geometric design is indicated in Table 5 below:

Table 5: Design Vehicle as a Design Control Parameter

Design vehicle type	Overall, m			Overhang, m		Wheel base, m	Minimum design turning radius, m	Minimum inside radius, m
	Height	width	length	front	rear			
4x4 passenger car	1.3	2.1	5.8	0.9	1.5	3.4	7.3	4.2
Single unit truck	4.1	2.6	9.1	1.2	1.8	6.1	12.8	8.5

Design Cross-sections

The typical section was adopted for urban condition taking into account the road reserve width available. The project roads had different road reserve as follows:

- Public roads to the settlement 6 – 9m
- Internal roads 3 - 4 m

The proposed cross sections (provided in the book of drawings) have a carriageway width of **3 -6m** with **1m** shoulders in road reserves of 9m as well as covered drains for additional space to cater for non-motorized traffic.

Alignment

Horizontal and vertical alignments of a road are designed to an optimum balance so as to provide the most direct, practical and economic route flowing with the terrain and with minimum disturbance to the existing route and without compromising on road safety.

The followings assumptions were made during the design of vertical alignments:

- Drivers eye height -1.10m
- Object height for stopping sight distance -0.10m
- Object height for meeting and passing sight distance - 1.10m

The vertical parabolic curves were fitted using the Autodesk Civil 3D software. For each vertical intersection point, the curve was fitted by inputting the required length and balancing with the design speed.

Sight Distance

Minimum stopping sight distance for urban streets ranges from 30 – 60m. Design for passing sight distance is seldom applicable in urban streets.

Table 6: Stopping Sight Distance

Design speed km/h	Brake reaction distance, m	Braking distance on level, m	Calculated stopping sight distance, m	Design stopping sight distance, m
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65

Source: AASHTO Geometric design of highways, Exhibit 3.1

Grades

Grades for informal settlements should be as level as practical, consistent with the surrounding terrain. The gradient adopted for local streets will be less than 15%. Where grades of 4% or steeper are necessary, the drainage design may become critical. For proper drainage, the desirable minimum grade that will be adopted for the access roads with outer curbs will be 0.30%, but a minimum grade of 0.2% may be used.

Cross slope

For efficient drainage, pavement cross slopes should be adequate. The normal travelled cross slopes suggested by AASHTO for both highways and low pavement surfaces are shown in the table below:

Table 7: Normal Travel Way Cross Slope

Surface Type	Range in cross slope rate, %
High	1.5 - 2
Low	2 - 6

Source: AASHTO Geometric design of highways, Exhibit 4.4

High type pavements are those that retain smooth riding qualities and good non-skid properties in all weather

Junctions

Junctions and accesses were provided at required sections. The road is an urban road and therefore, unrestricted access is provided.

Most junctions were for residential accesses, but some were accesses to major and other existing urban roads in the area.

The turning radii provided fit the turning characteristics of passenger car with the minimum being 5m.

Side slopes

The side slopes have been taken as 1:1.5 (vertical: horizontal). According to urban road design manual, suggested slopes for cut and fill conditions are shown in the table below:

Table 8: Recommended Design Slopes

Height of fill or cut, m	Earth slope, vertical to horizontal		
	Flat	Moderately steep	Steep
0 – 1.5	1:4	1:4	1:4
1.5 – 3	1:4	1:3	1:2
3 – 4.5	1:3	1:2.5	1:1.5
4.5 – 6	1:2	1:2	1:1.5
Over 6	1:2	1:1.5	1:1.5

Accesses

Access culverts have been provided to allow for accesses to various plots along the road.

Footpaths

The width of the footpath has been estimated on the basis of minimum width required as 1.2m. However, a width of 2m was adopted due to availability of space. The surfacing is of bitumen standards.

Cycle tracks

Due to volume of traffic projected, cycle tracks have not been provided separately and therefore they will use the same carriageway with other motorized traffic.

Road furniture

Road furniture including road signs, guardrails, speed bumps and miscellaneous furniture were considered in the detailed design.

Roads Operation Phase Activities

This is the phase when the road is actually in use. Most of the activities in this phase will involve monitoring of the activities of the project in line to the objectives of the project. These will include repairs to destroyed areas, expansions, policy development and implementation and general maintenance of the road and the associated structures.

Roads Decommissioning Phase

Decommissioning refers to the final disposal of the project and associated materials at the expiry of the project life span. In respect to the road, decommissioning is not anticipated. However, it will be sustained in accordance to transportation demands of the project area.

Nevertheless, after the construction period, construction equipment and dismantled camp materials will be salvaged and removed from the site by the contractor.

Environmental Protection

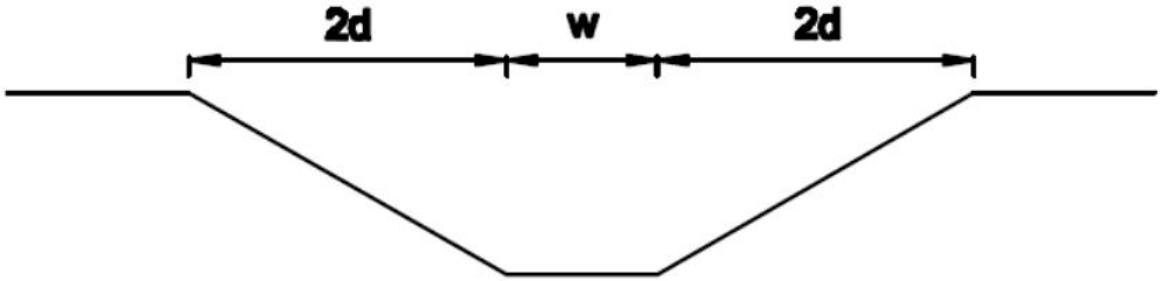
The Contractor is supposed to ensure so far as is reasonably practicable and to the satisfaction of the responsible proponent agent; that the impact of the construction on the environment shall be kept to a minimum and that appropriate measures as brought out in the ESMMP are taken to mitigate any adverse effects during the construction. These measures shall include:

a) After extraction of construction materials, all quarries and borrow pits shall be back-filled and landscaped to their original state to the satisfaction of the Engineer. In particular, those near the project road shall be back-filled in such a way that no water collects in them.
b) Spilling of bitumen, fuels, oils, lubricants and other pollutants shall be avoided and if spilt, shall be collected and disposed of in such a way as not to adversely affect the environment.

Long traffic diversion roads shall be avoided so as to minimize the effect of dust on the surrounding environment. In any case all diversions shall be kept damp and dust free.

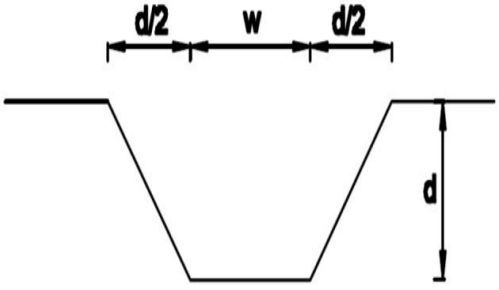
Drainage Facilities Design

Major channels are designed as V-shaped. The major channels run through reserve areas, which are undeveloped areas. The loose slope of the channel is H: V=2:1 which does not require reinforced concrete structure. By adopting this design, construction and management cost can be saved.

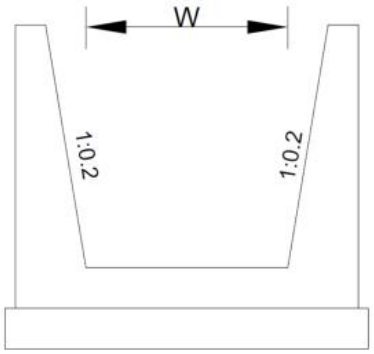


1V-Shape Drain (H:V=2:1)

Meanwhile, side ditches along roads are designed as U-shaped, to provide a large area for roadside land use. The slope of the channel is H:V = 1:1 or H:V = 1:2, depending on their widths. The maximum width of a U-shape drain with slope H:V=1:1 and without reinforcement is 1,000 mm.



2 U-Shape Drain (H:V=1:2)



3U-Shape Drain (H:V=1:1)

2.2.3 Street Lighting Works

The Street Lighting works shall comprise of installation of 1Nr. High Mast lights with a 30 m high steel tower complete with a lockable electrical control switchgear and power meter chamber and 3000mm by 3000mm concrete foundation. Radius of illumination is 150m.

Current State

The targeted road, currently devoid of tarmac, spans approximately 1.96km, exhibiting varied widths of 20M, 15M, 10M, and 9M at different stretches. This diversity reflects the historical evolution of the settlement,

presenting a unique challenge for uniform development. Compounding the complexity, the road has been encroached upon by diverse structures, including houses, stalls, trees, fences, and toilets. These encroachments have collectively contributed to the obstruction of the road, making access to the settlement a formidable task.


Figure 3:Existing infrastructure

2.3 Project Activities and Processes

Projects to be Undertaken;

- Roads and Storm Water Drains
- High mast security lighting

Road and Drainage Construction Activities

The major Works to be executed under the Contract comprise mainly of but are not limited to the following:

- Limited site clearance and top soil removal;
- Earthworks;
- Preparation of the sub-grade to receive the pavement layers as per the standard specifications;
- Provision of cement improved gravel for road sub-base of the specified thickness;
- Provision of cement stabilized gravel for road base of the specified thickness;
- Provision of a double surface dressing using 14/20 mm and 6/10 mm pre-coated class 4 chippings for both the carriageway and the shoulders. The shoulders shall be constructed with the same material and thickness as for sub-base, base and surfacing;
- Construction of culverts and other drainage works;
- Protection works using stone pitching and gabions as necessary;
- Relocation of services as necessary;
- Provision of road furniture, including road marking and traffic signs;

- Landscaping including top soiling and grassing;
- Maintenance of passage of traffic through and around the works.

Any other activity not listed above in either category but deemed to be necessary by the Engineer, shall be subject to the Engineer's formal instructions and within the mode of payment stipulated either by day works or on a measured basis.

Anticipated Waste: Road construction typically generates various types of waste, including excess soil and earthworks material, concrete and asphalt debris, packaging waste from construction materials, and potentially hazardous waste such as oils and lubricants.

Products and By-Products: The main product of road construction is the completed road infrastructure. By-products may include recycled materials from demolished structures or excess materials like soil that can be repurposed.

Waste Management: Waste from road construction can be managed through practices such as recycling concrete and asphalt for use in base layers or new construction, proper disposal of hazardous waste in designated facilities, and minimizing packaging waste through bulk deliveries and reusable containers.

Drainage

Anticipated Waste: Construction of drainage facilities can result in waste like excavated soil and sediment, discarded pipes or culverts, excess concrete or grout, and packaging waste.

Products and By-Products: The products are functional drainage systems. By-products may include materials suitable for reuse or recycling, such as excavated soil for landscaping or recycled pipes.

Waste Management: Waste from drainage construction can be managed through practices like reusing excavated soil for backfilling or landscaping, recycling materials like pipes and concrete, and proper disposal of non-recyclable waste in designated landfills.

Installation of High-Mast lights

The installation of high-mast lights involves several activities to ensure the proper functioning and safety of the lighting system. Below is a list of activities typically involved in the installation process:

- Site Assessment: Conduct a thorough assessment of the installation site to determine the optimal locations for high-mast lights. Consider factors such as visibility requirements, surrounding infrastructure, and potential obstacles.
- Design and Planning: Develop a detailed design plan for the high-mast lighting system, including the height, and the placement of lights. Plan the electrical wiring and power supply for the entire system.
- Foundation Installation: Excavate and prepare the foundation for each high-mast pole according to engineering specifications. Install the anchor bolts and secure the foundation to ensure stability.
- Mast Erection: Use appropriate equipment to lift and install the high-mast poles onto the prepared foundations. Ensure the correct alignment and verticality of each mast.
- Electrical Wiring: Connect the electrical wiring from the power source to each high-mast pole. Install control panels, switches, and other electrical components.
- Light Fixture Installation: Mount the high-intensity light fixtures onto the top of each mast. Ensure proper alignment and secure fastening to prevent movement.
- Testing and Commissioning: Conduct comprehensive testing of the entire high-mast lighting system to ensure functionality. Verify the performance of each light fixture, the power supply, and the control system.
- Establish a maintenance agreement outlining responsibilities and schedules for ongoing upkeep

Anticipated Waste: The installation process for high mast lights may generate waste such as packaging materials, old lighting fixtures, wiring scraps, and possibly excess concrete or foundation materials.

Products and By-Products: The products are the installed high mast lights and improved lighting infrastructure. By-products could include recyclable materials from packaging and old fixtures.

Waste Management: Waste can be managed by recycling packaging materials, properly disposing of old lighting fixtures and wiring in accordance with waste regulations, and reusing or recycling excess construction materials where feasible

2.3.1 Operation Phase Activities

This is the phase when the road is actually in use. Most of the activities in this phase will involve monitoring of the activities of the project in line to the objectives of the project. These will include repairs to destroyed areas, expansions, policy development and implementation and general maintenance of the road and the associated structures.

2.3.2 Decommissioning Phase

Decommissioning refers to the final disposal of the project and associated materials at the expiry of the project life span. In respect to the road, decommissioning is not anticipated. However, it will be sustained in accordance to transportation demands of the project area.

Nevertheless, after the construction period, construction equipment and dismantled camp materials will be salvaged and removed from the site by the contractor.

2.4 Environmental Protection

The Contractor is supposed to ensure so far as is reasonably practicable and to the satisfaction of the responsible proponent agent; that the impact of the construction on the environment shall be kept to a minimum and that appropriate measures as brought out in the ESMP are taken to mitigate any adverse effects during the construction. These measures shall include:

1. After extraction of construction materials, all quarries and borrow pits shall be back-filled and landscaped to their original state to the satisfaction of the Engineer. In particular, those near the project road shall be back-filled in such a way that no water collects in them.
2. Spilling of bitumen, fuels, oils, lubricants and other pollutants shall be avoided and if spilt, shall be collected and disposed of in such a way as not to adversely affect the environment.
3. Long traffic diversion roads shall be avoided so as to minimize the effect of dust on the surrounding environment. In any case all diversions shall be kept damp and dust free.

2.5 Estimated Project Budget

Table 9:Roads budget

BILL No.	DESCRIPTION	AMOUNT
4.00	SITE CLEARANCE AND TOPSOIL STRIPPING	1,283,899.79
5.00	EARTHWORKS	21,617,372.35
7.00	EXCAVATION AND FILLING FOR STRUCTURES	5,774,427.75
8.00	CULVERT & DRAINAGE WORKS	14,653,737.52
9.00	PASSAGE OF TRAFFIC	1,610,160.97

12.00	NATURAL MATERIAL FOR SUBBASE AND BASE	8,889,870.00
14.00	CEMENT AND LIME TREATMENT	2,584,460.21
15.00	BITUMINOUS SURFACE TREATMENT	9,640,993.72
16.00	WEARING COURSE	17,511,114.40
20.00	ROAD FURNITURE	9,695,074.43
	SUB - TOTAL 1	**93,261,111.14**

Table 10:3 No. Street lighting budget

BILL No.	DESCRIPTION	AMOUNT
2.0	FLOODLIGHTING AND OTHER SERVICES	8,976,300
3.0	CIVIL AND STRUCTURAL WORKS	3,399,300
	SUB TOTAL	12,375,600

3. PROJECT ALTERNATIVES

3.1 Project Alternative

Regulation 18(1) of Legal Notice 101 specifies the basic content of an Environmental Impact Assessment Study / Project Report subsequent to which, subsection (i) requires an analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site. Therefore, this section analyses the Project alternatives in terms of site, technology scale and waste management options. However, under this study the alternative that was considered for the Project was focused on:

a) "No-action" Alternative
b) Alternative Routes
c) Alternative Mode of Transportation
d) Analysis of Alternative Construction Materials and Technology

3.2 The "No-action" Alternative

The selection of the "No-action" alternative would mean the discontinuation of all projects designs and result in the site being retained in its existing form. If the site is left undeveloped, the proponent would lose in terms of not achieving development goals. In this case, the road already exists in the type of murram road, therefore there is no standard ''no-action'' scenario if the strategic objectives of the MoM are in constructing the road in bitumen material to improve its standard. There is no other macro-transport alternative like water and overland rail which can be applicable to connect these two towns. The possible alternative is air transport but this is not adequate and affordable to the short distance to be covered and it's not economical.

This is defined as maintaining the road in passable condition. Intermittent repairs are undertaken from time to time. "Without-the-project" scenario is therefore to assume that similar interventions will continue in the future and that the maintenance strategy will be to ensure that the road remains passable. The maintenance strategy may involve environmentally sustainable and friendly mechanisms.

3.3 Upgrade of Roads

3.3.1 Alternative 1: Patch and Repair

Instead of a comprehensive road upgrade, this alternative involves patching and repairing specific sections of the existing roads. It is a cost-effective option but may not address long-term issues.

Pros:

- Cost-effective in the short term.
- Minimal disruption to traffic.

Cons:

- Limited long-term effectiveness.
- May lead to recurring maintenance needs

3.3.2 Alternative 2: Incremental Upgrade

Implement a phased approach to road upgrades, focusing on critical sections first. This allows for budgetary flexibility and minimizes disruptions to traffic and communities.

Pros:

- Phased approach allows for flexibility.
- Minimizes immediate financial burden.

Cons:

- Prolonged disruption as upgrades occur in phases.
- Potential delays in addressing critical road sections.

3.3.3 Alternative 3: New Road Alignment

Consider creating new road alignments or bypasses to alleviate traffic congestion and address issues in a strategic manner, though this may involve acquiring new land.

Pros:

- Addresses traffic congestion strategically.
- Allows for optimized road design.

Cons:

- Land acquisition challenges.
- Higher upfront costs.

Therefore, the incremental upgrade alternative may strike a balance between immediate improvements and long-term considerations. Further detailed analysis is needed to determine the optimal phasing and critical sections for initial upgrades.

3.4 Construction of Storm water Drainage

3.4.1 Alternative 1: Green Infrastructure

Explore the incorporation of green infrastructure solutions, such as permeable pavements and green roofs, to manage storm water naturally and enhance environmental sustainability.

Pros:

- Environmentally sustainable.
- Potential for community engagement.

Cons:

- Initial implementation costs may be higher.
- Requires ongoing maintenance.

3.4.2 Alternative 2: Traditional Drainage Systems

Opt for traditional drainage systems with concrete pipes and culverts. This alternative may be more straightforward but could have higher associated costs and environmental impacts.

Pros:

- Proven effectiveness.
- Standardized construction methods.

Cons:

- Potential environmental impact.
- Limited flexibility in managing storm water naturally.

3.4.3 Alternative 3: Regional Detention Ponds

Implement regional detention ponds to manage storm water runoff at specific locations, providing a more centralized and controlled approach to drainage.

Pros:

- Centralized storm water management.
- Reduces flood risk in specific areas.

Cons:

- Requires significant space.
- Potential impact on existing ecosystems.

Therefore, the selection between green infrastructure and traditional drainage systems depends on the environmental goals and community preferences. Further study on costs and long-term impacts is necessary.

3.5 Installation of High-Mast Lights

3.5.1 Alternative 1: Solar-Powered Lights

Consider the use of solar-powered high-mast lights to reduce reliance on traditional energy sources, promote sustainability, and potentially lower long-term operational costs.

Pros:

- Sustainable and environmentally friendly.
- Potential long-term cost savings.

Cons:

- Higher initial investment.
- Weather-dependent efficiency.

3.5.2 Alternative 2: Smart Lighting Systems

Implement smart lighting systems with sensors and controls to optimize energy usage and adjust lighting levels based on real-time conditions, improving efficiency and reducing environmental impact.

Pros:

- Energy-efficient and adaptable.
- Allows for real-time adjustments.

Cons:

- Initial setup costs may be higher.
- Requires technological expertise.

3.5.3 Alternative 3: Decorative Lighting

Explore the installation of decorative high-mast lights that not only provide illumination but also contribute to the aesthetic enhancement of the area, considering the cultural and visual preferences of the community.

When considering project alternatives, factors such as cost, environmental impact, community preferences, and long-term sustainability should be carefully evaluated. This evaluation process helps decision-makers choose the most suitable and effective approach for achieving the project objectives while mitigating potential negative impacts.

Pros:

- Aesthetic enhancement.
- Community-focused design.

Cons:

- Potential higher upfront costs.
- Balancing aesthetics with functional lighting requirements.

3.6 The Alternative Analysis

The analysis of project alternatives provides valuable insights into various options for the upgrade of roads, construction of storm water drainage, and installation of high-mast lights. The considerations for each alternative are essential in making informed decisions that align with environmental regulations, community needs, and project objectives.

The "no-action" alternative would impede the achievement of development goals for the upgrade of roads, construction of storm water drainage, and installation of high-mast lights. This alternative is not feasible, given the strategic objectives of the projects in Taita taveta town. The alternatives for road upgrades offer a spectrum of choices, each with its own set of advantages and challenges. The road design highlighted appears to strike a balance between immediate improvements and long-term considerations. The alternatives for storm water drainage emphasize the need to balance environmental sustainability with practicality. The selection the designed drainage systems costs effective, and has long-term impacts. The alternatives for high-mast lights present options ranging from solar-powered solutions to smart lighting systems and decorative lighting. The decision-making process involves weighing the benefits of sustainability, efficiency, and aesthetics against the associated costs.

The document underscores the importance of a comprehensive evaluation process, taking into account financial considerations, environmental impact, community preferences, and long-term sustainability. It emphasizes the need for further detailed analysis in certain areas to make well-informed decisions.

Further detailed analysis is recommended for specific aspects, such as the optimal phasing and critical sections for road upgrades, the costs and long-term impacts of storm water drainage alternatives, and the careful consideration of the balance between aesthetics and functionality in high-mast lighting.

The project alternatives analysis provides a solid foundation for decision-makers to choose the most suitable and effective approaches for the identified projects. It reflects a commitment to responsible and sustainable

development, considering the diverse needs and concerns of the community and adhering to environmental regulations.

4. SOCIO-ECONOMIC AND ENVIRONMENTAL BASELINE INFORMATION

4.1 Bio-Physical Environmental Baseline

4.1.1 Physical Environment

4.1.1.1 Climate

Taita Taveta County is one of Kenya's ASAL regions with 89% of the County area characterized by semi-arid and arid conditions. The County is mainly dry, except for the Taita hills which are considerably wet. The effect of the South Easterly winds influences the climate of the County. The County has a bimodal rainfall pattern with two rainy seasons. The long rains occur between March and May with a maximum in April. The short rains take place between October and December. Rainfall distribution is uneven, with the highlands receiving higher rainfall than the lowland areas. During the long rains season, the highlands record an average of 265mm while the lowlands record 157mm whereas, during short rains season, annual rainfall is 1,200mm and 341mm for highlands and lowlands respectively. The annual mean rainfall is 440mm.

In Taita, rainfall fall flows from areas of upper regions to lower regions of Voi. There has been an intensification of extreme precipitation and flood events due to climate change. Extreme precipitation up stream carries large volumes of water that lead to flooding downstream causing a lot of destruction of roads, homestead etc.

4.1.1.2 Rainfall

The long rains are received between the months of March and July while short rains are experienced between the months of October and December. The dry spells are experienced between January and February and also between August and September. Approximately 589 mm | 23.2 inch of rainfall occurs on a yearly basis.

4.1.1.3 Temperatures

The mean yearly temperature observed in Voi is recorded to be 24.1 °C | 75.5 °F. On average, the month of February experiences the highest temperature with an average value of 26.1 °C | 79.0 °F. In July, the average temperature is 22.2 °C | 72.0 °F. It is the lowest average temperature of the whole year.

4.1.1.4 Humidity

The month with the highest relative humidity is December (72.77 %). The month with the lowest relative humidity is February (61.78 %).

4.1.1.5 Soils

There are three types of soil found in voi town Sandy loams; Sandy clay loams; Loam sand soil. Sandy loams are found in large parts of the town. Sandy clay loams are found along River Voi while Loam sand soil is found in areas occupied by the Voi sisal Estate company. The three types of soils are basically less fertile. Voi has a rocky subsoil.

4.1.1.6 Hydrology

In Voi area people use tapped water from Tavevo Water and Sewerage Company Limited. The Only river that exist that passes through Voi town is the Voi river. Its origin is the Taita Hills and locals use it for irrigation of crops among other things. Aruba dam is located on the Voi River, artificially constructed dam that was purposely constructed by the Kenya Wildlife Service as a water reserve source of water to many animals within Tsavo Wildlife Lodge.

4.1.1.7 Wind

The average hourly wind speed in Voi experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 5 months, from May 19 to October 18, with average wind speeds of more than 8.9 miles per hour. The windiest month of the year in Voi is August, with an average hourly wind speed of 11.4 miles per hour. The calmer time of year lasts for 7.0 months, from October 18 to May 19. The calmest month of the year in Voi is March, with an average hourly wind speed of 6.4 miles per hour.

4.1.1.8 Sunshine

In Voi, the month with the most daily hours of sunshine is February with an average of 8.26 hours of sunshine. In total there are 256.19 hours of sunshine throughout February. The month with the fewest daily hours of sunshine in Voi is January with an average of 6.82 hours of sunshine a day. In total there are 211.54 hours of sunshine in January. Around 2726.21 hours of sunshine are counted in Voi throughout the year. On average there are 89.7 hours of sunshine per month.

4.1.2 Biological Environment

4.1.2.1 Flora

The town of Voi, nestled within the expansive Tsavo National Park in Kenya, boasts a rich and diverse flora. The predominant vegetation in most parts of the town comprises sparsely distributed deciduous bushlands and thickets with widely scattered trees. Among the dominant tree species are Commiphora spp. and Acacia tortilis. These deciduous bushlands not only contribute to the aesthetic appeal of the area but also play a crucial role in providing habitat and sustenance for various wildlife species.

Evergreen and semi-evergreen bushlands create a mosaic of vegetation, particularly around the River Voi, streams, and seepage lines. In areas with alluvial soils and deep sandy loam, evergreen forests thrive, adding to the botanical diversity of the region. However, it's essential to note that the described vegetation, while diverse and ecologically significant, may not offer a protective shield against the erosive forces of strong winds and rainfall. This highlights the importance of carefully managing any changes to the landscape to preserve the ecological balance.

4.1.2.2 Fauna

The biological environment of Voi is teeming with a wide variety of fauna, making it a hidden gem within Tsavo National Park. Among the notable wildlife species are elephants, lions, rhinos, leopards, and buffalos – representing the iconic Big Five. Additionally, the local community rears livestock such as cows, goats, ducks, guinea fowl, and chickens, contributing to the dynamic ecological mosaic. Pigeons and doves, along with various other bird species, are part of the avian diversity, adding both visual and auditory richness to the biological tapestry of Voi.

The presence of such a diverse range of flora and fauna underscores the ecological significance of the area. The delicate balance between the natural habitat and human activities is crucial for the well-being of both the wildlife and the local community. Any proposed development, such as the road upgrade, storm water drainage system, and high-mast light installation, must consider the potential impacts on this rich biological environment and incorporate mitigation measures to preserve the flora and fauna.

4.2 Socio-Economic Baseline

4.2.1 Administration

Taita–Taveta County is a county in Kenya. Located approximately 200 km northwest of Mombasa, and 360 km southeast of Nairobi, it is a port and major gateway to the United Republic of Tanzania through Taveta. The county headquarters are located in Mwatate. It is one of the six counties in the Coastal region of Kenya. Its Sub Counties are listed below with respective populations. Upper Kariokor lies strategically within Voi sub county.

Table 11:Sub county populations

Sub county	Wards	Population
Mwatate	5 (Ronge, Mwatate, Bura Chawia, Wusi/Kishamba)	81,659
Taveta	5 (Chala, Mahoo, Bomani Mboghoni, Mata)	91,222
Voi	6 (Mbololo, Sagala, Kaloleni, Marungu,Kasigau,Ngolia	111,831
Wundanyi	4 (Mwanda / Mghange, Werugha, Wumingu / Kishushe, Wundanyi / Mbale)	55,959
Total		*340,671*

4.2.2 Population

The population of Taita Taveta County was 340,671 including 173,337 males and 167,327 females, with population densities ranging from 14 persons per km^2 in rural area to more than 117 persons per km^2 in urban areas[1]. The population distribution in the county is influenced by cultural heritage, rainfall and terrain.
The principal industries in Taita Taveta County are agriculture, livestock rearing, mining, sisal farming and tourism. The county prides in being home to Tsavo East and West National parks with magnificent sceneries, wildlife, birdlife, indigenous forests and rolling volcanic landscape
The study of population size, composition and distribution is important because it determines the provision and distribution of infrastructural facilities such as roads, water, housing, education and health facilities. Voi is the largest town in Taita-Taveta County in southern Kenya, in the former Coast Province
Voi area stands at 111,831 (56115 males 55711 female, intersex 5) Age groups of 0-14 years have 37,286 people, 15-64 have 69,001 people, 65 years and above have 5,539 people. Voi population density is 14.81/Km2. The population size has seen a major increase Population change from 2000 to 2015 +47.1% this can be as a result of immigration of people from other parts of Kenya looking for greener pastures. The population is characterized by people from various tribes Luo, Kikuyu, Meru, Somali, Maasai and many others. Population data is sourced from KNBS population statistics of 2019.

Table 12: Further information about the population structure

Ages	Population
0-9 years	25,098
10-19 years	23,068
20-29 years	20,470
30-39 years	16,389
40-49 years	11,445
50-59 years	7,190
60-69 years	4,681
70-79 years	2,302
80-89 years	910
90+ years	273

4.2.3 Demographics

A total of 60 respondents participated in the survey. A significant proportion of the respondents were 37.5% aged 36-45, between 18-25 years accounted for 12.5% of the total population of people, those aged 46-55 years in this community 2.1%. Also 16.7% of the respondents had attained primary (8 years of schooling) level of education this is quite low levels of formal education.

4.2.4 Household

In Upper Kariakor settlement, 47.2% of the households had between 1 to 5 people who live in one household. *Table 13* shows the distribution of household by gender of household heads and by household size.

Table 13:Further information about the population structure

Household Family Size Characteristic	Proportion, %
Number of usual household members as at the time of conducting the survey	
1-5 people (within KNBS tally, 2022 KDHS Report)	47.2%
6-8 people	36.1%
9+ people (large family size)	16.7%
Total number of household members 19+ years**	100.0%
Total number of adolescents (aged 14 to 18 years)**	58.8%
Total number of children (aged 5-14 years)**	26.8%
Total number of babies (aged 0-4 years)**	23.5%
Average household size	5 persons
Dependency ratio[2]	**73%**

Source: Taita Taveta settlements survey data, 2024.

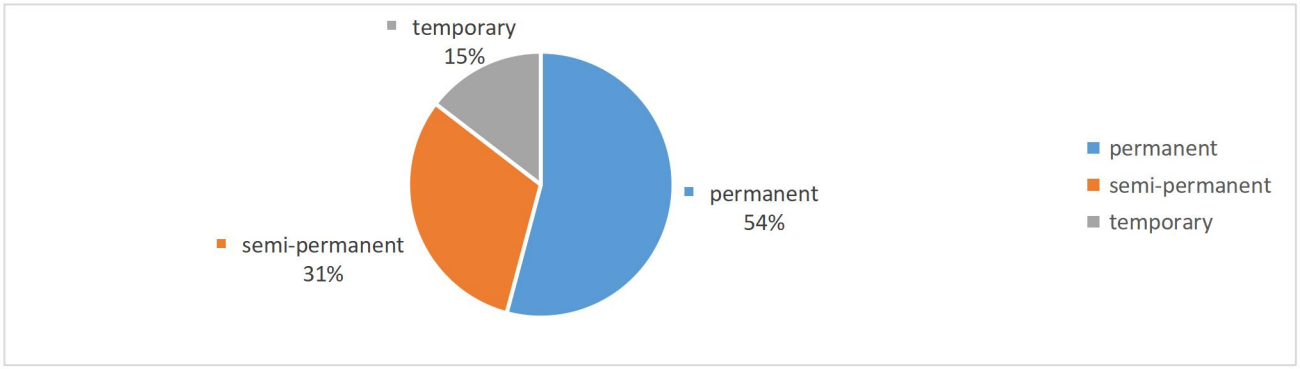
4.2.5 Sources of income

Economic activities are farming and a number of is engaged in fishing as fishermen. These contribute heavily to the local economy both in employment provision and income generation. Most of employment opportunities arise from these main economic ventures. Over 70% of the male adults had one form of employment while 30% female members, had some engagement in some income generating activities (IGAs).

Household structure

Majority, 54% of the respondents live in permanent house structures (i.e. cemented floor; stone wall; and iron sheet roof); while 14.6% lived in temporary makeshift structures *(figure 4)*. The housing situation is satisfactory as even the semi-permanent 31.3% are mostly Swahili houses that are suitable for the coastal region.

Figure 4:Types of house structure



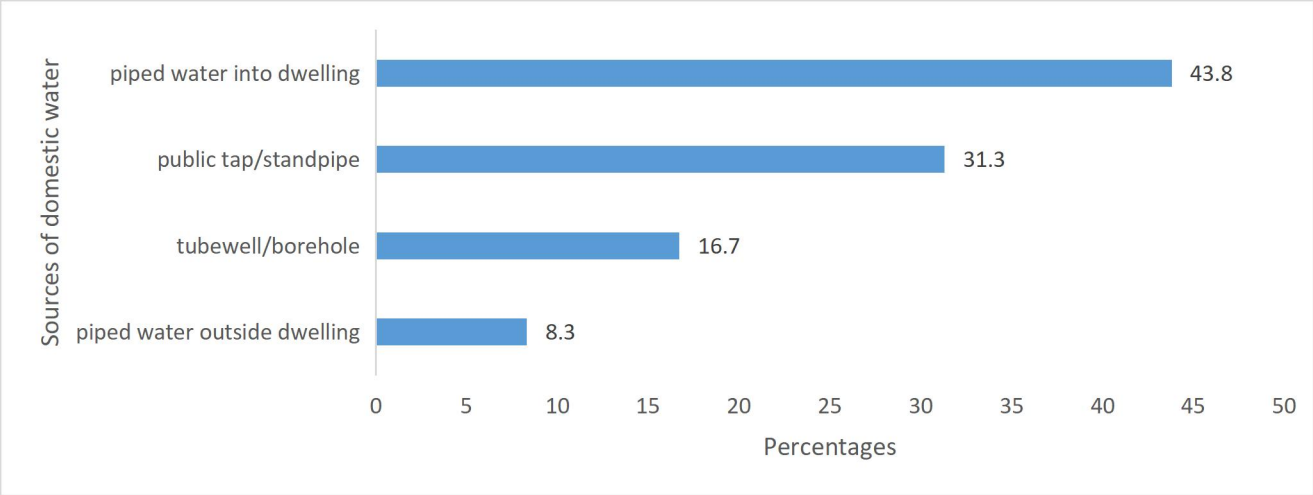
Source: Kariakor Informal Settlements survey data, 2024.

4.2.6 Water

Sources drinking of water

The principal source of domestic water for drinking and cooking in the Kariakor Settlement is piped water into dwelling which accounts for 43.8%, while piped water outside dwelling accounted for 8.3% *(Figure 5)*. Water from unprotected wells is usually used for cleaning purposes.

Figure 5:Profile of the various sources of domestic water



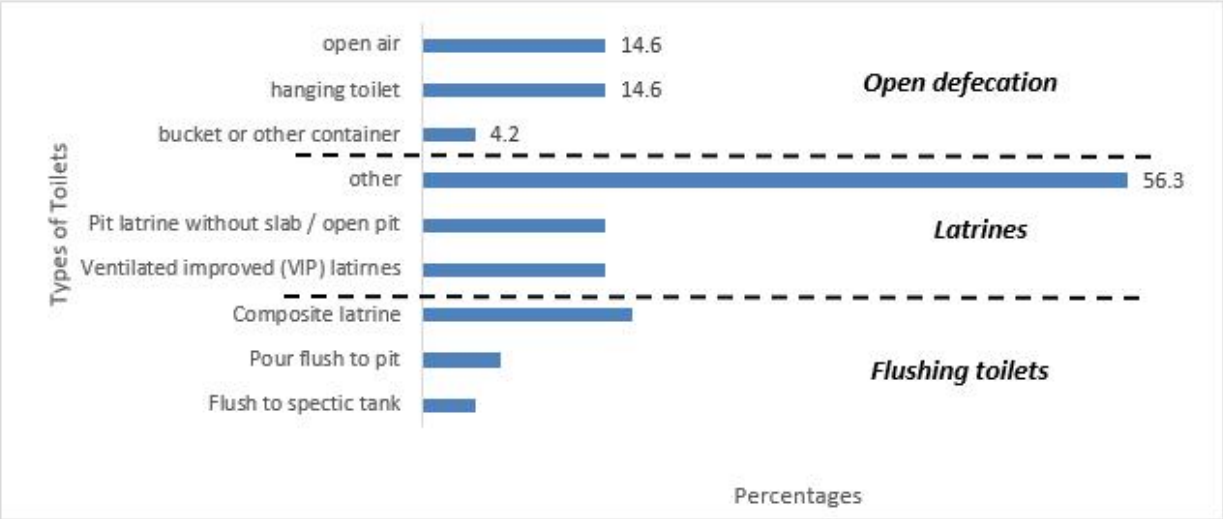
Source: Kariakor Informal Settlements survey data, 2024.

4.2.7 Sanitation

1. Types of toilets

Households that were visited had a toilet facility within the compound, 14.6% reported using pit latrines without slab/open pit as is similar to those using the ventilated improved (VIP) latrines. Others practiced open defecation inform of open air14.6%, hanging toilet 14.6%. The survey established the presence of flush to septic tank toilets in Kariakor Settlements area which account for 4.2% of the responses. *Figure 16* profiles the type of toilets in Upper Kariakor Settlement survey area.

Figure 6:Types of sanitation facilities



Source: Kariakor Informal Settlements survey data, 2024.

4.2.8 Security

1. **Safety in Kariakor Settlement**

In Kariakor Settlement, alcoholism, drug and substance abuse among other unethical behavior contribute to insecurity in the settlement. However, the national government administrators handle crimes as they occur through the national police service collective and interventionist approach to resolving crimes as they occur. This system is intact and well understood by the community members, when need arises the police arrest and take for prosecution and redress measures.

2. **Crime hotspots in Kariakor Settlement**

The leader in the settlement were involved in the mapping of crime hotspots in the settlement. Gangs of youth's attack and rob people at night. Attack. This is along the proposed road 1. Therefore, the contractor will need to be informed of these occurrences, the fact that gangs exist means crime rates will increase especially with the coming in of construction labor force. The hot spots are marked in the GIS map which is a separate out in this project of Kariakor Settlement infrastructure improvement.

4.2.9 Land Tenure

Voi town be divided into 8 broad land use residential land use is the most predominant in the study area. Residential settlements are scattered within Voi. Public utilities and public purposes form the second most dominant land uses in the town. These are also scattered within the town. Commercial land uses are particularly at the town center where Shops, Hotels, Markets, etc. are found. Isolated commercial pockets are found within the Municipality. Transportation, although playing an important role in the town's growth account a small but effective proportion of the total land area.

The industrial land use is not intensive in the town as there are only three major industries and several informal industrial activities. The Educational and recreational land uses form an important part of the town's development. There are adequate number of primary schools. There are only two secondary schools which cater mostly for the town's population.

Land is mainly private property characterized by semi-permanent residential, there also public facilities like hospital and training institutions.

4.2.10 Education Facilities

Education facilities both private and public are within the vicinity which include Voi Primary School, Voi Mainland academy among others.

4.2.11 Public Purpose

Public facilities like hospitals and churches/Mosques are available within the site. River Jordan Hospital, IFC Church, ACK St Johns road among others.

4.2.12 Commercial Activities

There are variety of business operating within Project area Shops, Hotels i.e. View Hill Lodge, Auto Spares dealers i.e. Kariokor Auto Spares, Furniture dealers i.e. Voi roadside furniture', Glass operators, Breakdown services, just to mention a few.

4.2.13 Infrastructure

1. **Roads**

Apart from the main road that diverts from Nairobi Mombasa Highway entering Voi town center, Other access roads available within the project area are marram. Other roads around the town center are also tarmacked.

2. **Electricity**

Kenya Power & Lighting Company supplies electricity to the project areas within Voi.

3. **Communication**

The area is well covered by communication facilities such a Telkom, Safaricom, Airtel among others. All these will facilitate communication during the project cycle.

4. **Sewerage**

All sewerage works and repairs within the project area are done by Tavevo Water and Sewerage Company Limited. Though they face a difficult time in dealing with sewerage issues due to poor sewerage plans that exist for the Voi municipality.

5. **Water Supply**

The general area is served with water supplied by Tavevo Water and Sewerage Company Limited and private boreholes. The developer intends to use water in the project development process from the supplier.

5. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

5.1 National Laws and Regulations

Table 14:National Laws

Law/Regulation	Objective	Application
The Environmental Management and Co-ordination Act, (EMCA) 1999 and amended in 2015 and subsequent Regulations.	Supervision and coordination of all matters relating to the environment	Guidelines for mitigating adverse environmental impacts
The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2003 amended 2019.	Assessing the potential environmental and social consequences/impacts brought about by a project.	Its administration ensures sustainable development and minimizes adverse environmental impacts associated with development projects.
Environmental Management and Coordination, (Water Quality) Regulations 2006	Its objective is to address various aspects of water quality management in order to protect public health and the environment	These Regulations shall apply to drinking water, water used for industrial purposes, water used for agricultural purposes, water used for recreational purposes, water used for fisheries and wildlife, and water used for any other purposes.
Environmental Management and Co-ordination (Waste Management) Regulations, 2006	Its aim is at addressing the challenges of waste management and promoting environmental sustainability.	This policy applies to all categories of waste including hazardous waste and industrial waste. From its generation; collection; transportation; disposal and treatment.
Environmental Management and Co-ordination (Air Quality) Regulations, 2022	Public health protection, preservation of the environment, management of Green House Gases, pollution control etc.	Address various aspects related to air pollution and quality management.
Environmental Management and Coordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulation, 2009	The primary objective of the regulations is to conserve and protect critical ecosystems, recognizing their ecological importance and the services they provide.	Applies to all wetlands, riverbanks, lake shores and sea shores in Kenya regards either private or publicly owned.
Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009	The primary objective is to safeguard the health and well-being of the public, wildlife and the entire ecosystem; by regulating and minimizing exposure to excessive noise and vibration levels.	It states that; no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.
The Kenya Roads Act, 2007	Provided powers and functions of the relevant authorities that manage, develop, rehabilitate and maintain all road projects	Any road upgrade project falls under the purview of this legislation.
Public Roads and Roads of Access Act 1972 revised 2010 Cap 399	Safeguards the right of the public use public roads constructed.	The project entails public road upgrades of the informal sentences

Law/Regulation	Objective	Application
The Traffic Act Cap 403 of 2013	Spells out conditions for use of roads by motorists, among others.	Essential to ensure that traffic flow is maintained during construction.
Occupational Health and Safety Act 2007 CAP 514	Makes provision for the health, safety and welfare of persons employed	The contractor will have to follow this law as he is expected to have employees during the project period.
The Public Health Act 1986 revised 2012 (Cap 242)	Principle instrument for ensuring the health and safety of the people.	Measures need to be placed to ensure the health and safety of the community during the project period.
The Physical and Land Use Planning Act, (PLUPA) 2019	Provides for the preparation and implementation of physical and land use development plans	The legislation provides mechanisms for spatial planning and land use management and addresses the management land resources.
County Government Act No.17 of 2012	The Act empowers the county government to be in charge of function described in Article 186 of the constitution, (county roads, water and Sanitation, Health), Part XI of the Act vest the responsibility of planning and development facilitation to the county government with collaboration with national government	The proponent will work in liaison with Taita Taveta County Government
Urban Areas and Cities (Amendment) Act, 2017.	Denotes the creation of integrated development plan for every county	The proposed project should be integrated in the County Integrated Development plan
National Construction Authority ACT No. 41 of 2011	Encourages the standardization and improvement of construction techniques	The project involves construction activities
Sustainable Waste Management Act 2021	Provide guidelines on solid waste management on project cycle	Mitigate potential solid waste productions during construction stages and the entire proposal on waste management systems
Children Act (2001), revised 2016	Children are being protected from child labour and all forms of violence	Construction camps are likely to interact with children it is mandatory the follow the law to avoid child exploitation. This act also prevents SE
Employment Act, 2007	Aims to regulate the relationship between employers and employees, ensuring fair labor practices and protecting the rights of workers.	This Act shall apply to all employees employed by any employer under a contract of service and shall not apply to; (a) the armed forces; the National Youth Service; and an employer and the employer's dependents where the dependents are the only employees in a family undertaking.
Sexual Offences Act (2006)	Protection of all persons from harm from unlawful sexual acts,	Sexual vices are expected to impact the society and as such a

Law/Regulation	Objective	Application
	and for connected purposes.	law will regulate such Incidences from occurring
The Constitution of Kenya, 2010	The Constitution of Kenya, promulgated in 2010, outlines the fundamental principles and objectives of governance in the country.	Overall, the Constitution of Kenya 2010 has a broad application across various sectors and aspects of governance, providing a foundation for building a just, democratic, and inclusive society.

5.2 County Laws and Regulation

Table 15:County Laws

Law	Objective	Application
Taita Taveta County Climate Change Act 2022	The Act puts in place the framework and mechanisms for mobilization and facilitation of communities and other stakeholders in the county to respond effectively to climate change and for connected purposes.	The project aligns with this act reason it involves construction of storm drains that will be used to control flooding. Flooding is as a result of excessive rainfall caused by climate change

5.3 National Policy Framework

Table 16:National Policies

Policy	Objective	Application
Kenya Vision 2030	Transform Kenya into a middle-income country.	Contribute to the realization of the goals of Vision 2030
The National Environmental Action Plan (NEAP) 1994	Integrate environmental considerations into the country's economic and social development initiatives/plans.	Help in minimizing environmental impacts of project activities.
Policy Paper on Environment and Development 2014	To ensure projects take environmental considerations into account projects take environmental considerations into account	Potential impacts on the environment and involvement of the public in project planning
The National Water Resources Management Policy (1999)	It, calls development of appropriate sanitation systems to protect people's health and water resource from any source of pollution.	Provides measures to minimize the disruption of natural drainage patterns
HIV and AIDS Policy 2009	Setting Minimum Internal Requirements (MIR) for managing HIV and AIDS	The Contractor will in cooperate in tender document and implement HIV awareness initiatives during implementation of the project.
Gender Policy 2011	Mainstream gender concerns	This policy will be referred to during Project implementation especially during hiring of staff to be involved in the project
National Housing policy 2016	Encompasses, rural housing, slum upgrading and vulnerable groups ensuring a long lifespan	The project is dealing with upgrading of informal settlements
Sessional Paper No. 7 of 2005 on National Employment Policy and Strategies for Kenya	Guarantee safe and peaceful working environment	During construction and demolition phase of the project there will be employment.

5.4 County Policy Framework

Table 17:County Policies

Instrument	Objective	Application
Taita Taveta County integrated development goals 2023-2027	Obligates a county to develop an integrated plan, designate planning unit at all County administrative units and promote public participation and engagement by nonstate actors in the planning units.	The project would contribute to the realization of the CIDP's vision for a well-connected and efficient transportation system, thereby supporting broader socioeconomic development goals outlined in the plan.

5.5 Sustainable Development Goals

Table 18:Sustainable Development Goals

Instrument	Objective	Application
SDG Goal 1	No poverty	Through the development of the informal settlement it enhances economic opportunities, improving living conditions, and empowering communities.
SDG Goal 2	Zero Hunger	Road Upgrade improves and other project developments improve access to food, resilience to climate change, environmental sustainability, and social inclusion.
SDG Goal 3	Good health & well Being	The project contributes to the improved health and productivity through the provision of a safe and clean environment.
SDG Goal 4	Quality education	Not Applicable
SDG Goal 5	Gender equality	By considering the specific needs and priorities of women and girls in these communities during the project phases
SDG Goal 6	clean water and sanitation	infrastructure improvement within the settlement can contribute to advancing the broader objectives of sustainable water management, sanitation access.
SDG Goal 7	Affordable and clean energy	The project entails the sustainable usage of energy to power the high mass lights and other operations of the project.
SDG Goal 8	Decent work and economic growth	Employment creation that will contribute to reducing the proportion of youth not in employment.
SDG Goal 9	Industry, Innovation and infrastructure	Through infrastructure development of the settlement it promotes resilience, inclusivity, sustainable development, and innovation within the community.
SDG Goal 10	Reduced inequalities	Services provided by each project infrastructure is intended to be accessible to all for example the

Instrument	Objective	Application
		roads constructed.
SDG Goal 11	Sustainable cities and communities	The proposed project plans to improve/develop informal settlements of Upper Kariokor Taita Taveta county.
SDG Goal 12	Responsible consumption and production	Its indirectly applicable through considerations such as waste management, pollution prevention, and Use of resources sustainably impacts on coastal communities.
SDG Goal 13	Climate action	Integrating climate action principles into the informal settlement upgrade project aligns with SDG Goal 13's objectives by mitigating climate change.
SDG Goal 14	Life below water	The drainage of the storm water puts into consideration the aquatic life.
SDG Goal 15	Life on land	Implementing Sustainable development and environmental conservation into the design and implementation of infrastructure projects in informal settlements helps achieve SDG 15.
SDG Goal 16	Peace justice and strong institutions	Through the development of the informal settlement it enhances economic opportunities, improving living conditions, and empowering communities.
SDG Goal 17	Partnerships for the goals	Road Upgrade improves and other project developments improve access to food, resilience to climate change, environmental sustainability, and social inclusion.

5.6 Multilateral Environmental Agreements

Kenya is signatory to several international conventions and treaties that would need to be adhered to in implementing this project and are geared towards environmental protection and conservation. Some of these include;

- ILO Conventions ratified by Government of Kenya
- Safety and Health in Construction Recommendation, 1988
- United Nations Framework Convention on Climate Change
- United Nations Convention on Biological Diversity (UNCBD)

United Nations Framework for Convention on Climate Change (UNFCCC)

The convention addresses the principles of common but differentiated responsibility and precautionary action. Its main objective is to achieve the stabilization of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with climate systems and within a specific timeframe which will allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. Kenya signed the Kyoto protocol to the UNFCCC in 1997 which provided limitations and reduction commitments for developed countries and those in transition. Kyoto Protocol to the United Nations Framework Convention on Climate Change aim is to reduce or limit the emission of gases contributing to the "greenhouse effect" and causing climate change in the industrialized countries. United Nations Framework Convention on Climate Change (UNFCCC) aim is to achieve stabilization of greenhouse gas concentrations. The Paris climate change agreement goal is to limit global warming to well below 2, preferably to 1.5 degree Celsius, compared to preindustrial levels.

Vienna Convention for the Protection of Ozone Layer

Inter-governmental negotiations for an international agreement to phase out ozone depleting substances concluded in March 1985 with the adoption of this convention to encourage intergovernmental co-operation on research, systematic observation of the ozone layer, monitoring of CFC production and the exchange of information. Therefore, both the proponent and the contractor are obliged to minimize or phase out the generation of CFCs into the atmosphere during the project cycle.

Convention on Biological Diversity (1992)

The convention promotes the protection of ecosystems and natural habitats, respects the traditional lifestyles of indigenous communities, and promotes the sustainable use of resources. The project activities especially during construction will impact negatively to the flora and fauna of the respective construction areas. As such both the proponent and the contractor must ensure that the activities of the proposed project do not affect the immediate ecosystems negatively and that the livelihoods of the local people are not negatively affected but rather enhanced.

African Union- Agenda 2063

"A prosperous Africa based on inclusive growth and sustainable development" requires that Africa makes significant investments in education with the aim of developing human and social capital through an education and skills revolution emphasizing innovation, science and technology.

African Charter on the Rights and Welfare of the Child.

It calls for protection against abuse and bad treatment, negative social and cultural practices, and all forms of exploitation. Article 2(5) & (6) of the Constitution ratifies international treaties and conventions to form part of Kenyan law.

Montreal Protocol on Substances that Deplete the Ozone Layer (1987)

The Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in 1987 and enforced in 1989, stands as a testament to the global commitment to safeguard Earth's delicate ozone layer. This monumental international agreement signifies a decisive move to tackle the urgent issue of ozone layer depletion by recognizing the imperative need to regulate and control the production and emission of ozone-depleting substances (ODS). The primary objective of the Montreal Protocol is to protect the ozone layer by implementing precautionary measures to mitigate global emissions of ODS. This objective entails a comprehensive strategy to address ozone depletion, acknowledging the pivotal role of the ozone layer in shielding life on Earth from the harmful effects of ultraviolet (UV) radiation originating from the sun.

5.7 World Bank Operational Safeguards

Table 19:World Bank Safeguard Policies

Instrument	Objective	Application
Operational Policy (OP)/Bank Procedure (BP) 4.01, 2001	Environmental Assessment	The project was identified as a Category B
World Bank Safeguard Policy BP 17.50, 2001	Public Disclosure	The proposed project incorporated public participation and stakeholder consultation
World Bank's Operational Policy (OP) 4.12 on Involuntary Resettlement	Assessment of displacement of individuals where a project is being implemented.	The World Bank's Operational Policy (OP) 4.12 on Involuntary Resettlement outlines guidelines for projects that may result in the displacement of people or the loss of assets.
World Bank's Operational Policy (OP) 4.11 on Physical and Cultural Resources	Identification and assessment of potential impacts on physical and cultural resources during project preparation	Outlines the institution's commitment to promoting sustainable development while safeguarding physical and cultural resources affected by Bank-financed projects.
World Bank's Access to Information, 2015 (Amended)	To enhance transparency, accountability, and stakeholder engagement in Bank-financed projects.	Applied to all WB projects.
World Bank's Environmental Health and Safety Standards	Ensures that the projects it finances are environmentally and socially sustainable, and that they adhere to high standards of safety and health.	Applied to all WB projects.

5.8 KISIP 2 Instruments

Table 20:KISIP Instruments

Instrument	Objective	Application
Environmental and Social Management Framework	Ensure that any adverse environmental and social impacts are avoided or appropriately mitigated and compensated for where necessary.	The project has anticipated impacts to the environment thus there is need to implement this framework to control these impacts.
Resettlement Policy Framework, 2023	RPF be prepared for all projects that anticipate both physical and livelihood displacement.	An ARAP is to be subjected to the project if the project affected people are less than 200. If the PAPS are more than 200 a There were displaced persons though they were less than 200
Stakeholder engagement framework 2023	Describe the applicable regulatory and/or other requirements for disclosure, consultation and engagement with the Project's stakeholders;	Public consultations were conducted as per the framework.

6. PUBLIC PARTICIPATION

6.1 Objectives of The Consultation and Public Participation (CPP)

The objective of the consultation and public participation was to:

1. Disseminate and inform the stakeholders about the project with special reference to its key components and location.
2. Gather comments, suggestions and concerns of the interested and affected parties.
3. Sensitize the community on the project
4. Incorporate the information collected in the ESIA study

6.2 Schedule of Stakeholder Consultations

The assessment involved consultations with relevant stakeholders in target Project area. The aim of stakeholder consultations was to give a platform for information sharing and opinion gathering in relation to the proposed Project. Consultations were done in form of key informant interviews, with questionnaires, which were filled and signed as shown in **Annex 2**. The area local administration together with the Settlement Executive Committee (SEC)and Grievance Redress Committee (GRC) combined efforts to reach out to the vulnerable through their organized groups/associations existing in the settlement.

Taita Taveta County Environmental Officer and County Physical Planning Officer were interviewed regarding the proposed project and the results of the interviews annexed.

The issues were than analyzed and presented to design team for finalization of Project designs and planning on how best to implement the Project.

Table 21: Schedule of Public Consultation Meetings

Meeting	**Date**	**Participants**	**Gender**	
			Male	Female
Technical Consultative Meetings (At Desert Rose Hotel, Voi)	27th November 2023	Taita Taveta County KISIP Coordinator, County Survey Department, County Planning Department, County Lands Department, Health Department, Kenya Red Cross, Social Services Department, Water Department, Ward administration, village administration, and Consultant	12	8
Grievance Redress Committee and Settlement Executive Committee Meetings (At CDF Office, Voi)	28th November 2023	County KISIP Team, County Survey Department, County Planning Department, County Lands Department, Health Department, Kenya Red Cross, Social Services Department, Water Department, Ward administration, village administration, GRC and SEC members, and Consultant	18	24

Public Meetings/Barazas - Kariokor Public Meetings	29th November 2023	County KISIP Team, County Survey Department, County Planning Department, County Lands Department, Health Department, Kenya Red Cross, Social Services Department, Water Department, Ward administration, village administration, GRC and SEC members, Consultant, community members	25	29

Table 22: Summary of Stakeholder Consultation Issues

S No.	Concern/Comment/Question	Response/Recommendation
1	A member of the community stated that the local administration as well as the police should be in charge of the streetlights to avoid vandalism.	This was noted and proposed to the local administration for action. The streetlights will always be monitored by the local police with the help of the locals.
2	The community requested that demarcation should be done to determine the extent of encroachment and KISIP environmental experts made an assurance that they will fulfil the desire of the community members.	A surveyor has been commissioned by the county to establish the extent of the encroachment by putting up beacons on the road sides.
3	The community requested fairness when it comes to recruitment process. They stated that people with disabilities should also be considered during recruitment process. The consultant's sociologist acknowledged the idea and made a commitment to the community that vulnerable people will also be considered.	The 75% policy will be adopted, as 75% of the project employees, both skilled non skilled will be used during this project. 1/3 of the population will be women for the sake of gender balance as well as PWDs. The consultant's sociologist acknowledged the idea and made a commitment to the community that vulnerable people will also be considered.
4	The community requested that all roads next to learning institutions should have bumps and walkways. The KISIP environmental experts made an assurance that bumps and walkways will be included in their road design.	The KISIP environmental experts made an assurance that bumps and walkways will be included in their road design.
5.	The community requested that training on road safety should be offered to members within the settlement. The consultant's sociologist made an affirmation that all trainings would be done including the HIV/AIDS training once the construction work commences.	The consultant's sociologist made an affirmation that all trainings would be done including the HIV/AIDS training once the construction work commences.

6.	The community members requested they be constructed a receptacle if there will be extra funds remaining. KISIP acknowledged their desire and promised to honor it.	KISIP acknowledged their desire and promised to honour it

The Upper Kariokor community are willing for the project to be rolled out and implemented immediately with less impacts to the community.

6.2 Notification of the Marginalized

The marginalized where notified through the Taita Taveta County Officer from the respective ministry. The county officer communicates with the SEC Committee chairperson, who the informs the rest of his/her members. The SEC/GRC committees then inform the marginalized.

6.3 Stakeholder consultation issues

1. **Employment**: This is a key benefit of any project that host communities can gain from a proposed project during construction phase and at operation phase. They thus expressed the need for the proponent to observe the following with regard to employment. Those responsible for project implementation ensure that youth from the area are given priority (60-70%) in recruiting labour force. While recruiting employees during the operation phase there is need to consider local population skilled in various issues.

2. **Project Implementation**: Given the immense benefits that the proposed project will produce, the community members urged the proponent to hasten so that the community can start benefitting from it. Those living in towns are especially very keen on the transportation aspect on their environment on storm waste water management, and street lighting.
3. **Manual labour**: Community suggested that as much as is practically possible, machinery should not be used where manual labour can be used to increase employment opportunities for the community.

4. **Reduced pollution**: The residents living around the project location felt that regular sprinkling of water and road maintenance will help curb the problem of air pollution by dust emission during construction and from potholes. The major source of pollution for the environment was identified to be dust emissions. This has led to loss of aesthetic value of the environment. The proposed project if implemented and operated as envisioned will arrest this pollution.

5. **Participation in the life of the community**: The proponent has become part and parcel of the local community. There is thus need to fully participate in the life of the local community in improving the life of the people.
6. **Remuneration**: Contractors should be advised not to underpay local people who will be employed on casual basis.

7. **Open communication**: To avert unnecessary conflicts, there is need for prompt communication to all stakeholders. This could be through the use of the local administration and any information or clarification about stakeholders' position on project need to be promptly availed to any interested party. Any complaints need to be handled through the structured grievance redress mechanism as presented in this report.

8. **Project acceptance and support**: There was a near unanimous support for the proposed project. This was as a result of clear explanation of what is proposed and the way forward in the implementation process. The community understood that the project is feasible in all aspects. In addition, the project will spur growth in the area. The local administration indicated that he and the entire community would support the project as

long as it promoted development in the area. The community has no objections for the project since there are similar projects in other parts of the country that have benefited the residents.

9. **Compensation:** The community from Upper Kariokor settlement expressed a concern regarding the compensation for marked houses set for demolition. This indicated a need for a robust Compensation and Abbreviated Resettlement Action Plan (ARAP). The ARAP outlined clear and fair compensation mechanisms for affected households, ensuring that those losing their homes due to the project are adequately compensated. The compensation package took into account the market value of the properties, any associated relocation costs, and other related expenses.

6.4 Stakeholders concerns

The following is a summary of concerns that were raised by the consulted stakeholders regarding implementation of the proposed project;

A. Positive Comments made by the Stakeholders

The following section provides details on the positive impacts of the proposed project as expressed by the stakeholders who interviewed:

i. Creation of Employment Opportunities

The respondents who were interviewed consulted were optimistic that the project will create numerous employment opportunities for both for skilled and unskilled labor alike during the construction and operational phases. Despite the fact that most of the project will need skilled labor force during operation, people expressed hope that they will be able to access employment once the project commences mostly as casual workers. The respondents were also optimistic that they will take up relevant training to take up jobs during operation stage. Job opportunities will arise at vehicle maintenance garages along the project location. These will be sources of income for several individuals and households and hence is expected to boost the GDP and improve the living standards of Kenyans.

ii. Increased Business Opportunities

The respondents were optimistic that there will be an increase in business opportunities during the construction and operation along the road. Small scale business people such as food vendors and kiosk owners will benefit greatly during construction. Once the construction of the road is complete, the existing commercial premises will be economically revitalized.

The new road will also lead to the expansion of various businesses located along the road. There is in particular high possibility of expansion of petrol stations, hotels and restaurants, shopping malls, etc. due to increased number of motor vehicles (and people) using the route.

iii. Cheap and Faster Means of Transport

The respondents were positive that the proposed road will provide a faster and cheaper means of transport for cargo trucks, passengers and personal cars. This will improve the current transport situation along the road.

iv. Easy and Fast Movement of People

The public was positive that the road will reduce the travel time of people within the stretch. They also said that the road will lead to an increased number of transport providers such as tuktuk and bodaboda operators hence making transportation easy.

v. Transfer of Skills

The members of the public suggested that with the road being a source of employment. Many different skilled workers will be employed from within and without the area. This will lead to a transfer of skills and gaining of experience during the construction period.

B. Negative Concerns of the Stakeholders

i. Noise pollution

There was concern over the possibility of high noise and vibration levels at the project site as a result of excavation, construction and demolition works. The source of noise pollution will include, transport vehicles, construction machinery, metal grinding and cutting equipment, among others. Excavations will also cause vibrations. However, the proponent will take appropriate steps to minimize noise pollution through provision of appropriate protective equipment to construction workers, planning and minimizing the frequency of transporting construction materials and ensuring that all construction machinery and equipment are well maintained.

ii. Dust Generation

The public expressed concerns over possibility of generation of large amounts of dust within the project site and surrounding areas as a result of demolition, excavation works and transportation of building materials. The proponent will thus need to ensure that dust levels at the site are minimized as much as possible through sprinkling water in areas being excavated and, on the access, roads used by the transport trucks within the site. Additional mitigation measures presented in this report will need to be fully implemented to minimize the impacts of dust generation.

iii. Loss of Vegetation Cover

Members of the public expressed concerns that during the construction phase of the project there will be clearance of vegetation along the corridor. Also, the clearance of vegetation will have impacts on the soil particularly increased soil loss which subsequently may impact on the water quality and ecosystem productivity. Most of the respondents proposed that a major landscaping and tree planting should be carried out along the road in order to restore the scenic beauty of the environment.

iv. Road Accidents

The residents along the road expressed fears that the new road will allow vehicles to move at high speed and this may increase the number of road accidents. The project proponent will need appropriate pedestrian crossing points with bumps and zebra crossing and if possibly construct foot bridges in certain key areas.

v. Increase in the spread of STD, HIV and AIDS

The residents along the proposed road corridor expressed concern that there would be an increase in incidences of sexually transmitted diseases including HIV and AIDS especially during construction of the road as a result of increased prostitution. The project proponent will need to work jointly with appropriate county and county government public health agencies in order to come with a comprehensive STD, HIV and AIDs control programme during the construction and operational phases of the project.

6.5 Inclusion of Outcomes of Stakeholder Engagement in the Final Design of the Project

Employment Opportunities for the Public

The Stakeholder Engagement identified the need to provide employment opportunities to the local community members during project implementation period as the main concern from the community.

The project will provide employment opportunities for the estimated number of locals at 60%

The opportunities will be shared equally throughout the Project Areas and as provide by Gender Policy 2011 discussed in chapter 4.

Improved Road Infrastructure, Drainage and Solid Waste Collecting and Disposal

The Stakeholder Engagement identified the need for improved these areas major community concerns in the target Project area. The project will result in improved transportation, storm water drainage and solid waste collection and disposal points.

Public Health and Safety

The public were concerned about health and safety risks that are likely to be triggered by the project. Specific risks were traffic risks of workers and community members during road crossings, occupational health and safety issues related to dust, noise and excessive vibrations and general health and hygiene.

The Contract Specifications (Clause 141 and 142 of the Specifications) have included a chapter on Contractor's compliance with Environment Health and Safety as outlined in the ESMMP prepared for the project. An item has been included in the Preliminaries and General Items Bill of Quantities for the Contractor to price for all costs for compliance with the specified requirements on environment health and safety.

Other public health concerns were contraction of diseases due to the decomposing solid wastes which could be toxic. Safety gears including PPEs would be provided to workers on the waste pillages to prevent this risk.

6.6 Public Disclosure of ESIA, RAP, CPR and Annual Monitoring Reports

In accordance with EMCA 1999 and amendment 2015 and World Bank OP 4.01, the Project Proponent in this case PROJECT OPERATOR will ensure that the Results of Public Consultations including ESIA area disclosed on WSP website.

The Reports will also be made available at Chiefs' Offices in the affected Locations for ease of access by the project interested parties at location level and Project site office, the local Chiefs offices.

This disclosure will be done early before commencement of Project Works, 60 days before Contractor's mobilization on site. In addition, PROJECT OPERATOR will ensure that the ESIA Reports are available throughout the project area. During the disclosure period, interested and affected parties will submit their final comments and concerns about the Reports.

The Reports and information will also be disclosed at the ESIA Stage by NEMA and during Project Implementation Stage by PROJECT OPERATOR. NEMA will require PROJECT OPERATOR to undertake a closeout audit after completion of the project and also undertake and initial Environment Audit (EA) immediately after commissioning of the project in the 1st year, these audits are essential in determining the performance of the project in addressing issues related to environment and social safeguards, gaps identified are corrected through implementation of recommendation of the Environment and Social Audit Action Plan (ESAAP).

6.7 Construction, Operation and Decommissioning Phase Consultations

Stakeholder groups that may be affected by and/or interested in the implementation of the Project, as well as proposed communication methods and media for each group, have been identified and are presented in the **table** below.

Table 23:Stakeholder Consultations during Project Construction and Operation Phase

Stakeholder/s	Type of communication	Responsibility	Timing
External Stakeholders			
Project Affected Persons	Public meetings and monthly project progress updates	Contractor / PROJECT OPERATOR	Throughout project implementation phase
Local administration representatives, Chiefs and Ward Representatives	Public meetings and monthly project progress updates	Contractor / PROJECT OPERATOR	Throughout project implementation phase
Interested NGOs and other civil societies	Local media (newspapers) ESIA, published on PROJECT OPERATOR, website.	Contractor / PROJECT OPERATOR	Throughout the implementation of the Project
Relevant National Government and County Government Authorities for example: KURA, Kenya Power	Official correspondence and meetings, progress reports Permitting procedures	Contractor / PROJECT OPERATOR	During project design, construction and implementation
Kenya National Museums due to chance find clause of OP 4.11 on physical cultural resources	Official correspondence and meetings Permitting procedures	Contractor / PROJECT OPERATOR	During project Construction phase
Internal Stakeholders			
Employees (Contractor, PROJECT OPERATOR)	Notice boards, email, Grievance Redress Mechanism, meetings	Contractor / PROJECT OPERATOR	Throughout project implementation phase
Casual workers and temporary staff	Notice boards, email, Grievance Redress Mechanism, meetings	Contractor	Throughout project implementation phase

6.7.1 Community Relations in Construction Phase

This section set outs the proposed objectives, mechanisms and responsibilities for liaison with Project beneficiaries during the construction phase. It identifies the approach to, and frequency of, consultation with Project beneficiaries.

The primary responsibility for liaison will be borne by the construction contractor, and PROJECT OPERATOR will therefore require the contractor to develop its own plan and more detailed proposals for community liaison. This will build on the approach outlined in this section. All potential contractors will be required to draw up this plan as part of the tender process.

The objectives of the Community Relations Programme will be to:

- Provide local residents with regular information on the progress of work.
- Inform the project/contractor of any community related issues that may impact construction.
- Monitor implementation of mitigation measures and the impact of construction via direct monitoring and feedback from Project area.
- Identify any significant new issues that may arise during the construction period; and
- Manage any complaints against the project/contractors and local residents (i.e., provide a grievance mechanism).

6.7.2 Construction Contractor's Role in Community Liaison

The Construction Contractor will be required to adhere to the requirements of the Environmental and Social Management and Monitoring Plan (ESMMP) that sets out how the contractor will meet and monitor the mitigation measures recommended by the Plan. The role and responsibilities of the Contractor include:

- Provide primary interface between project and affected or interested persons;
- Coordinate and implement required pre-construction activities, namely;
    - produce management plans for community relations, construction camps and transport; train staff with community relations responsibilities; and
    - implement induction training workshops for all construction staff;
- Assist in local recruitment process; and
- Ensure on-going communication with project and affected or interested persons

6.7.3 Community Relations in Operational Phase

The objective of the Community Relations Programme in this Phase will be to:

- Maintain constructive relationships between local residents and the water operators, to assist in the operation of the facilities;
- Maintain awareness of safety issues among local residents in the project areas;
- Ensure compliance with land use constraints among land owners in the project areas;
- Monitor community attitudes to the water infrastructure and to the operator, PROJECT OPERATOR

6.7.4 Decommissioning

In the event of decommissioning of the Project, liaison will continue to take place between PROJECT OPERATOR and with Project Affected or Interested Persons prior to de- commissioning. This role will complement work carried out by the operating company and social investment team to reduce the negative impact of the project decommissioning.

7. IDENTIFICATION OF ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

Environmental and Social Impact Identification and Analysis/Rating

The identification and assessment of environmental and social impacts is a multi-faceted process, using a combination of quantitative and qualitative descriptions and evaluations. It involves applying scientific measurements and professional judgement to determine the significance of environmental impacts associated with a proposed project. Other potentially significant impacts or those of stakeholder concern, the impact identification and evaluation process.

The identified Impacts were categorized as negative and positive. Further, negative impacts were analyzed based on impacts consequence and impacts likelihood as shown on Table 7 and Table 8 below. Similarly, impacts rating was determined based on impacts consequence and impacts likelihood as shown in Table 9 and Table 10. Impacts prediction was made during the construction and the operation phases of the proposed projects. Mitigation measures were thereafter proposed with the hierarchy of avoidance, minimization, mitigation and offsetting the impacts.

Table 24: Impacts Consequences

Severity / Magnitude of Impact	Rating	Spatial Scope / Geographic Extent of Impact	Rating	Duration of Impact	Rating
Insignificant / non-harmful	1	Activity specific	1	One day to one month	1
Small / potentially harmful	2	Area Specific	2	One month to one year	2
Significant /slightly harmful	3	Whole Site	3	One year to ten years	3
Great / harmful	4	Regional/Neighboring areas	4	Life of operation	4
Disastrous / Extremely harmful	5	National	5	Post closure / permanent	5

Note:
Total Rating of Impact Consequence = Rating of Severity/Magnitude + Rating of Spatial Scope of Impact + Rating of Impact Duration

Table 25: Impacts Likelihood

Frequency / duration of activity	Rating	Frequency of impact	Rating
Annually or less	1	Almost never / Impossible	1
6 monthly / temporary	2	Very seldom / highly unlikely	2
Monthly / infrequent	3	Infrequent / unlikely / seldom	3
Weekly / life of operation	4	Often / regularly / likely / possible	4
Post closure	5	Daily / highly likely / definitely	5

Total Rating of Impact Likelihood = Rating of Frequency/Duration of Activity + Rating of Impact Frequency
The definitions used in the impact assessment are given below:

- **Frequency of activity** refers to how often the proposed activity will take place.
- **Frequency of impact** refers to the frequency with which a stressor (aspect) will impact on the receptor.
- **Severity** refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.
- **Spatial scope** refers to the geographical scale of the impact.
- **Duration** refers to the length of time over which the stressor will cause a change in the resource or receptor.

Table 26: Significance Rating Matrix

Consequence (Magnitude+ Geographic extent + Duration of the Impact)						
Likelihood (Frequency of Activity + Frequency of Impact)	1	2	3	4	5	6
	2	4	6	8	10	12
	3	6	9	12	15	18
	4	8	12	16	20	24
	5	10	15	20	25	30
	6	12	18	24	30	36

Note:
Rating of Impact Significance = Rating of Likelihood X Rating of Consequence

Table 27: Negative Impacts ratings and associated colour codes

Significance rating	Value	Colour Code	Negative Impact Management Recommendation
Very high	30 and above		Propose mitigation measures
High	25-29		Propose mitigation measures
Medium high	19-24		Propose mitigation measures
Low medium	12-18		Maintain current management
Low	8-11		Maintain current management
Very low	4-7		Maintain current management

7.1 Anticipated project positive impacts During Pre-construction Phase

7.1.1 Roads & Drainage

Inclusivity in decision making

Diversity and inclusion practices may be of massive impact on project performance. Having a decision making system that is not bias and is largely transparent to the stakeholders and the community at large may lead to project acceptance.

Enhancement

This impact could be enhanced by ensuring all members of the community are well represented and consulted through all the phases of the project.

Employment for surveys especially enumerators

The project is predicted to create employment for the locals in the community as there will be people who would be employed as enumerators for the project during the preconstruction stage of the project.

Enhancement

As a positive impact, it can be enhanced through ensuring equity in the hiring criteria, considerations given to the 2/3 gender rule. The other vulnerable people like the disabled should also be considered during this project.

7.1.2 Street lighting

Inclusivity in decision making

Diversity and inclusion practices may be of massive impact on project performance. Having a decision making system that is not bias and is largely transparent to the stakeholders and the community at large may lead to project acceptance.

Enhancement

This impact could be enhanced by ensuring all members of the community are well represented and consulted through all the phases of the project.

Employment for surveys especially enumerators

The project is predicted to create employment for the locals in the community as there will be people who would be employed as enumerators for the project during the preconstruction stage of the project.

Enhancement

As a positive impact, it can be enhanced through ensuring equity in the hiring criteria, considerations given to the 2/3 gender rule. The other vulnerable people like the disabled should also be considered during this project.

7.2 Anticipated Positive Impacts During Construction Phase

7.2.1 Roads & Drainage

Creation of employment

The project is predicted to create employment for the skilled and semiskilled locals such as socioeconomics, trainers, casual laborers for road construction and cooks and cleaners at the construction camps and casual workers

Enhancement

- Prioritizing the hire of locals for all unskilled labour.
- Implementing a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, minority clans, ethnic groups etc.
- Adhering to labour laws, and labour management practices (timely remuneration, equitable compensation for both genders for equal work etc.)
- Creating awareness to workers and the community on worker and project grievance redress mechanisms.

Increased business opportunities

The project may lead to flourishing of businesses mainly business centers located along the road due to increased demand of basic commodities and services such as food, accommodation and construction materials.

Enhancement

This can be enhanced by ensuring the contractor sources materials that can be acquired locally from available suppliers within the settlement.

Food being used at the camp can also be sourced from local women who are in the business of selling food. This can be further enhanced by creating mechanisms of purchasing items locally to also prohibit workers purchasing from local children who might be under age.

Increased Property Values

Improved infrastructure and amenities can enhance the attractiveness of an area, leading to increased property values and potential economic benefits for residents and businesses.

Increased demand of land due to the visible infrastructure development also contribute to increased property values.

Community Engagement

Construction projects often involve community consultation and participation, allowing residents to provide input on design aspects and priorities. This fosters a sense of ownership and pride in the local infrastructure.

Environmental Protection

Modern construction practices often incorporate sustainable methods and materials, which help to minimize environmental impacts and promote biodiversity.

Skills Development

Construction projects provide opportunities for skill development and training for local workers. These skills can be valuable for future employment opportunities beyond the project's duration. Only those who get employment opportunities are the one to benefit so significance of the benefit will be moderate.

Enhancement

As a way to magnify this positive benefit to the youth a CSR can be done after accomplishing construction to take the participated youth to technical colleges.

7.2.2 Street lighting

Creation of employment

The project is predicted to create employment for the skilled and semiskilled locals such as socioeconomics, trainers, casual laborers for road construction and cooks and cleaners at the construction camps and casual workers

Enhancement

- Prioritizing the hire of locals for all unskilled labour.
- Implementing a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, minority clans, ethnic groups etc.
- Adhering to labour laws, and labour management practices (timely remuneration, equitable compensation for both genders for equal work etc.)
- Creating awareness to workers and the community on worker and project grievance redress mechanisms.

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Improved infrastructure and amenities can enhance the attractiveness of an area, leading to increased property values and potential economic benefits for residents and businesses.

Increased demand of land due to the visible infrastructure development also contribute to increased property values.

Skills Development

Construction projects provide opportunities for skill development and training for local workers. These skills can be valuable for future employment opportunities beyond the project's duration. Only those who get employment opportunities are the one to benefit so significance of the benefit will be moderate.

Enhancement

As a way to magnify this positive benefit to the youth a CSR can be done after accomplishing construction to take the participated youth to technical colleges.

7.3 Anticipated positive impacts during Operation Phase

7.3.1 Roads and Drainage

The road may also open up the area to tourists since the road traverses within the municipality which is a well-known destination for tourism.

Improved transport

Creation of faster means of transport for passengers and bulk cargo within the municipality and Kwale County as a whole. There is also reduced cost of public transportation that is expected from the proposed project.

Enhancement

This should be enhanced by ensuring the roads are well maintained to improve their efficiency.

- Reduced risk of accidents on the roads
- Increased property value
- Improvement of quality of life
- Reduction in Flooding
- Prevention of Soil Erosion
- Prevention of Waterlogging
- Enhanced Traffic Management

7.3.2 Street lighting

- Protection of Infrastructure
- Aesthetic Improvement of Urban Areas
- Mitigation of Health Risks
- Increased Property Values
- Contribution of revenue to the municipality, county, national and regional governments.
- Reduced Crime Rates
- Enhanced Visibility
- Improved Safety
- Increased Security
- Support for Night-time Activities
- Boosted Economic Activity
- Improved Quality of Life

7.4 Anticipated Positive impacts During Decommissioning Phase

7.4.1 Roads & Drainage

Adaptation to Changing Needs

Decommissioning allows for the removal of infrastructure that no longer meets the needs of the community, facilitating the reallocation of resources towards more pressing priorities such as sustainable transportation options or climate resilience measures.

Improved Public Safety

Removing outdated or damaged infrastructure during decommissioning can enhance public safety by eliminating potential hazards such as deteriorating roadways, corroded drainage systems, or malfunctioning lighting fixtures.

Environmental Restoration

Decommissioning allows for the restoration of natural habitats and ecosystems that were disrupted during the construction phase. This can include re-vegetation of areas, removal of impervious surfaces, and restoration of waterways.

7.4.2 Street lighting

Cost Savings

Decommissioning outdated or underutilized infrastructure can result in long-term cost savings by reducing maintenance and operational expenses associated with maintaining and repairing aging infrastructure.

7.5 Anticipated Negative impacts During Pre-Construction Phase

7.5.1 Roads

Approval delays from NEMA and other Agencies *(Medium High)*
There is a possibility of having delays that may lead to the project taking a longer period of time than the expected. This may lead to delay of the project's kickoff period, thus delay in implementation.
Table 12: Approval delays impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Medium High**	24

This can be mitigated by ensuring all the aspects of the reports are handled keenly and well addressed, with less or no comments at all to allow swift movement of the project activities as with the schedule.
Clearing of project corridor *(Very High)*
This impact can be mitigated by preparation of a Resettlement Plan Framework, which should be done effectively to manage the land-related impacts.
Table 13: Clearing of project corridor impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3

Impact Significance Rating (Consequence × likelihood)	**Very High**	42

Facilitating all affected persons and address all grievances prior to commencing works should also be done as a mitigation measure.

Risk of excluding some beneficiaries due to unfriendly infrastructure designs *(High)*

Unfriendly infrastructure designs may inadvertently exclude certain groups within the informal settlements, such as people with disabilities, the elderly, or those with limited mobility. This exclusion can lead to social segregation and exacerbate existing inequalities. If infrastructure designs are not inclusive, it may hinder residents' access to essential services like water, sanitation, healthcare, and education. This lack of access can perpetuate poverty and marginalization within these communities.

Table 14: ***Risk of excluding some beneficiaries*** **impacts rating**

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**High**	30

Mitigation measures;

- The implementation of the infrastructure assumed universal design.
- Disseminate this information to the beneficiaries through public participation forums

Divided opinion on project implementations*(High)*

Divided opinions can lead to prolonged debates and conflicts, delaying the implementation of the project. This delay may result in missed opportunities, increased costs, and frustration among stakeholders who are eager to see tangible improvements in their communities. Persistent disagreements may erode trust between stakeholders and project implementers, undermining the legitimacy and credibility of the initiative. Without trust, collaboration and cooperation become more challenging, hindering the project's overall effectiveness.

Table 15: ***Divided opinion*** **impacts rating**

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**High**	30

Mitigation measures

- To address these impacts, it's essential for project implementers to adopt inclusive and participatory approaches that facilitate constructive dialogue, consensus-building, and conflict resolution.
- Engaging stakeholders early and regularly throughout the project lifecycle.
- Conduct extensive public participation and consultation with key stakeholders

7.5.2 Drainages

Approval delays from NEMA and other Agencies *(Medium High)*
There is a possibility of having delays that may lead to the project taking a longer period of time than the expected. This may lead to delay of the project's kickoff period, thus delay in implementation.
Table 16: Approval delays impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Medium High**	24

This can be mitigated by ensuring all the aspects of the reports are handled keenly and well addressed, with less or no comments at all to allow swift movement of the project activities as with the schedule.

Risk of excluding some beneficiaries due to unfriendly infrastructure designs *(High)*

Unfriendly infrastructure designs may inadvertently exclude certain groups within the informal settlements, such as people with disabilities, the elderly, or those with limited mobility. This exclusion can lead to social segregation and exacerbate existing inequalities. If infrastructure designs are not inclusive, it may hinder residents' access to essential services like water, sanitation, healthcare, and education. This lack of access can perpetuate poverty and marginalization within these communities.

Table 17: ***Risk of excluding some beneficiaries*** **impacts rating**

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3

Impact Significance Rating (Consequence × likelihood)	**High**	30

Mitigation measures;

- The implementation of the infrastructure assumed universal design.
- Disseminate this information to the beneficiaries through public participation forums

Divided opinion on project implementations*(High)*

Divided opinions can lead to prolonged debates and conflicts, delaying the implementation of the project. This delay may result in missed opportunities, increased costs, and frustration among stakeholders who are eager to see tangible improvements in their communities. Persistent disagreements may erode trust between stakeholders and project implementers, undermining the legitimacy and credibility of the initiative. Without trust, collaboration and cooperation become more challenging, hindering the project's overall effectiveness.

Table 18: ***Divided opinion*** **impacts rating**

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**High**	30

Mitigation measures

- To address these impacts, it's essential for project implementers to adopt inclusive and participatory approaches that facilitate constructive dialogue, consensus-building, and conflict resolution.
- Engaging stakeholders early and regularly throughout the project lifecycle.
- Conduct extensive public participation and consultation with key stakeholders

7.5.3 Street Lighting.

Approval delays from NEMA and other Agencies *(Medium High)*
There is a possibility of having delays that may lead to the project taking a longer period of time than the expected. This may lead to delay of the project's kickoff period, thus delay in implementation.
Table 19: Approval delays impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Medium High**	24

This can be mitigated by ensuring all the aspects of the reports are handled keenly and well addressed, with less or no comments at all to allow swift movement of the project activities as with the schedule.

Risk of excluding some beneficiaries due to unfriendly infrastructure designs *(High)*

Unfriendly infrastructure designs may inadvertently exclude certain groups within the informal settlements, such as people with disabilities, the elderly, or those with limited mobility. This exclusion can lead to social segregation and exacerbate existing inequalities. If infrastructure designs are not inclusive, it may hinder residents' access to essential services like water, sanitation, healthcare, and education. This lack of access can perpetuate poverty and marginalization within these communities.

Table 20: ***Risk of excluding some beneficiaries*** **impacts rating**

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**High**	30

Mitigation measures;

- The implementation of the infrastructure assumed universal design.
- Disseminate this information to the beneficiaries through public participation forums

Divided opinion on project implementations*(High)*

Divided opinions can lead to prolonged debates and conflicts, delaying the implementation of the project. This delay may result in missed opportunities, increased costs, and frustration among stakeholders who are eager to see tangible improvements in their communities. Persistent disagreements may erode trust between stakeholders and project implementers, undermining the legitimacy and credibility of the initiative. Without trust, collaboration and cooperation become more challenging, hindering the project's overall effectiveness.

Table 21: ***Divided opinion*** **impacts rating**

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**High**	30

Mitigation measures

- To address these impacts, it's essential for project implementers to adopt inclusive and participatory approaches that facilitate constructive dialogue, consensus-building, and conflict resolution.
- Engaging stakeholders early and regularly throughout the project lifecycle.
- Conduct extensive public participation and consultation with key stakeholders

7.6 Construction Phase

7.6.1 Roads and Footpaths

Soil and Water Pollution *(Low)*

Use of construction chemicals, adhesives, sealants, additives and other construction-related chemicals could introduce contaminants into the soil, affecting its composition and quality. Additionally, accidental spills or leaks of construction chemicals, fuels, and lubricants. Dumping or improper disposal of construction debris, concrete waste, and hazardous materials on the other hand can lead to soil pollution. Improper disposal of concrete washout water which contains alkaline substances and may be contaminated with cementitious materials, can harm aquatic environments like rivers present at the project areas.

Table 24: Surface and ground water pollution Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Low**	**6**

Proposed Mitigation measures

1. Store construction chemicals in designated areas with proper containment measures;
2. Develop a spill prevention and response plan to address accidental releases of hazardous materials;
3. Conduct soil and water sampling and testing before, during, and after construction to monitor soil quality especially at the operating sites;
4. Conduct educational programs for construction crews on proper soil management practices and the importance of preventing soil pollution;
5. Use designated areas for concrete washout, and provide proper containment and disposal methods. Consider using environmentally friendly concrete additives.

The following measures can be implemented to mitigate soil compaction

1. Split compacted area to reduce runoff & revegetate where necessary.
2. Vehicles to be kept in designated access roads.
3. Minimize compaction during stockpiling by working the soil in dry state.

The following measures can be implemented to mitigate soil pollution

1. Any polluted soil should be handled with care for proper disposal.
2. Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards.
3. Maintenance of vehicles to be done strictly at a designated place/Drip tray to be used to avoid oil spills.
4. Excavation materials to be stock piled at the demarcated location.

Air Pollution *(Very High)*

Dust, emissions from construction vehicles and machinery, and material processing activities contribute to air pollution, affecting air quality in the vicinity of the construction site.

Earth moving activities will result to dust generation during clearance and construction at the identified locations. This is in addition to various concrete mixing and painting activities. This will affect the construction workforce, the neighboring households and community in general, flora and fauna in the area.

Table 25: Air Pollution Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1

Likelihood	Frequency/duration of activity	4
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	**Very High**	36

Proposed Mitigation measures

1. Dust Control Measures; Implement dust control measures such as watering down construction sites, covering loose materials, and using dust suppressants to minimize airborne dust particles.
2. Vegetation and Greenery; Incorporate green infrastructure elements such as vegetative barriers and green roofs into construction projects to help absorb pollutants and improve air quality in the surrounding area.
3. Regulatory Compliance; Ensure compliance with relevant environmental regulations and permits governing air quality standards and emissions limits for construction activities.

Increased Crime and Insecurity *(Very High)*

Influx of persons to the project area may lead to increased insecurity and incidences of crime. This impact applies to all the project areas under this assessment.

Table 26: Increased Crime and Insecurity impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Very High**	32

Mitigation measures

1. Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation.
2. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices

Occupational Health and Safety Risks *(Low Medium)*

These are work related risks during construction they include all accidents and incidents, that maybe caused by fatigue, drug abuse, ignorance etc.

Table 27: Occupational Health and Safety Risks Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	Low Medium	15

Mitigation measures

- Contractor to provide a Health and Safety Plan prior to the commencement of worksto be approved by the Supervising Engineer.
- Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gum boots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer.

- Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles
- Isolate the site from access by the local communities during the construction for their safety and health
- Contractor to provide clean water for drinking and healthy food to all the workers
- Contractor to adhere to maximum eight hour working rule
- Contractor to ensure only qualified personnel operate machineries.

Sexual Exploitation and Abuse *(Low Medium)*

Defined as acts penetrated by aid workers or people associated with aid organization for this case contractors for example against the people the settlement residents during construction period. The proposed development will lead to potential for employment opportunities and access to new services, which will draw people to the area more, specifically the project site.

This factor will further lead to a temporary increase in economic activities and employment of skills for the development. This will lead to population influx which might lead to changes in or unwanted behaviors in the area. This unwanted or change in behavior may be in the form of loose morality, an increase in school drop-out due to cheap Labor, child Labor, drug use and abuse, theft/robbery and increased incidences of HIV/AIDS and related infections/diseases and other communicable diseases.

Table 28: Sexual Exploitation and Abuse Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	Low Medium	15

Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups *(Medium high)*
When disadvantaged and vulnerable groups are excluded from the decision-making process, their voices, needs, and priorities are often overlooked. This can result in infrastructure projects that fail to address the unique challenges faced by these communities, perpetuating inequality and marginalization.

Exclusion from stakeholder engagement can erode trust between communities and project implementers, leading to resentment, frustration, and social tension. Without meaningful participation and inclusion, stakeholders may become disillusioned with the project and its objectives, hindering cooperation and collaboration.

Table 29: Inadequate stakeholder Engagement Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures;

- Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.

- Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities.
- Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups.
- Develop and implementation of a stakeholder engagement plan.
- Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.

Ineffective Grievance Management *(Very High)*

When grievances are not addressed in a timely and satisfactory manner, they can escalate into larger conflicts or ongoing sources of dissatisfaction within the community. This can lead to resentment, distrust, and a breakdown of relationships between project implementers and stakeholders. Ineffective grievance management can erode trust between the project implementers and the community. If community members feel that their concerns are being ignored or dismissed, they may become disillusioned with the project and its objectives, leading to decreased cooperation and participation.

Unresolved grievances can fuel resistance to the project, potentially leading to protests, delays, or even project shutdowns. This not only undermines the project's progress but can also result in reputational damage and increased costs. Grievances that remain unaddressed can hinder the successful implementation of the project. For example, if community members are dissatisfied with certain aspects of the project design or implementation, they may be less likely to engage with or support the project, reducing its effectiveness and impact.

Table 30: Ineffective Grievance Management Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	3
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	Very High	42

Mitigation measures;

- Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms.
- Implement a workers' grievances mechanism.
- Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs.
- Log, date, process, resolve, and close-out all reported grievances in a timely manner.
- Ensure proportionate representation of disadvantaged persons in the local grievances committee.
- Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.

Child labour and Abuse Risk *(Medium high)*

In impoverished communities, families may resort to child labor out of economic necessity. This can lead to children being pulled out of school to work in informal sectors such as street vending, domestic work, or agriculture, depriving them of their right to education and exposing them to exploitation and abuse. Children engaged in labor may be subjected to exploitative working conditions, including long hours, low wages, and hazardous environments. They may be forced to undertake tasks that are physically or mentally harmful, risking their health, well-being, and development.

Table 31: Child labour and Abuse Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures

- Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws.
- Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.
- Employ workers who are 18 years and above, and with a valid national ID at the time of hire.
- Implement and monitor the employment register regularly.
- Comply with the national labour laws and labour management practices.
- Put visible signage on site "No Jobs for children."

Disruption to Public Services or destruction of public utilities *(Low medium)*

There is high potential for construction to affect powered systems especially underground lines such as water lines and even electricity etc.

Table 32: Disruption to Public Services Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	16

Waste generation *(Very High)*

A range of solid waste, both hazardous and non-hazardous, are likely to be generated during road project implementation. Wastes emanating from construction phase will mainly come from:

- Site clearance (vegetation) and excavation works (cut-to-spoil);
- Construction support activities and machinery maintenance and repair works such as used lubricant cans, packaging wrapper, worn-out tyres, and replaced equipment parts;
- Consumables (such as wood formwork, metal cuttings);
- Material testing and trial laboratories such as lab material rejects, test specimens for disposal, excess lab sample materials and grounded equipment or spares;
- Discarded material from handling losses;
- Residential camp sites waste such as leftovers/food scraps, bottles, cans, clothing, food packaging, newspapers and magazines.

Table 33: Solid waste Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2

	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	Very High	54

Mitigation measures

- Waste shall be managed as per Environmental Management and Coordination (Waste Management) Regulations 2006, e.g. No waste shall be buried underground or burned on open air.
- Contractor to develop a waste management plan.
- Manage and control waste generation at the various project sites and stations through standard operating procedures (SOPs) and Solid Waste Management Plan.
- Reduce generation of solid waste at the source through proper planning and procurement of construction materials.
- Segregation of solid wastes and provision of suitable and well labelled waste receptacles within the camp and at other active construction sites.
- Reuse excavated top soil for landscaping of the site as far as practical.
- No waste at the campsite shall be buried or burnt; all waste to be segregated and reused, composted, or collected by licensed waste handler for disposal.
- Prioritize options of waste reduction, reuse and recycling, particularly papers, polyethene, plastics, wrappers and containers as well as other materials that can possibly be recycled.

Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) ***(Low Medium)***
GBV, SEA, and SH can result in severe physical injuries, emotional trauma, and mental health issues for survivors. This can have long-lasting effects on their well-being, confidence, and ability to participate fully in community life. Incidents of GBV, SEA, and SH create an environment of fear and insecurity within the community, particularly for women and girls. They may feel unsafe in public spaces, at home, or even within their own families, leading to restrictions on their mobility and freedom

Table 34: GBV Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	16

Mitigation measures

- Develop and implement a plan to manage the risk of SEA/SH.
- Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH.
- Ensure the GRM is SEA/SH-responsive.

Noise and Excessive Vibrations. *(Very High)*

Noise and Excessive Vibrations are caused by operation of construction plant and equipment and activities such as excavation and rock breaking. This impact poses a health and safety risk to both the communities living in the project area and construction workers.

Noise pollution will mainly result from construction vehicles movement as well as from various machinery operations used in construction including metal grinding and welding works, excavations, blasting among other machinery operations. Excessive noise will impact on the community residing within near and along the project areas, as well as the construction workforce.

Vibrations on the other hand would be caused by grading activities, drilling as well as blasting activities. Excessive vibration has the potential to affect the existing infrastructure (people's homes, roads, bridges), destabilize the area geological formation and structural integrity of community houses.

Table 35: Noise Pollution Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Very High**	40

Proposed mitigation measures

1. Contractor will comply with provisions of EMCA 1999 and amendments 2015 (Noise and Excessive Vibrations Regulations of 2009)
2. The Contractor shall keep noise level within acceptable limits (55 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas.
3. Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity.
4. Undertake Noise and Excessive Vibration Assessments.
5. Effective use of appropriate PPE by exposed workers and Proper maintenance of machines.
6. Any complaints received by the Contractor regarding noise will be recorded and communicated to the Supervising Engineer for appropriate action.

Risk of excluding some beneficiaries due to unfriendly infrastructure designs *(High)*

If infrastructure designs are not inclusive, it may hinder residents' access to essential services like water, sanitation, healthcare, and education. This lack of access can perpetuate poverty and marginalization within these communities. Unfriendly designs may compromise the safety of residents, especially in disaster-prone areas. For example, inadequate drainage systems can lead to flooding during heavy rains, putting lives and property at risk. Exclusionary infrastructure may impact the economic opportunities available to residents. For instance, poorly planned roads and transportation systems can hinder businesses from operating effectively and limit employment opportunities.

Table 36: Risk of excluding some beneficiaries Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	High	25

Mitigation measures;

- The implementation of the infrastructure assumed universal design.
- Disseminate this information to the beneficiaries through public participation forums

7.6.2 Drainages

Soil and Water Pollution *(Low)*

Use of construction chemicals, adhesives, sealants, additives and other construction-related chemicals could introduce contaminants into the soil, affecting its composition and quality. Additionally, accidental spills or leaks of construction chemicals, fuels, and lubricants. Dumping or improper disposal of construction debris, concrete waste, and hazardous materials on the other hand can lead to soil pollution. Improper disposal of concrete washout water which contains alkaline substances and may be contaminated with cementitious materials, can harm aquatic environments like rivers present at the project areas.

Table 37: Surface and ground water pollution Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Low**	6

Proposed Mitigation measures

6. Store construction chemicals in designated areas with proper containment measures;
7. Develop a spill prevention and response plan to address accidental releases of hazardous materials;
8. Conduct soil and water sampling and testing before, during, and after construction to monitor soil quality especially at the operating sites;
9. Conduct educational programs for construction crews on proper soil management practices and the importance of preventing soil pollution;

10. Use designated areas for concrete washout, and provide proper containment and disposal methods. Consider using environmentally friendly concrete additives.

The following measures can be implemented to mitigate soil compaction

4. Split compacted area to reduce runoff & revegetate where necessary.
5. Vehicles to be kept in designated access roads.
6. Minimize compaction during stockpiling by working the soil in dry state.

The following measures can be implemented to mitigate soil pollution

5. Any polluted soil should be handled with care for proper disposal.
6. Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards.
7. Maintenance of vehicles to be done strictly at a designated place/Drip tray to be used to avoid oil spills.
8. Excavation materials to be stock piled at the demarcated location.

Air Pollution *(Very High)*

Dust, emissions from construction vehicles and machinery, and material processing activities contribute to air pollution, affecting air quality in the vicinity of the construction site.

Earth moving activities will result to dust generation during clearance and construction at the identified locations. This is in addition to various concrete mixing and painting activities. This will affect the construction workforce, the neighboring households and community in general, flora and fauna in the area.

Table 38: Air Pollution Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	**Very High**	36

Proposed Mitigation measures

4. Dust Control Measures; Implement dust control measures such as watering down construction sites, covering loose materials, and using dust suppressants to minimize airborne dust particles.
5. Vegetation and Greenery; Incorporate green infrastructure elements such as vegetative barriers and green roofs into construction projects to help absorb pollutants and improve air quality in the surrounding area.
6. Regulatory Compliance; Ensure compliance with relevant environmental regulations and permits governing air quality standards and emissions limits for construction activities.

Increased Crime and Insecurity *(Very High)*

Influx of persons to the project area may lead to increased insecurity and incidences of crime. This impact applies to all the project areas under this assessment.

Table 39: Increased Crime and Insecurity impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Very High**	32

Mitigation measures

3. Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation.
4. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices

Occupational Health and Safety Risks *(Low Medium)*

These are work related risks during construction they include all accidents and incidents, that maybe caused by fatigue, drug abuse, ignorance etc.

Table 40: Occupational Health and Safety Risks Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	Low Medium	15

Mitigation measures

- Contractor to provide a Health and Safety Plan prior to the commencement of worksto be approved by the Supervising Engineer.
- Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gum boots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer.
- Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles
- Isolate the site from access by the local communities during the construction for their safety and health
- Contractor to provide clean water for drinking and healthy food to all the workers
- Contractor to adhere to maximum eight hour working rule
- Contractor to ensure only qualified personnel operate machineries.

Sexual Exploitation and Abuse *(Low Medium)*

Defined as acts penetrated by aid workers or people associated with aid organization for this case contractors for example against the people the settlement residents during construction period. The proposed development will lead to potential for employment opportunities and access to new services, which will draw people to the area more, specifically the project site.

This factor will further lead to a temporary increase in economic activities and employment of skills for the development. This will lead to population influx which might lead to changes in or unwanted behaviors in the area. This unwanted or change in behavior may be in the form of loose morality, an increase in school drop-out due to cheap Labor, child Labor, drug use and abuse, theft/robbery and increased incidences of HIV/AIDS and related infections/diseases and other communicable diseases.

Table 41: Sexual Exploitation and Abuse Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	2

Impact Significance Rating (Consequence × likelihood)	Low Medium	15

Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups *(Medium high)*
When disadvantaged and vulnerable groups are excluded from the decision-making process, their voices, needs, and priorities are often overlooked. This can result in infrastructure projects that fail to address the unique challenges faced by these communities, perpetuating inequality and marginalization.

Exclusion from stakeholder engagement can erode trust between communities and project implementers, leading to resentment, frustration, and social tension. Without meaningful participation and inclusion, stakeholders may become disillusioned with the project and its objectives, hindering cooperation and collaboration.

Table 42: Inadequate stakeholder Engagement Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures;

- Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.
- Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities.
- Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups.
- Develop and implementation of a stakeholder engagement plan.
- Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.

Child labour and Abuse Risk *(Medium high)*
In impoverished communities, families may resort to child labor out of economic necessity. This can lead to children being pulled out of school to work in informal sectors such as street vending, domestic work, or agriculture, depriving them of their right to education and exposing them to exploitation and abuse. Children engaged in labor may be subjected to exploitative working conditions, including long hours, low wages, and hazardous environments. They may be forced to undertake tasks that are physically or mentally harmful, risking their health, well-being, and development.

Table 43: Child labour and Abuse Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures

- Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws.

- Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.
- Employ workers who are 18 years and above, and with a valid national ID at the time of hire.
- Implement and monitor the employment register regularly.
- Comply with the national labour laws and labour management practices.
- Put visible signage on site "No Jobs for children."

Disruption to Public Services or destruction of public utilities *(Low medium)*

There is high potential for construction to affect powered systems especially underground lines such as water lines and even electricity etc.

Table 45: Disruption to Public Services Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	16

Waste generation *(Very High)*

A range of solid waste, both hazardous and non-hazardous, are likely to be generated during road project implementation. Wastes emanating from construction phase will mainly come from:

- Site clearance (vegetation) and excavation works (cut-to-spoil);
- Construction support activities and machinery maintenance and repair works such as used lubricant cans, packaging wrapper, worn-out tyres, and replaced equipment parts;
- Consumables (such as wood formwork, metal cuttings);
- Material testing and trial laboratories such as lab material rejects, test specimens for disposal, excess lab sample materials and grounded equipment or spares;
- Discarded material from handling losses;
- Residential camp sites waste such as leftovers/food scraps, bottles, cans, clothing, food packaging, newspapers and magazines.

Table 46: Solid waste Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	Very High	54

Mitigation measures

- Waste shall be managed as per Environmental Management and Coordination (Waste Management) Regulations 2006, e.g. No waste shall be buried underground or burned on open air.
- Contractor to develop a waste management plan.
- Manage and control waste generation at the various project sites and stations through standard operating procedures (SOPs) and Solid Waste Management Plan.
- Reduce generation of solid waste at the source through proper planning and procurement of construction materials.

- Segregation of solid wastes and provision of suitable and well labelled waste receptacles within the camp and at other active construction sites.
- Reuse excavated top soil for landscaping of the site as far as practical.
- No waste at the campsite shall be buried or burnt; all waste to be segregated and reused, composted, or collected by licensed waste handler for disposal.
- Prioritize options of waste reduction, reuse and recycling, particularly papers, polyethene, plastics, wrappers and containers as well as other materials that can possibly be recycled.

Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) ***(Low Medium)***

GBV, SEA, and SH can result in severe physical injuries, emotional trauma, and mental health issues for survivors. This can have long-lasting effects on their well-being, confidence, and ability to participate fully in community life. Incidents of GBV, SEA, and SH create an environment of fear and insecurity within the community, particularly for women and girls. They may feel unsafe in public spaces, at home, or even within their own families, leading to restrictions on their mobility and freedom.

Table 47: GBV Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	16

Mitigation measures

- Develop and implement a plan to manage the risk of SEA/SH.
- Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH.
- Ensure the GRM is SEA/SH-responsive.

Noise and Excessive Vibrations. ***(Very High)***

Noise and Excessive Vibrations are caused by operation of construction plant and equipment and activities such as excavation and rock breaking. This impact poses a health and safety risk to both the communities living in the project area and construction workers.

Noise pollution will mainly result from construction vehicles movement as well as from various machinery operations used in construction including metal grinding and welding works, excavations, blasting among other machinery operations. Excessive noise will impact on the community residing within near and along the project areas, as well as the construction workforce.

Vibrations on the other hand would be caused by grading activities, drilling as well as blasting activities. Excessive vibration has the potential to affect the existing infrastructure (people's homes, roads, bridges), destabilize the area geological formation and structural integrity of community houses.

Table 48: Noise Pollution Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4

Impact Significance Rating (Consequence × likelihood)	**Very High**	40

Proposed mitigation measures

7. Contractor will comply with provisions of EMCA 1999 and amendments 2015 (Noise and Excessive Vibrations Regulations of 2009)
8. The Contractor shall keep noise level within acceptable limits (55 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas.
9. Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity.
10. Undertake Noise and Excessive Vibration Assessments.
11. Effective use of appropriate PPE by exposed workers and Proper maintenance of machines.
12. Any complaints received by the Contractor regarding noise will be recorded and communicated to the Supervising Engineer for appropriate action.

Risk of excluding some beneficiaries due to unfriendly infrastructure designs *(High)*

If infrastructure designs are not inclusive, it may hinder residents' access to essential services like water, sanitation, healthcare, and education. This lack of access can perpetuate poverty and marginalization within these communities. Unfriendly designs may compromise the safety of residents, especially in disaster-prone areas. For example, inadequate drainage systems can lead to flooding during heavy rains, putting lives and property at risk. Exclusionary infrastructure may impact the economic opportunities available to residents. For instance, poorly planned roads and transportation systems can hinder businesses from operating effectively and limit employment opportunities.

Table 49: Risk of excluding some beneficiaries Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	High	25

Mitigation measures;

- The implementation of the infrastructure assumed universal design.

Disseminate this information to the beneficiaries through public participation forums

7.6.3 Street Lighting

Occupational Health and Safety Risks *(Low Medium)*

These are work related risks during construction they include all accidents and incidents, that maybe caused by fatigue, drug abuse, ignorance etc.

Table 40: Occupational Health and Safety Risks Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2

	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	Low Medium	15

Mitigation measures

- Contractor to provide a Health and Safety Plan prior to the commencement of worksto be approved by the Supervising Engineer.
- Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gum boots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer.
- Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles
- Isolate the site from access by the local communities during the construction for their safety and health
- Contractor to provide clean water for drinking and healthy food to all the workers
- Contractor to adhere to maximum eight hour working rule
- Contractor to ensure only qualified personnel operate machineries.

Sexual Exploitation and Abuse *(Low Medium)*

Defined as acts penetrated by aid workers or people associated with aid organization for this case contractors for example against the people the settlement residents during construction period. The proposed development will lead to potential for employment opportunities and access to new services, which will draw people to the area more, specifically the project site.

This factor will further lead to a temporary increase in economic activities and employment of skills for the development. This will lead to population influx which might lead to changes in or unwanted behaviors in the area. This unwanted or change in behavior may be in the form of loose morality, an increase in school drop-out due to cheap Labor, child Labor, drug use and abuse, theft/robbery and increased incidences of HIV/AIDS and related infections/diseases and other communicable diseases.

Table 41: Sexual Exploitation and Abuse Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	Low Medium	15

Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups *(Medium high)*
When disadvantaged and vulnerable groups are excluded from the decision-making process, their voices, needs, and priorities are often overlooked. This can result in infrastructure projects that fail to address the unique challenges faced by these communities, perpetuating inequality and marginalization.

Exclusion from stakeholder engagement can erode trust between communities and project implementers, leading to resentment, frustration, and social tension. Without meaningful participation and inclusion, stakeholders may become disillusioned with the project and its objectives, hindering cooperation and collaboration.

Table 42: Inadequate stakeholder Engagement Impacts Rating

Criteria	**Rating**

Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures;

- Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.
- Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities.
- Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups.
- Develop and implementation of a stakeholder engagement plan.
- Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.

Child labour and Abuse Risk *(Medium high)*

In impoverished communities, families may resort to child labor out of economic necessity. This can lead to children being pulled out of school to work in informal sectors such as street vending, domestic work, or agriculture, depriving them of their right to education and exposing them to exploitation and abuse. Children engaged in labor may be subjected to exploitative working conditions, including long hours, low wages, and hazardous environments. They may be forced to undertake tasks that are physically or mentally harmful, risking their health, well-being, and development.

Table 43: Child labour and Abuse Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures

- Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws.
- Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.
- Employ workers who are 18 years and above, and with a valid national ID at the time of hire.
- Implement and monitor the employment register regularly.
- Comply with the national labour laws and labour management practices.
- Put visible signage on site “No Jobs for children.”

Disruption to Public Services or destruction of public utilities *(Low medium)*

There is high potential for construction to affect powered systems especially underground lines such as water lines and even electricity etc.

Table 45: Disruption to Public Services Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1

	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	16

Waste generation *(Very High)*

A range of solid waste, both hazardous and non-hazardous, are likely to be generated during road project implementation. Wastes emanating from construction phase will mainly come from:

- Site clearance (vegetation) and excavation works (cut-to-spoil);
- Construction support activities and machinery maintenance and repair works such as used lubricant cans, packaging wrapper, worn-out tyres, and replaced equipment parts;
- Consumables (such as wood formwork, metal cuttings);
- Material testing and trial laboratories such as lab material rejects, test specimens for disposal, excess lab sample materials and grounded equipment or spares;
- Discarded material from handling losses;
- Residential camp sites waste such as leftovers/food scraps, bottles, cans, clothing, food packaging, newspapers and magazines.

Table 46: Solid waste Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	Very High	54

Mitigation measures

- Waste shall be managed as per Environmental Management and Coordination (Waste Management) Regulations 2006, e.g. No waste shall be buried underground or burned on open air.
- Contractor to develop a waste management plan.
- Manage and control waste generation at the various project sites and stations through standard operating procedures (SOPs) and Solid Waste Management Plan.
- Reduce generation of solid waste at the source through proper planning and procurement of construction materials.
- Segregation of solid wastes and provision of suitable and well labelled waste receptacles within the camp and at other active construction sites.
- Reuse excavated top soil for landscaping of the site as far as practical.
- No waste at the campsite shall be buried or burnt; all waste to be segregated and reused, composted, or collected by licensed waste handler for disposal.
- Prioritize options of waste reduction, reuse and recycling, particularly papers, polyethene, plastics, wrappers and containers as well as other materials that can possibly be recycled.

Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) *(Low Medium)*

GBV, SEA, and SH can result in severe physical injuries, emotional trauma, and mental health issues for survivors. This can have long-lasting effects on their well-being, confidence, and ability to participate fully in community life. Incidents of GBV, SEA, and SH create an environment of fear and insecurity within the community, particularly for women and girls. They may feel unsafe in public spaces, at home, or even within their own families, leading to restrictions on their mobility and freedom.

Table 47: GBV Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	16

Mitigation measures

- Develop and implement a plan to manage the risk of SEA/SH.
- Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH.
- Ensure the GRM is SEA/SH-responsive.

Risk of excluding some beneficiaries due to unfriendly infrastructure designs *(High)*

If infrastructure designs are not inclusive, it may hinder residents' access to essential services like water, sanitation, healthcare, and education. This lack of access can perpetuate poverty and marginalization within these communities. Unfriendly designs may compromise the safety of residents, especially in disaster-prone areas. For example, inadequate drainage systems can lead to flooding during heavy rains, putting lives and property at risk. Exclusionary infrastructure may impact the economic opportunities available to residents. For instance, poorly planned roads and transportation systems can hinder businesses from operating effectively and limit employment opportunities.

Table 49: Risk of excluding some beneficiaries Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	High	25

Mitigation measures;

- The implementation of the infrastructure assumed universal design.
- Disseminate this information to the beneficiaries through public participation forums

7.7 Operational Phase

7.7.1 Roads and footpaths

Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) *(Medium high)*
This is likely to be caused by influx of people in the project area. Incidents of GBV, SEA, and SH create an environment of fear and insecurity within the community, particularly for women and girls. They may feel unsafe in public spaces, at home, or even within their own families, leading to restrictions on their mobility and freedom.

Table 50: Gender based violence Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	4
Likelihood	Frequency/duration of activity	2
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	**Medium High**	24

Mitigation measures

1. Develop and implement a plan to manage the risk of SEA/SH.
2. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH.
3. Ensure the GRM is SEA/SH-responsive.

Ineffective Grievance Management *(Very High)*

When grievances are not addressed promptly or adequately, they can escalate into conflicts between stakeholders such as local communities, project developers, contractors, and regulatory agencies.

Table 51: Ineffective Grievance Management Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	3
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	Very High	42

Mitigation measures;

1. Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms.
2. Implement a workers' grievances mechanism.
3. Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs.
4. Log, date, process, resolve, and close-out all reported grievances in a timely manner.
5. Ensure proportionate representation of disadvantaged persons in the local grievances committee.
6. Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.

Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups *(Medium high)*

Excluding disadvantaged and vulnerable groups from stakeholder engagement processes can bring social injustice, Loss of Trust and Credibility and increase the likelihood of misunderstandings, conflicts, and resistance to the project.

Table 52: Inadequate stakeholder Engagement Impacts Rating b

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures;

1. Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.
2. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities.
3. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups.
4. Develop and implementation of a stakeholder engagement plan.
5. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.

Energy Consumption *(Low Medium)*

High mast lights, especially if inefficient or not equipped with energy-saving technologies, can contribute to high energy consumption, leading to increased carbon emissions and operational costs.

Table 53: Energy Consumption Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	16

Mitigation measures:

1. A programmable timer shall control exterior lights.
2. Generator should be provided as a full backup energy source throughout the development.
3. Install and routine maintenance of energy efficient appliances e.g. LED bulbs etc.
4. Monitor energy use during construction and set reasonable limit.
5. Put off all lights immediately when not in use or are not needed.
6. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate.
7. Turn off machinery and equipment when not in use.
8. Use of solar energy as an alternative source of energy at contractor's camp sites.

Light and Visual discomfort *(Medium high)*

High mast lights can contribute to light pollution when inappropriately placed or excessively bright high mast lights causing glare and visual discomfort for nearby residents, affecting the natural darkness of the night sky and impacting the visibility of celestial bodies.

Table 54: Light and Visual Discomfort Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1

	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Medium high	20

Mitigation measures

1. Properly design and angle light fixtures to minimize glare.
2. Consider installing light shields or diffusers to control light direction.
3. Seek aviation lighting design principles
4. Use shielded fixtures and directional lighting to minimize light spillage.
5. Implement curfew times for non-essential lighting.
6. Educate the community on responsible lighting practices.

Water Pollution/Contamination *(Very Low)*

Improper construction and management of storm water drains can lead to water contamination, affecting local water quality.

Contaminated water sources can lead to a range of health problems, including waterborne diseases such as cholera, typhoid, and diarrhea. These diseases can be especially dangerous for children, the elderly, and people with weakened immune systems, leading to illness, hospitalization, and even death.

Pollution from sources such as untreated sewage, industrial waste, and agricultural runoff can degrade water quality and harm aquatic ecosystems. This can lead to the loss of biodiversity, disruption of natural habitats, and decline in water availability for drinking, irrigation, and sanitation purposes.

Table 55: Water pollution impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Very Low**	6

To mitigate the impacts of water pollution and contamination, the project should prioritize integrated water management approaches that address both the root causes and symptoms of pollution. This includes investing in infrastructure for safe drinking water supply, wastewater treatment, and solid waste management, promoting sustainable agricultural practices to reduce runoff and pollution, strengthening regulatory frameworks and enforcement mechanisms to prevent industrial pollution, and raising awareness about the importance of water conservation and pollution prevention among community members. By taking proactive measures to protect water resources, the project can contribute to the health, prosperity, and resilience of Upper Kariokor informal settlement and its residents.

Alteration of Natural Drainage Patterns *(Very Low)*

The construction of storm water drains can alter natural drainage patterns, potentially causing unintended consequences for the local environment.

Table 56: Alteration of natural drainage patterns impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1

	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Very Low**	6

Mitigation measures

1. Conduct detailed hydrological studies to understand natural drainage patterns.
2. Design drainage systems that mimic natural flow to reduce environmental impact

Disturbance to Nocturnal Wildlife *(Very Low)*

Excessive artificial lighting can disrupt the behavior and habitats of nocturnal wildlife in the area.

Table 57: Disturbance to nocturnal wildlife impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Very Low**	6

Mitigation measures

1. Install motion sensors or timers to reduce lighting intensity during periods of low activity.
2. Choose warm-coloured lights that are less disruptive to wildlife.

7.7.2 Drainages

Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) *(Medium high)*

This is likely to be caused by influx of people in the project area. Incidents of GBV, SEA, and SH create an environment of fear and insecurity within the community, particularly for women and girls. They may feel unsafe in public spaces, at home, or even within their own families, leading to restrictions on their mobility and freedom.

Table 50: Gender based violence Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	4
Likelihood	Frequency/duration of activity	2
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	**Medium High**	24

Mitigation measures

1. Develop and implement a plan to manage the risk of SEA/SH.
2. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH.
3. Ensure the GRM is SEA/SH-responsive.

Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups *(Medium high)*

Excluding disadvantaged and vulnerable groups from stakeholder engagement processes can bring social injustice, Loss of Trust and Credibility and increase the likelihood of misunderstandings, conflicts, and resistance to the project.

Table 52: Inadequate stakeholder Engagement Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3

	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures;

1. Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.
2. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities.
3. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups.
4. Develop and implementation of a stakeholder engagement plan.
5. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.

Water Pollution/Contamination *(Very Low)*

Improper construction and management of storm water drains can lead to water contamination, affecting local water quality.

Contaminated water sources can lead to a range of health problems, including waterborne diseases such as cholera, typhoid, and diarrhea. These diseases can be especially dangerous for children, the elderly, and people with weakened immune systems, leading to illness, hospitalization, and even death.

Pollution from sources such as untreated sewage, industrial waste, and agricultural runoff can degrade water quality and harm aquatic ecosystems. This can lead to the loss of biodiversity, disruption of natural habitats, and decline in water availability for drinking, irrigation, and sanitation purposes.

Table 55: Water pollution impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Very Low**	6

To mitigate the impacts of water pollution and contamination, the project should prioritize integrated water management approaches that address both the root causes and symptoms of pollution. This includes investing in infrastructure for safe drinking water supply, wastewater treatment, and solid waste management, promoting sustainable agricultural practices to reduce runoff and pollution, strengthening regulatory frameworks and enforcement mechanisms to prevent industrial pollution, and raising awareness about the importance of water conservation and pollution prevention among community members. By taking proactive measures to protect water resources, the project can contribute to the health, prosperity, and resilience of Upper Kariokor informal settlement and its residents.

Alteration of Natural Drainage Patterns *(Very Low)*

The construction of storm water drains can alter natural drainage patterns, potentially causing unintended consequences for the local environment.

Table 56: Alteration of natural drainage patterns impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1

	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Very Low**	6

Mitigation measures

1. Conduct detailed hydrological studies to understand natural drainage patterns.
2. Design drainage systems that mimic natural flow to reduce environmental impact

7.7.3 Street Lighting

Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) ***(Medium high)***
This is likely to be caused by influx of people in the project area. Incidents of GBV, SEA, and SH create an environment of fear and insecurity within the community, particularly for women and girls. They may feel unsafe in public spaces, at home, or even within their own families, leading to restrictions on their mobility and freedom.

Table 50: Gender based violence Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	4
Likelihood	Frequency/duration of activity	2
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	**Medium High**	24

Mitigation measures

4. Develop and implement a plan to manage the risk of SEA/SH.
5. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH.
6. Ensure the GRM is SEA/SH-responsive.

Ineffective Grievance Management *(Very High)*

When grievances are not addressed promptly or adequately, they can escalate into conflicts between stakeholders such as local communities, project developers, contractors, and regulatory agencies.

Table 51: Ineffective Grievance Management Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	3
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	Very High	42

Mitigation measures;

1. Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms.
2. Implement a workers' grievances mechanism.
3. Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs.
4. Log, date, process, resolve, and close-out all reported grievances in a timely manner.
5. Ensure proportionate representation of disadvantaged persons in the local grievances committee.
6. Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.

Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups *(Medium high)*

Excluding disadvantaged and vulnerable groups from stakeholder engagement processes can bring social injustice, Loss of Trust and Credibility and increase the likelihood of misunderstandings, conflicts, and resistance to the project.

Table 52: Inadequate stakeholder Engagement Impacts Rating b

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	3

Impact Significance Rating (Consequence × likelihood)	Medium high	24

Mitigation measures;

1. Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.
2. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities.
3. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups.
4. Develop and implementation of a stakeholder engagement plan.
5. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.

Energy Consumption *(Low Medium)*

High mast lights, especially if inefficient or not equipped with energy-saving technologies, can contribute to high energy consumption, leading to increased carbon emissions and operational costs.

Table 53: Energy Consumption Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	3
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	16

Mitigation measures:

1. A programmable timer shall control exterior lights.
2. Generator should be provided as a full backup energy source throughout the development.
3. Install and routine maintenance of energy efficient appliances e.g. LED bulbs etc.
4. Monitor energy use during construction and set reasonable limit.
5. Put off all lights immediately when not in use or are not needed.
6. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate.
7. Turn off machinery and equipment when not in use.
8. Use of solar energy as an alternative source of energy at contractor's camp sites.

Light and Visual discomfort *(Medium high)*

High mast lights can contribute to light pollution when inappropriately placed or excessively bright high mast lights causing glare and visual discomfort for nearby residents, affecting the natural darkness of the night sky and impacting the visibility of celestial bodies.

Table 54: Light and Visual Discomfort Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	4
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Medium high	20

Mitigation measures

1. Properly design and angle light fixtures to minimize glare.

2. Consider installing light shields or diffusers to control light direction.
3. Seek aviation lighting design principles
4. Use shielded fixtures and directional lighting to minimize light spillage.
5. Implement curfew times for non-essential lighting.
6. Educate the community on responsible lighting practices.

Disturbance to Nocturnal Wildlife *(Very Low)*

Excessive artificial lighting can disrupt the behavior and habitats of nocturnal wildlife in the area.

Table 57: Disturbance to nocturnal wildlife impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Very Low**	6

Mitigation measures

1. Install motion sensors or timers to reduce lighting intensity during periods of low activity.
2. Choose warm-coloured lights that are less disruptive to wildlife.

7.8 Decommissioning Phase

7.8.1 Roads and Footpaths

Disruption of Services *(Low Medium)*

Decommissioning may disrupt regular services like traffic flow, water drainage, and lighting, causing inconvenience to residents and commuters.

Table 58: Disruption of se4rvices impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	4
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	16

Mitigation measures

1. Implement phased decommissioning to minimize disruption to services.
2. Provide alternative routes or transportation options for affected commuters.
3. Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.

Environmental Disturbance *(Low Medium)*

Decommissioning activities can disturb natural habitats, soil, and waterways. The removal of infrastructure might also disrupt ecosystems that have adapted to their presence.

Table 59: Environmental disturbance impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2

Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	14

Mitigation measures

1. Conduct thorough environmental impact assessments prior to decommissioning.
2. Implement erosion and sediment control measures to prevent soil erosion and water pollution.
3. Replant native vegetation and restore habitats affected by decommissioning activities.

Waste Generation *(Low Medium)*

Decommissioning generates waste materials such as concrete, asphalt, and electrical components, which may end up in landfills if not properly managed.

Table 60: Waste generation impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	12

Mitigation measures

1. Implement recycling and reuse programs for materials like concrete and asphalt.
2. Properly dispose of hazardous materials in accordance with regulations.
3. Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.

Economic Loss *(Low Medium)*

Businesses and communities reliant on the infrastructure being decommissioned may suffer economic losses due to decreased accessibility or functionality.

Table 61: Economic loss impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	2
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	14

Mitigation measures

1. Provide support and incentives for local businesses affected by decommissioning.
2. Offer compensation or assistance programs to mitigate financial losses.
3. Develop alternative economic opportunities or infrastructure projects to offset any negative economic impacts.

Health and Safety Concerns*(Medium)*

Decommissioning activities can pose health and safety risks to workers and nearby residents due to noise pollution, air pollution from construction vehicles, and potential accidents.

Table 62: Health and safety concerns impacts rating

Criteria	**Rating**

Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	2
	Frequency of impact	2
Impact Significance Rating	**Medium High**	24
Criteria		**Rating**
(Consequence × likelihood)		

Mitigation measures

1. Enforce strict safety regulations and provide adequate training for workers.
2. Implement dust and noise control measures to minimize pollution and disturbance to nearby residents.
3. Communicate potential risks to the public and provide guidance on safety precautions.

7.8.2 Drainages

Disruption of Services *(Low Medium)*

Decommissioning may disrupt regular services like traffic flow, water drainage, and lighting, causing inconvenience to residents and commuters.

Table 58: Disruption of se4rvices impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	4
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	16

Mitigation measures

4. Implement phased decommissioning to minimize disruption to services.
5. Provide alternative routes or transportation options for affected commuters.
6. Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.

Environmental Disturbance *(Low Medium)*

Decommissioning activities can disturb natural habitats, soil, and waterways. The removal of infrastructure might also disrupt ecosystems that have adapted to their presence.

Table 59: Environmental disturbance impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	14

Mitigation measures

4. Conduct thorough environmental impact assessments prior to decommissioning.
5. Implement erosion and sediment control measures to prevent soil erosion and water pollution.
6. Replant native vegetation and restore habitats affected by decommissioning activities.

Waste Generation *(Low Medium)*

Decommissioning generates waste materials such as concrete, asphalt, and electrical components, which may end up in landfills if not properly managed.

Table 60: Waste generation impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	12

Mitigation measures

4. Implement recycling and reuse programs for materials like concrete and asphalt.
5. Properly dispose of hazardous materials in accordance with regulations.
6. Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.

Economic Loss *(Low Medium)*

Businesses and communities reliant on the infrastructure being decommissioned may suffer economic losses due to decreased accessibility or functionality.

Table 61: Economic loss impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	2
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	14

Mitigation measures

4. Provide support and incentives for local businesses affected by decommissioning.
5. Offer compensation or assistance programs to mitigate financial losses.
6. Develop alternative economic opportunities or infrastructure projects to offset any negative economic impacts.

Health and Safety Concerns*(Medium)*

Decommissioning activities can pose health and safety risks to workers and nearby residents due to noise pollution, air pollution from construction vehicles, and potential accidents.

Table 62: Health and safety concerns impacts rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	2
	Frequency of impact	2
Impact Significance Rating	**Medium High**	24
Criteria		**Rating**
(Consequence × likelihood)		

Mitigation measures

4. Enforce strict safety regulations and provide adequate training for workers.
5. Implement dust and noise control measures to minimize pollution and disturbance to nearby residents.
6. Communicate potential risks to the public and provide guidance on safety precautions.

7.8.3 Street Lighting

Disruption of Services *(Low Medium)*
Decommissioning may disrupt regular services like traffic flow, water drainage, and lighting, causing inconvenience to residents and commuters.
Table 58: Disruption of se4rvices impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	4
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	16

Mitigation measures
7. Implement phased decommissioning to minimize disruption to services.
8. Provide alternative routes or transportation options for affected commuters.
9. Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.

Environmental Disturbance *(Low Medium)*
Decommissioning activities can disturb natural habitats, soil, and waterways. The removal of infrastructure might also disrupt ecosystems that have adapted to their presence.
Table 59: Environmental disturbance impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	2
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	14

Mitigation measures
1. Conduct thorough environmental impact assessments prior to decommissioning.
2. Implement erosion and sediment control measures to prevent soil erosion and water pollution.
3. Replant native vegetation and restore habitats affected by decommissioning activities.

Waste Generation *(Low Medium)*
Decommissioning generates waste materials such as concrete, asphalt, and electrical components, which may end up in landfills if not properly managed.
Table 60: Waste generation impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	3
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	1

	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	12

Mitigation measures

1. Implement recycling and reuse programs for materials like concrete and asphalt.
2. Properly dispose of hazardous materials in accordance with regulations.
3. Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.

Economic Loss *(Low Medium)*

Businesses and communities reliant on the infrastructure being decommissioned may suffer economic losses due to decreased accessibility or functionality.

Table 61: Economic loss impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	2
Likelihood	Frequency/duration of activity	1
	Frequency of impact	1
Impact Significance Rating (Consequence × likelihood)	Low Medium	14

Mitigation measures

1. Provide support and incentives for local businesses affected by decommissioning.
2. Offer compensation or assistance programs to mitigate financial losses.
3. Develop alternative economic opportunities or infrastructure projects to offset any negative economic impacts.

Health and Safety Concerns*(Medium)*

Decommissioning activities can pose health and safety risks to workers and nearby residents due to noise pollution, air pollution from construction vehicles, and potential accidents.

Table 62: Health and safety concerns impacts rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	1
Likelihood	Frequency/duration of activity	2
	Frequency of impact	2
Impact Significance Rating	**Medium High**	24
Criteria		**Rating**
(Consequence × likelihood)		

Mitigation measures

1. Enforce strict safety regulations and provide adequate training for workers.
2. Implement dust and noise control measures to minimize pollution and disturbance to nearby residents.
3. Communicate potential risks to the public and provide guidance on safety precautions.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMP)

8.1 Introduction

Environmental monitoring is an essential component of project implementation. An Environmental Management and Monitoring Plan (ESMMP) provides mechanism of monitoring environmental impacts of a project during its execution in order to reduce their negative effects and to introduce standards of good practice to be adopted for all project works. The ESMP facilitates and ensures the follow-up of the implementation of the proposed mitigation measures proposed in the ESMMP. The parameters of the proposed upgrade of roads, construction of storm water drainage, and installation of high-mast lights projects that were identified for monitoring include: water quality, air quality, solid waste generation, Occupational Health and Safety risks, human accidents, HIV/AIDS incidences, soil erosion, storm water drainage, livelihood and environmental risks. This is represented in the table below.

8.2 Purpose and Objectives of ESMMP

The ESMMP describes the range of environmental and social issues associated with the project and outlines corresponding management strategies that will be employed to mitigate potential adverse environmental impacts. The ESMMP conveys the Project's environmental and social constraints. The project will comply with all local laws and regulations, which seek to ensure that the road construction and operation does not adversely affect the environment and social community resources.
The project supervision may periodically revise the ESMMP in consultation with the Contractor, and subject to the approval from National Environment Management Authority (NEMA). The revisions may be made to accommodate changes in work, weather, and general conditions. The ESMMP should be made available to all the project staffs.
The objectives of the ESMMP are:

- To serve as a commitment and reference for the project planners and implementers including conditions of approval from NEMA;
- To serve as a guiding document for the environmental and social monitoring activities for future studies, on requisite progress reports;
- To provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment;
- To provide instructions to relevant project personnel regarding procedures for protecting the environment and minimizing environmental and social effects, thereby supporting the project goal of minimal or zero incidents;
- To document environmental and social concerns and appropriate protection measures; while ensuring that corrective actions are completed in a timely manner; and
- To address capacity building requirements within the project team, if necessary.

8.3 Auditing of the ESMMP

KISIP and the contractor shall conduct regular audits – quarterly and annual, to the ESMP to ensure that the system for implementation of the ESMMP is operating effectively. The audit shall check that a procedure is in place to ensure that:

- Environmental, Social, Health and Safety Systems are in place and operational during the project implementation, and identify any gaps for improvement;

- The ESMMP being used is the up-to-date version;
- Variations to the ESMP and non-compliance and corrective action are documented;
- Appropriate Environmental, Social, Occupational Health and Safety trainings of personnel is undertaken;
- Emergency and safety procedures are in place and effectively communicated to personnel;
- A register of major incidents is in place and other documentation related to the ESMMP; and
- Ensure that appropriate corrective and preventive action is taken by the Contractor once instructions have been issued.

8.4 Responsibilities for the Implementation of the ESMMP

In order to ensure the sound development and effective implementation of the ESMMP, it will be necessary to identify and define the responsibilities and authority of the various persons and organisations that will be involved in the project. The following entities will be involved in the implementation of the ESMMP:

- Kenya Informal Settlement Improvement Project (KISIP)
- National Environment Management Authority;
- Supervising Consultant;
- Contractor(s);
- Directorate of Safety and Health Services (DOSHS);
- Taita Taveta County

8.4.1 Kenya Informal Settlement Improvement Project (KISIP)

KISIP will be responsible for:

- Overseeing or appointing qualified and competent team to oversee environmental, social, health and safety (EHS) during the Project cycle;
- Review and approve Contractor's Environmental and Social Management Plan (CESMP);
- Carry out targeted NCL (ESHS) training to the Supervision Consultant and contractor's teams;
- Regular monitoring (monthly) and supervision of Implementation of the ESMP;
- Carry out regular compliance ESHS audits including developing corrective action plans;
- Ensuring that during construction and operations, the NEMA license conditions are adhered to since it's the principal holder of NEMA license.

8.4.2 National Environment Management Authority (NEMA)

The responsibility of the National Environment Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment and to ensure that all mitigation measures proposed are implemented.

8.4.3 The Contractor(s)

The Contractor will be responsible for:

- Preparing a Contractor's Environmental and Social Management Plan (CESMP) that will comply with the requirements of the ESIA/ESMMP and the Standard Specifications for road works in Kenya, which include specifications for environmental and social protection and waste disposal, borrow pit and quarry acquisition and exploitation, landscaping and grassing among others;

- Carry out environmental and social assessment for the project auxiliary sites;
- Operationalize, monitor and report on the implementation of the CESMP on monthly and quarterly basis (or as required by the Supervision consultant and KPA);
- Employ competent and qualified separate environmental and social experts on fulltime basis to manage and monitor implementation of CESMP;
- Employ fulltime personnel to manage Occupational Health and Safety issues for the entire duration of the project; and
- Report any environmental, social, health and safety incidents to the Supervision Consultant.
- Prepare the following document: Code of Conduct, Emergency Preparedness and Response Plan, Healthy and Safety Plan, Grievance Redress Mechanism, Gender based violence Sexual Exploitation and Response Plan, Waste Management Plan, Biodiversity Monitoring Plan, stakeholder engagement Plan and Traffic Management Plan.

8.4.4 Supervising Consultant

The Supervising Consultant will be responsible for:

- Oversee the construction programme and construction activities performed by the Contractor, in compliance with the ESMMP;
- Employ qualified full time Environmental and Social Specialists in its team to coordinate all aspects of the environment and social during project implementation;
- Review and approve the CESMP and other associated plans (e.g., rehabilitation/decommissioning plans);
- Daily and regular monitoring, reviewing and verifying the implementation of the project's ESMMP by the contractor;
- Proposing additional appropriate mitigation measures that may be required during the project's implementation;
- Keep track of project compliance regarding permits and approvals necessary from the relevant authorities;
- Conducting and coordinating training to the contractor's team on issues relating to environmental and social issues; and
- Report on monthly and quarterly reports (or as required) on the ESMMP aspects throughout the project implementation duration.

8.4.5 Directorate of Safety and Health Services (DOSHS)

DOSH will be responsible for:

- Registering and permitting of work place for all the work sites and camp sites for the project;
- Inspection and auditing of workplaces to ensure they are adhering to OSHA 2007; and
- Receiving and investigating any severe incidents reported on worksites.

8.4.6 Taita Taveta County Government

The County Governments are created in Chapter Eleven of the Constitution with powers, functions and responsibilities to deliver services provided for in the County Governments Act, 2012. The National and county governments will collaborate in the implementation of KISIP through the respective PCTs. The relevant departmental offices in the County Government shall be called upon to facilitate the project implementation to provide the necessary permits and advisory services to the project implementers. Moreover, the maintenance of the proposed infrastructure will largely lie within the mandate of the County Governments.

8.5 Mitigation of Design Stage Impacts

The Impact Mitigation Plan summarised below reflects respective action at the design, construction and operation phases of the Project. The field works were undertaken by sober and serious minded survey teams were selected and sensitized on the need to observe safety requirements during enumeration and site surveys and this has greatly mitigated incidence of accidents.

8.6 ESMMP

8.6.1 ESMMP for Preconstruction Stage

8.6.1.1 ESMMP for Roads, footpaths

Environmental impact	Impact level	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Performance	Frequency	Estimated Cost
	Environmental						
Approval from NEMA and other Agencies for ESIA report	Medium	The Proponent shall ensure that all pertinent permits, certificates, and licenses have been obtained prior to any activities commencing on- site and are strictly adhered to.	Environment licenses Degree of completion of set of required approvals/ permits issued	County Government of Taita Taveta Contractor	EIA/ Number of EIA Permits obtained	Project Cycle	250,000.00
Clearance of Corridors	Medium	In line with the provisions of the RPF, prepare and effectively implement a plan for managing the land-related impacts. Facilitate all affected persons and address all grievances prior to commencing works.	Displacements Number of facilitated PAPs	County Government of Mombasa Consultant KISIP	Visibly marked road reserve	During designing time and construction	242,000.00
	Social impacts						
Divided opinion on project implementations	Medium	Conduct extensive public participation and consultation with key stakeholders	Public opinion, Satisfaction to the relevant authority	Consultant GRC SEC KISIP	-Total project support by all	Throughout all stages from onset	200,000.00
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	Low	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation	Number of public participation forums held.	KISIP Contactor Consultant GRC EC	SEC/GRC meetings	During designing Stage	250,000.00

		forums.					

8.6.1.2 ESMMP for Drainages

Environmental impact	Impact level	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Performance	Frequency	Estimated Cost
Environmental							
Approval from NEMA and other Agencies for ESIA report	Medium	The Proponent shall ensure that all pertinent permits, certificates, and licenses have been obtained prior to any activities commencing on- site and are strictly adhered to.	Environment licenses Degree of completion of set of required approvals/ permits issued	County Government of Taita Taveta Contractor	EIA/ Number of EIA Permits obtained	Project Cycle	250,000.00
Clearance of Corridors	Medium	In line with the provisions of the RPF, prepare and effectively implement a plan for managing the land-related impacts. Facilitate all affected persons and address all grievances prior to commencing works.	Displacements Number of facilitated PAPs	County Government of Taita Taveta Consultant KISIP	Visibly marked road reserve	During designing time and construction	242,000.00
Social impacts							
Divided opinion on project implementations	Medium	Conduct extensive public participation and consultation with key stakeholders	Public opinion, Satisfaction to the relevant authority	Consultant GRC SEC KISIP	-Total project support by all	Throughout all stages from onset	200,000.00
Risk of excluding some beneficiaries due to unfriendly infrastructure	Low	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation	Number of public participation forums held.	KISIP Contactor Consultant GRC EC	SEC/GRC meetings	During designing Stage	250,000.00

designs		forums.					

8.6.1.3 ESMMP for Streetlights

Environmental impact	Impact level	Proposed Mitigation Measures	Monitoring Indicators	Responsibility	Performance	Frequency	Estimated Cost
Environmental							
Approval from NEMA and other Agencies for ESIA report	Medium	The Proponent shall ensure that all pertinent permits, certificates, and licenses have been obtained prior to any activities commencing on- site and are strictly adhered to.	Environment licenses Degree of completion of set of required approvals/ permits issued	County Government of Taita Taveta Contractor	EIA/ Number of EIA Permits obtained	Project Cycle	250,000.00
Clearance of Corridors	Medium	In line with the provisions of the RPF, prepare and effectively implement a plan for managing the land-related impacts. Facilitate all affected persons and address all grievances prior to commencing works.	Displacements Number of facilitated PAPs	County Government of Taita Taveta Consultant KISIP	Visibly marked road reserve	During designing time and construction	242,000.00
Social impacts							
Divided opinion on project implementations	Medium	Conduct extensive public participation and consultation with key stakeholders	Public opinion, Satisfaction to the relevant authority	Consultant GRC SEC KISIP	-Total project support by all	Throughout all stages from onset	200,000.00
Risk of excluding some beneficiaries due to unfriendly infrastructure	Low	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation	Number of public participation forums held.	KISIP Contactor Consultant GRC EC	SEC/GRC meetings	During designing Stage	250,000.00

designs		forums.					

8.6.2 ESMMP for Construction Phase

8.6.2.1 ESMMP for Roads and footpaths

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Environmental						
Noise pollution and Excessive Vibrations	Moderate	Enforce EMCA 1999, Revised 2015 (Noise and Excessive Vibrations Regulations of 2009) Maintain noise level within acceptable limits (55 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible,be confined to normal working hours in the residential areas Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity Undertake Noise and Excessive Vibration Assessments Effective use of appropriate PPE (earmuffs) for exposed workers. Proper maintenance of machines. Record and communicated to the Supervising Engineer all noise and excess vibration	Reported complaints from neighbour community and institutions Records of machine and vehicle maintenance Availability and use of Ear Muffs	Environmental Consultants Contractor	Continuous	400,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		complains for appropriate action.				
Air pollution	Moderate	Maintain a speed limit of 20km/h within the site during construction phase to reduce dust particles emission. Use of environmentally friendly fuels such as Low Sulphur diesel. Regular maintenance and service of construction machinery and equipment in accordance to manufacturer specifications to minimize the generation of hazardous gases. Providing PPEs such as nose masks to the workers in dusty areas on the site. Maintain regular training of all personnel on methods for minimizing air quality impacts during construction. Ensure a strict schedule plan for all equipment to avoid unnecessary trips and minimize idling of engines. Enforce of EMCA 2015 (AirQuality Regulations 2014) Avoid carrying out dust generating activities especially during strong winds Use of covered trucks for material delivery to avoid	Cases of respiratory complication at nearby health centre. Records of machine and vehicle maintenance Low dust generation during construction Availability and use of Nose Masks	Environmental Consultants Contractor	Continuous	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		spills and windblown dust Communicate air quality monitoring results to the public and address concerns proactively. Monitor air quality in the construction area and surrounding neighborhood. Spraying of all earthwork's areas within 200 meters of human settlement to reduce dust.				
Water Pollution	Low	Implement best management practices for construction activities to prevent runoff contamination. Ensure al machineries are serviced at a dedicated service bay to avoid spillages of oil and other fluids Implement erosion control measures to prevent soil runoff into water bodies. Regularly monitor water quality in nearby water bodies during construction and implementing corrective measures. Collaborate with local water authorities to ensure compliance with water quality standards	Water Quality Reports Records of machine and vehicle	Environmental Management Team Water Quality Experts	Throughout Project	500,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Soil pollution / Erosion	Low	Implement soil erosion control measures to prevent the release of contaminants during construction. Regularly monitor soil quality in construction areas and implement corrective measures. Collaborate with environmental agencies to ensure compliance with soil quality standards.	Ground cover in Constructed areas	Environmental Management Team/consultant Contractor	Monthly	400,000.00
Waste Generation	Moderate	Implement a waste management plan, including proper disposal and recycling of construction waste. Educate construction workers on responsible waste disposal practices. Monitor waste generation and disposal practices to ensure compliance with the waste management plan. Practice waste recycling, re use and reduction of waste generation	Clean, Organized, Neat Site Presence of waste collection receptacle Contract with NEMA Registered Waste Disposal Firm	Environmental Management Contractor	Throughout Project	500,000.00
Social Risks						
Sexual Exploitation and Abuse	Low Medium	Implement an awareness and prevention program for project workers and the local community. Provide access to HIV testing and counselling services, ensuring confidentiality and non-discrimination.	HIV/AIDS awareness trainings Availability of VCT facilities Social awareness and trainings	Sociologists Environmental and Safety Management Manager Contractor	Throughout Project	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Establish a support system for individuals living with HIV/AIDS, promoting inclusivity and reducing stigma. Alias with local security administration for insecurity management				
Occupational Safety and Health issues	Moderate	Enforce strict safety protocols and provide regular training for all construction personnel. Conduct routine safety inspections and audits to identify and address potential hazards. Establish an emergency response plan to handle accidents promptly and efficiently. Provide all workers with appropriate full protective gear. These include working boots, overalls, helmets, earmuffs, masks, and gloves. Make available a fully equipped First aid kit that is manageable by a trained qualified first aider. Use of signage's at work construction site for communication to non-workers and other road users Conduct regular training Document all near misses, incidents and accidents. Conduct risk assessments for all general, standard and high risk jobs	Accidents occurrence incidences recorded in the Incidence Book Workers have Safety Gear(PPEs) Emergency contacts for Hospital and Police available	Environmental and Safety Management Manager Contractor	Weekly	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Engage only qualified personnel on operating or conducting high risk jobs Issue work permits after risk assessment is successfully and all workers verified to be fit for work Conduct physical fitness test regularly for all worker Report all work related injuries and health concerns for action to be taken				
Child Exploitation and Abuse	Medium	Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws. Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police. Employ workers who are 18 years and above, and with a valid national ID at the time of hire. Implement and monitor the employment register regularly. Comply with the national labor laws and labour management practices. Put visible signage on site “No Jobs for children.”	List of workers that does not contain underage persons	SEC GRC Contractor	Daily	200,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Increased Crime and Insecurity	Very High	Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices	Availability of security officers Number of security concerns reported.	Environmental and Safety Management Manager Taita Taveta County Traffic Department Officials	Daily	900,000.00
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.	Number of stakeholders involved and proof of their support.	Contractor SEC and GRC County Government officials, Department of Traffic management Environmental And Safety Management Manager	Throughout Project	250,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Low Medium	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive	Number of GBV cases reported and solved. GBV Awareness trainings	SEC GRC Contractor Taita Taveta County Government Officials	Throughout Project	150,000.00
Disruption to Public Services	Low Medium	Coordinate with relevant public service providers to adapt services during construction. Communicate service disruptions in advance to minimize inconvenience for residents. Establish a hotline or platform for residents to report service disruptions and address concerns.	Number of complaints from community due to lack of certain services	Environmental and Safety Management Manager Contractor Relevant County Government department with help of KISIP County coordinator	Throughout Project	100,000.00
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	High	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums	Number of beneficiaries engaged during the public participation meetings	KISIP Contactor Consultant	Initial and Ongoing	200,000.00

8.6.2.2 ESMMP for Drainages

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Environmental						
Noise pollution and Excessive Vibrations	Moderate	Enforce EMCA 1999, Revised 2015 (Noise and Excessive Vibrations Regulations of 2009) Maintain noise level within acceptable limits (55 Decibels during the day and 35 Decibels during the night) and construction activities shall, where possible,be confined to normal working hours in the residential areas Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity Undertake Noise and Excessive Vibration Assessments Effective use of appropriate PPE (earmuffs) for exposed workers. Proper maintenance of machines. Record and communicated to the Supervising Engineer all noise and excess vibration complains for appropriate action.	Reported complaints from neighbour community and institutions Records of machine and vehicle maintenance Availability and use of Ear Muffs	Environmental Consultants Contractor	Continuous	400,000.00
Air pollution	Moderate	Maintain a speed limit of 20km/h within the site during construction phase to reduce dust particles	Cases of respiratory complication at nearby health centre.	Environmental Consultants Contractor	Continuous	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		emission. Use of environmentally friendly fuels such as Low Sulphur diesel. Regular maintenance and service of construction machinery and equipment in accordance to manufacturer specifications to minimize the generation of hazardous gases. Providing PPEs such as nose masks to the workers in dusty areas on the site. Maintain regular training of all personnel on methods for minimizing air quality impacts during construction. Ensure a strict schedule plan for all equipment to avoid unnecessary trips and minimize idling of engines. Enforce of EMCA 2015 (AirQuality Regulations 2014) Avoid carrying out dust generating activities especially during strong winds Use of covered trucks for material delivery to avoid spills and windblown dust Communicate air quality monitoring results to the public and address concerns proactively. Monitor air quality in the construction area and	Records of machine and vehicle maintenance Low dust generation during construction Availability and use of Nose Masks			

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		surrounding neighborhood. Spraying of all earthwork's areas within 200 meters of human settlement to reduce dust.				
Water Pollution	Low	Implement best management practices for construction activities to prevent runoff contamination. Ensure al machineries are serviced at a dedicated service bay to avoid spillages of oil and other fluids Implement erosion control measures to prevent soil runoff into water bodies. Regularly monitor water quality in nearby water bodies during construction and implementing corrective measures. Collaborate with local water authorities to ensure compliance with water quality standards	Water Quality Reports Records of machine and vehicle	Environmental Management Team Water Quality Experts	Throughout Project	500,000.00
Soil pollution / Erosion	Low	Implement soil erosion control measures to prevent the release of contaminants during construction. Regularly monitor soil quality in construction areas and implement corrective measures. Collaborate with environmental agencies to ensure compliance with soil quality standards.	Ground cover in Constructed areas	Environmental Management Team/consultant Contractor	Monthly	400,000.00
Waste Generation	Moderate	Implement a waste management plan, including proper disposal and recycling of construction waste.	Clean, Organized, Neat Site Presence of waste collection	Environmental Management	Throughout Project	500,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Educate construction workers on responsible waste disposal practices. Monitor waste generation and disposal practices to ensure compliance with the waste management plan. Practice waste recycling, re use and reduction of waste generation	receptacle Contract with NEMA Registered Waste Disposal Firm	Contractor		
Social Risks						
Sexual Exploitation and Abuse	Low Medium	Implement an awareness and prevention program for project workers and the local community. Provide access to HIV testing and counselling services, ensuring confidentiality and non-discrimination. Establish a support system for individuals living with HIV/AIDS, promoting inclusivity and reducing stigma. Alias with local security administration for insecurity management	HIV/AIDS awareness trainings Availability of VCT facilities Social awareness and trainings	Sociologists Environmental and Safety Management Manager Contractor	Throughout Project	300,000.00
Occupational Safety and Health issues	Moderate	Enforce strict safety protocols and provide regular training for all construction personnel. Conduct routine safety inspections and audits to identify and address potential hazards. Establish an emergency response plan to handle accidents promptly and efficiently. Provide all workers with appropriate full protective	Accidents occurrence incidences recorded in the Incidence Book Workers have Safety Gear(PPEs) Emergency contacts for Hospital and Police available	Environmental and Safety Management Manager Contractor	Weekly	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		gear. These include working boots, overalls, helmets, earmuffs, masks, and gloves. Make available a fully equipped First aid kit that is manageable by a trained qualified first aider. Use of signage's at work construction site for communication to non-workers and other road users Conduct regular training Document all near misses, incidents and accidents. Conduct risk assessments for all general, standard and high risk jobs Engage only qualified personnel on operating or conducting high risk jobs Issue work permits after risk assessment is successfully and all workers verified to be fit for work Conduct physical fitness test regularly for all worker Report all work related injuries and health concerns for action to be taken				
Child Exploitation and Abuse	Medium	Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws. Ensure that any child sexual relations offenses among contractors' workers are promptly reported to	List of workers that does not contain underage persons	SEC GRC Contractor	Daily	200,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		the police. Employ workers who are 18 years and above, and with a valid national ID at the time of hire. Implement and monitor the employment register regularly. Comply with the national labor laws and labour management practices. Put visible signage on site "No Jobs for children."				
Increased Crime and Insecurity	Very High	Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices	Availability of security officers on site	Environmental and Safety Management Manager Taita Taveta County Traffic Department Officials	Daily	900,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.	Number of stakeholders involved and proof of their support.	Contractor SEC and GRC County Government officials, Department of Traffic management Environmental And Safety Management Manager	Throughout Project	250,000.00
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Low Medium	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive	Number of GBV cases reported and solved. GBV Awareness trainings	SEC GRC Contractor Taita Taveta County Government Officials	Throughout Project	150,000.00
Disruption to Public Services	Low Medium	Coordinate with relevant public service providers to adapt services during construction. Communicate service disruptions in advance to minimize inconvenience for residents.	Number of complaints from community due to lack of certain services	Environmental and Safety Management Manager Contractor Relevant County	Throughout Project	100,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Establish a hotline or platform for residents to report service disruptions and address concerns.		Government department with help of KISIP County coordinator		
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	High	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums	Number of beneficiaries engaged during the public participation meetings	KISIP Contactor Consultant	Initial and Ongoing	200,000.00

8.6.2.3 ESMMP for Streetlights

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Environmental						
Waste Generation	Moderate	Implement a waste management plan, including proper disposal and recycling of construction waste. Educate construction workers on responsible waste disposal practices. Monitor waste generation and disposal practices to ensure compliance with the waste management	Clean, Organized, Neat Site Presence of waste collection receptacle Contract with NEMA Registered Waste Disposal Firm	Environmental Management Contractor	Throughout Project	500,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		plan. Practice waste recycling, re use and reduction of waste generation				
Social Risks						
Sexual Exploitation and Abuse	Low Medium	Implement an awareness and prevention program for project workers and the local community. Provide access to HIV testing and counselling services, ensuring confidentiality and non-discrimination. Establish a support system for individuals living with HIV/AIDS, promoting inclusivity and reducing stigma. Alias with local security administration for insecurity management	HIV/AIDS awareness trainings Availability of VCT facilities Social awareness and trainings	Sociologists Environmental and Safety Management Manager Contractor	Throughout Project	300,000.00
Occupational Safety and Health issues	Moderate	Enforce strict safety protocols and provide regular training for all construction personnel. Conduct routine safety inspections and audits to identify and address potential hazards. Establish an emergency response plan to handle accidents promptly and efficiently. Provide all workers with appropriate full protective gear. These include working boots, overalls, helmets, earmuffs, masks, and gloves.	Accidents occurrence incidences recorded in the Incidence Book Workers have Safety Gear(PPEs) Emergency contacts for Hospital and Police available	Environmental and Safety Management Manager Contractor	Weekly	300,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Make available a fully equipped First aid kit that is manageable by a trained qualified first aider. Use of signage's at work construction site for communication to non-workers and other road users Conduct regular training Document all near misses, incidents and accidents. Conduct risk assessments for all general, standard and high risk jobs Engage only qualified personnel on operating or conducting high risk jobs Issue work permits after risk assessment is successfully and all workers verified to be fit for work Conduct physical fitness test regularly for all worker Report all work related injuries and health concerns for action to be taken				
Child Exploitation and Abuse	Medium	Ensure each employee signs a code of conduct that covers child protection ensuring no children are employed on site in accordance with national labour laws. Ensure that any child sexual relations offenses among contractors' workers are promptly reported	List of workers that does not contain underage persons	SEC GRC Contractor	Daily	200,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		to the police. Employ workers who are 18 years and above, and with a valid national ID at the time of hire. Implement and monitor the employment register regularly. Comply with the national labor laws and labour management practices. Put visible signage on site "No Jobs for children."				
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.	Number of stakeholders involved and proof of their support.	Contractor SEC and GRC County Government officials, Department of Traffic management Environmental And Safety Management Manager	Throughout Project	250,000.00

Possible Impact	Impact Rating level	Management Actions	Monitoring Indicators	Target Areas and Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Low Medium	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive	Number of GBV cases reported and solved. GBV Awareness trainings	SEC GRC Contractor Taita Taveta County Government Officials	Throughout Project	150,000.00
Disruption to Public Services	Low Medium	Coordinate with relevant public service providers to adapt services during construction. Communicate service disruptions in advance to minimize inconvenience for residents. Establish a hotline or platform for residents to report service disruptions and address concerns.	Number of complaints from community due to lack of certain services	Environmental and Safety Management Manager Contractor Relevant County Government department with help of KISIP County coordinator	Throughout Project	100,000.00
Risk of excluding some beneficiaries due to unfriendly infrastructure designs	High	The implementation of the infrastructure assumed universal design. Disseminate this information to the beneficiaries through public participation forums	Number of beneficiaries engaged during the public participation meetings	KISIP Contactor Consultant	Initial and Ongoing	200,000.00

8.6.3 ESMMP for Operational Phase

8.6.3.1 ESMMP for Roads and footpaths

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Medium high	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive.	Number of GBV cases reported and solved. GBV Awareness trainings	County Government of Taita Taveta; Department of Traffic management, KISIP	Throughout Project	No additional cost
Ineffective Grievance Management	Very High	Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms. Implement a workers' grievances mechanism. Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs. Log, date, process, resolve, and close-out all reported grievances in a timely manner. Ensure proportionate representation of disadvantaged persons in the local grievances committee.	Awareness trainings conducted Grievance complaints documentation Availability of a GRM and SEC committee	County Government of Taita Taveta, KISIP, Contractor	Throughout Project	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.				
Water Pollution/Contamination	Very Low	Prioritize integrated water management approaches that address both the root causes and symptoms of pollution. Investing in infrastructure for safe drinking water supply, wastewater treatment, and solid waste management Promoting sustainable agricultural practices to reduce runoff and pollution Strengthening regulatory frameworks and enforcement mechanisms to prevent industrial pollution, and raising awareness about the importance of water conservation and pollution prevention among community members. Taking proactive measures to protect water resources	Water quality standards and tests	SEC, GRC, KISIP	Ongoing	No additional cost
Inadequate stakeholder Engagement and Exclusion of disadvantaged and	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.	Number of stakeholders involved and proof of their support.	SEC, GRC, KISIP	Monthly	200,000.00

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
vulnerable groups		Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.				

8.6.3.2 ESMMP for Drainages

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Medium high	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive.	Number of GBV cases reported and solved. GBV Awareness trainings	County Government of Taita Taveta; Department of Traffic management, KISIP	Throughout Project	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Ineffective Grievance Management	Very High	Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms. Implement a workers' grievances mechanism. Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs. Log, date, process, resolve, and close-out all reported grievances in a timely manner. Ensure proportionate representation of disadvantaged persons in the local grievances committee. Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.	Awareness trainings conducted Grievance complaints documentation Availability of a GRM and SEC committee	County Government of Taita Taveta, KISIP, Contractor	Throughout Project	No additional cost
Water Pollution/Contamination	Very Low	Prioritize integrated water management approaches that address both the root causes and symptoms of pollution. Investing in infrastructure for safe drinking water supply, wastewater	Water quality standards and tests	SEC, GRC, KISIP	Ongoing	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		treatment, and solid waste management Promoting sustainable agricultural practices to reduce runoff and pollution Strengthening regulatory frameworks and enforcement mechanisms to prevent industrial pollution, and raising awareness about the importance of water conservation and pollution prevention among community members. Taking proactive measures to protect water resources				
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups. Develop and implementation of a stakeholder engagement plan.	Number of stakeholders involved and proof of their support.	SEC, GRC, KISIP	Monthly	200,000.00

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.				
Alteration of Natural Drainage Patterns	Very Low	Conduct detailed hydrological studies to understand natural drainage patterns. Design drainage systems that mimic natural flow to reduce environmental impact		SEC, GRC, KISIP	Quarterly	200,000.00

8.6.3.3 ESMMP for Streetlights

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Gender-Based Violence and Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	Medium high	Develop and implement a plan to manage the risk of SEA/SH. Map the GBV referral pathways and create awareness among women and men on the risk of SEA/SH. Ensure the GRM is SEA/SH-responsive.	Number of GBV cases reported and solved. GBV Awareness trainings	County Government of Taita Taveta; Department of Traffic management, KISIP	Throughout Project	No additional cost

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
Ineffective Grievance Management	Very High	Constitute a Local Grievances Committee in consultation with all community segments and incorporate the existing local dispute resolution mechanisms. Implement a workers' grievances mechanism. Create awareness on the culturally appropriate and accessible GRM to all community segments including vulnerable individuals and households and CSOs. Log, date, process, resolve, and close-out all reported grievances in a timely manner. Ensure proportionate representation of disadvantaged persons in the local grievances committee. Enable the GRM to provide for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.	Awareness trainings conducted Grievance complaints documentation Availability of a GRM and SEC committee	County Government of Taita Taveta, KISIP, Contractor	Throughout Project	No additional cost
Energy Consumption	Low Medium	A programmable timer shall control exterior lights. Generator should be provided as a full backup energy source throughout the development. Install and routine maintenance of energy	Reduced and conservative use of energy	County Government of Taita Taveta, KISIP, Contractor	Throughout Project	300,000.00

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		efficient appliances e.g. LED bulbs etc. Monitor energy use during construction and set reasonable limit. Put off all lights immediately when not in use or are not needed. The water booster set will contain inverter pumps for energy saving and precise control of flow and pressure rate. Turn off machinery and equipment when not in use. Use of solar energy as an alternative source of energy at contractor's camp sites.				
Inadequate stakeholder Engagement and Exclusion of disadvantaged and vulnerable groups	Medium high	Share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums. Introduce measures for affirmative action that would ensure especially persons with disability, the elderly and women have access to job opportunities. Undertake recruitment transparently, while ensuring the inclusion of disadvantaged groups.	Number of stakeholders involved and proof of their support.	SEC, GRC, KISIP	Monthly	200,000.00

Possible Impact,	Impact Rating Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget(KShs)
		Develop and implementation of a stakeholder engagement plan. Engage stakeholders throughout the project phase as guided by the approved stakeholder engagement plan.				
Light and Visual discomfort	Medium High	Properly design and angle light fixtures to minimize glare. Consider installing light shields or diffusers to control light direction. Seek aviation lighting design principles Use shielded fixtures and directional lighting to minimize light spillage. Implement curfew times for non-essential lighting. Educate the community on responsible lighting practices.		SEC, GRC, KISIP	Throughout Project	No additional cost
Disturbance to Nocturnal Wildlife	Very Low	Install motion sensors or timers to reduce lighting intensity during periods of low activity. Choose warm-coloured lights that are less disruptive to wildlife.		SEC, GRC, KISIP	Throughout Project	No additional cost

8.6.4 ESMMP for Decommissioning Phase

8.6.4.1 ESMMP for Roads and footpaths

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Disruption of Services	Low Medium	Implement phased decommissioning to minimize disruption to services. Provide alternative routes or transportation options for affected commuters. Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.	Number of services affected Duration of service disruptions. Percentage of planned versus unplanned disruptions.	SEC, GRC, KISIP, County Government of Taita Taveta	Throughout Decommissioning	No additional cost
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	Compliance with environmental regulations and permits. Inspection frequency and compliance with erosion control practices Survival rates of replanted native vegetation	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	To be established
Waste Generation	*Low Medium*	Implement recycling and reuse programs for materials like concrete and asphalt. Properly dispose of hazardous materials in accordance with regulations.	Adoption rate of recycled materials in new construction projects Compliance with hazardous waste disposal regulations Implementation of practices to reduce packaging waste,	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	250,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.	excess materials, and unnecessary disposal.			
Economic Loss	Low Medium	Provide support and incentives for local businesses affected by decommissioning. Offer compensation or assistance programs to mitigate financial losses. Develop alternative economic opportunities or infrastructure projects to offset any negative economic impacts.	Service disruption metrics and traffic flow management. Compliance with environmental regulations and effectiveness of restoration efforts. Quantity of recycled materials, hazardous waste disposal compliance, and waste reduction. Number of businesses supported, financial assistance effectiveness, and economic diversification progress.	KISIP,SEC,GRC	Throughout Decommissioning	100,000.00
Health and Safety Concerns	Medium	Enforce strict safety regulations and provide adequate training for workers. Implement dust and noise control measures to minimize pollution and disturbance to nearby residents. Communicate potential risks to the public and provide guidance on safety precautions.	Adherence to safety regulations and incident rates. Monitoring dust and noise levels, and compliance with pollution limits. Public awareness and feedback on risk communication effectiveness.	KISIP,SEC,GRC	Throughout Decommissioning	200,000.00
Environmental	Low	Conduct thorough environmental impact	Completion and compliance	Environmental	Throughout	300,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Disturbance	Medium	assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	of environmental impact assessments. Effectiveness of erosion and sediment control measures. Success of habitat restoration and native vegetation replanting. Water quality monitoring results. Stakeholder feedback on environmental impacts and restoration efforts. Adherence to environmental regulations and reporting requirements.	Management Team/Consultant, KISIP	Decommissioning	

8.6.4.2 ESMMP for Drainages

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Disruption of Services	Low Medium	Implement phased decommissioning to minimize disruption to services. Provide alternative routes or transportation options for affected commuters.	Number of services affected Duration of service disruptions. Percentage of planned versus unplanned disruptions.	SEC, GRC, KISIP, County Government of Taita Taveta	Throughout Decommissioning	No additional cost

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.				
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	Compliance with environmental regulations and permits. Inspection frequency and compliance with erosion control practices Survival rates of replanted native vegetation	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	To be established
Waste Generation	*Low Medium*	Implement recycling and reuse programs for materials like concrete and asphalt. Properly dispose of hazardous materials in accordance with regulations. Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.	Adoption rate of recycled materials in new construction projects Compliance with hazardous waste disposal regulations Implementation of practices to reduce packaging waste, excess materials, and unnecessary disposal.	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	250,000.00
Economic Loss	Low Medium	Provide support and incentives for local businesses affected by decommissioning. Offer compensation or assistance programs to mitigate financial losses. Develop alternative economic	Service disruption metrics and traffic flow management. Compliance with environmental regulations and effectiveness of restoration efforts. Quantity of recycled	KISIP,SEC,GRC	Throughout Decommissioning	100,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		opportunities or infrastructure projects to offset any negative economic impacts.	materials, hazardous waste disposal compliance, and waste reduction. Number of businesses supported, financial assistance effectiveness, and economic diversification progress.			
Health and Safety Concerns	Medium	Enforce strict safety regulations and provide adequate training for workers. Implement dust and noise control measures to minimize pollution and disturbance to nearby residents. Communicate potential risks to the public and provide guidance on safety precautions.	Adherence to safety regulations and incident rates. Monitoring dust and noise levels, and compliance with pollution limits. Public awareness and feedback on risk communication effectiveness.	KISIP,SEC,GRC	Throughout Decommissioning	200,000.00
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	Completion and compliance of environmental impact assessments. Effectiveness of erosion and sediment control measures. Success of habitat restoration and native vegetation replanting. Water quality monitoring results. Stakeholder feedback on	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	300,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
			environmental impacts and restoration efforts. Adherence to environmental regulations and reporting requirements.			

8.6.4.3 ESMMP for Street lighting

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Disruption of Services	Low Medium	Implement phased decommissioning to minimize disruption to services. Provide alternative routes or transportation options for affected commuters. Schedule decommissioning activities during off-peak hours to reduce impact on traffic flow.	Number of services affected Duration of service disruptions. Percentage of planned versus unplanned disruptions.	SEC, GRC, KISIP, County Government of Taita Taveta	Throughout Decommissioning	No additional cost
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	Compliance with environmental regulations and permits. Inspection frequency and compliance with erosion control practices Survival rates of replanted native vegetation	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	To be established
Waste Generation	*Low Medium*	Implement recycling and reuse programs for materials like concrete and asphalt. Properly dispose of hazardous materials in accordance with regulations. Encourage contractors to minimize waste generation through efficient construction and decommissioning practices.	Adoption rate of recycled materials in new construction projects Compliance with hazardous waste disposal regulations Implementation of practices to reduce packaging waste, excess materials, and unnecessary disposal.	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	250,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
Economic Loss	Low Medium	Provide support and incentives for local businesses affected by decommissioning. Offer compensation or assistance programs to mitigate financial losses. Develop alternative economic opportunities or infrastructure projects to offset any negative economic impacts.	Service disruption metrics and traffic flow management. Compliance with environmental regulations and effectiveness of restoration efforts. Quantity of recycled materials, hazardous waste disposal compliance, and waste reduction. Number of businesses supported, financial assistance effectiveness, and economic diversification progress.	KISIP,SEC,GRC	Throughout Decommissioning	100,000.00
Health and Safety Concerns	Medium	Enforce strict safety regulations and provide adequate training for workers. Implement dust and noise control measures to minimize pollution and disturbance to nearby residents. Communicate potential risks to the public and provide guidance on safety precautions.	Adherence to safety regulations and incident rates. Monitoring dust and noise levels, and compliance with pollution limits. Public awareness and feedback on risk communication effectiveness.	KISIP,SEC,GRC	Throughout Decommissioning	200,000.00
Environmental Disturbance	Low Medium	Conduct thorough environmental impact assessments prior to decommissioning. Implement erosion and sediment control	Completion and compliance of environmental impact assessments. Effectiveness of erosion and	Environmental Management Team/Consultant, KISIP	Throughout Decommissioning	300,000.00

Possible Impact	Impact Level	Management Actions	Monitoring Indicators	Responsibilities	Monitoring Frequency	Estimated Budget (KShs)
		measures to prevent soil erosion and water pollution. Replant native vegetation and restore habitats affected by decommissioning activities.	sediment control measures. Success of habitat restoration and native vegetation replanting. Water quality monitoring results. Stakeholder feedback on environmental impacts and restoration efforts. Adherence to environmental regulations and reporting requirements.			

9. GRIEVANCE REDRESS MECHANISM

This section describes the project's Grievance Redress Mechanism. The overall objective of the GRM is to establish an effective communication channel among project stakeholders for providing a timely and efficient two-way feedback mechanism to address any grievances and complaints against the project from multiple stakeholders and Project Affected. This GRM complies with the Law of Kenya and international best practices. During the proposed implementation of Upper Kariokor projects, grievances, complaints as well as disputes are expected to arise from several stages of the project including design and implementation phase.

Effective and timely response to community complaints is essential for maintaining good community relations. KISIP is committed to having an effective complaint handling system that reflects the needs, expectations and rights of complainants.

9.1 Objectives of the GRM

The project implementation team will work to prevent grievances through the implementation of proposed mitigation measures as per the ESMMP and as identified through the Grievance Redress Mechanism (GRM). Specific objectives of the GRM are:

- To ensure that comments, responses and grievances are handled in a fair and transparent manner in line with KISIP internal mechanisms;
- To structure and manage the handling of comments, responses and grievances, and allow monitoring of effectiveness of the mechanism;
- To provide stakeholders in general with a clear process for providing comment and raising grievances; and
- To provide a platform for stakeholders to raise comments and concerns.

9.2 Proposed Grievance Redress Procedure

The Chief Grievance Handling Officer will be the Resident Engineer (RE). Everybody else, members of GRC, will acts on RE's behalf and reports to him/her. Anyone will be able to submit a grievance to the project, if they believe any practice by the project is having a detrimental impact on the community, the environment, or on their quality of life. They may also submit comments and suggestions on how such issues can be handled or prevented. Stakeholder sensitization on the GRM will be undertaken during stakeholder meetings scheduled under the project's Stakeholder Engagement Plan.

Table 63:GRC Guiding Principles

Guiding Principles	Description
Fairness	The grievance redress system treats complainants with respect and courtesy. The rules of natural justice apply, and all parties involved have the opportunity to respond to raised issues.
Transparency and Accessibility	The complaints handling system is well-known to stakeholders, staff, and contractors. It includes information on the right to complain, the process, locations, and how complaints will be handled. Details are easily accessible, and there is no charge for complainants. The system aims to be easy to understand, use, and presented in plain language. Interpreter services are provided for non-English speakers if possible.
Responsiveness	Complaints are dealt with quickly, courteously, and fairly within established timelines. Complainants are informed of the expected resolution time and kept updated on progress. If additional time is needed, the complainant is notified with reasons for the delay. If unresolved, clear explanations are provided, and alternative actions or review opportunities are offered.
Privacy and Confidentiality	The complaint handling process ensures complainant confidentiality, including cases against staff. Complaint details are limited to those directly concerned.
Accountability	The system is open to public and oversight scrutiny, such as by the Ombudsman. A reporting mechanism on the complaints process is maintained. KISIP maintains a complaints register and conducts regular audits, formulating action plans to address any deficiencies.

The general steps of the grievance process have been summarized in Table 4 below and comprise:

14. Registration/receipt/Acknowledgment of Complaints
4. Investigate and determine solution to the complaint
5. Implementing the Redress Action;
6. Verifying the Redress Action;
7. Monitoring and Evaluation; and
8. Recourse or Alternatives

Table 64: Grievance Redress Mechanism

Step	Process	Description	Timeframe	Responsibility
1	Grievance receipt and registration/ logging	Face to face; phone; letter, recorded during public/community meetings; WhatsApp etc. Significance assessed and grievance recorded or logged using the model complaint form and filed.	1-2 Days	An aggrieved party or PAPs Lodging complaint to the GRC. GRCs- Receive, registering and logging grievances
2	Development and implementation of response	GRC meets or takes a decision on the grievance. Grievance assigned to appropriate party for resolution if necessary. Response development with input from relevant stakeholders. Redress response/action approved by GRC and logged. Redress response/update of progress on resolution communicated to the complainant. Start implementing redress action	5- 10 Days	GRC
3	Verifying the implementation of redress action	Redress action implemented and verified by GRC. GRC satisfied with implementation of redress action. Complainant duly signed the grievance resolution form	10-15 Days	Environmental (Social) Officer/Safeguard Specialist at the County level (CPCT)
4	Close grievance or refer grievance to 2nd tier resolution	Completion of redress action recorded or logged. Confirm with complainant that grievance can be closed or determine what follow up is necessary. Record final sign off of grievance. If grievance cannot be closed, return to step 2 or recommend to the next tier- County, National.	15-25 Days	Environmental (Social) Officer/Safeguard Specialist at the County level (CPCT)/ Grievance Officer

Step	Process	Description	Timeframe	Responsibility
5	Court of law	If 2nd and third level settlement does not address dispute, complainant can resort to court of law	Unknown	Safeguard Specialist under KISIP 2 at the National level (NPCT)
6	Monitoring and evaluation, and reporting	Grievance Redress Mechanism Process is documented and monitored		Safeguard Specialist under KISIP 2 at the National level (NPCT)

9.3 The Three Tier of Grievance Redress Mechanism

The three-tier grievance redressal mechanism refers to a structured approach used by organizations or governments to address and resolve complaints or grievances raised by individuals or groups. These are;

Informal Resolution

This initial tier involves resolving grievances through informal means, such as direct communication between the aggrieved party and the concerned individual or department. It may include discussions, meetings, or informal mediation to resolve the issue before it escalates further. The goal here is to address the grievance swiftly and amicably without formal procedures.

Formal Resolution

If the grievance is not resolved at the informal level or if it is of a serious nature, it moves to the formal resolution tier. Formal resolution often involves submitting a written complaint or grievance through designated channels within the organization or institution. This tier may include a structured investigation process, hearings, or meetings with designated grievance redressal authorities. The decision or resolution at this level is typically documented and communicated to the parties involved.

Appellate or Escalation Level

If the aggrieved party is not satisfied with the resolution provided at the formal level, they may have the option to escalate the matter to a higher authority or an appellate body. This tier involves a review of the previous decisions or actions taken, and it may include a reconsideration of the grievance based on new evidence or arguments presented. The appellate or escalation level provides a final opportunity for a fair and impartial review of the grievance before a decision is made.

These tiers ensure that grievances are addressed through a systematic process, starting with informal attempts to resolve issues and escalating to formal procedures and higher authorities if necessary. It aims to provide transparency, accountability, and fairness in resolving complaints within organizations or government bodies.

9.4 Worker Grievance Procedure

Contractor shall commit to enforce KISIP's comprehensive labor and employment policies, including its requirements on workplace discrimination and harassment, across the entire workforce. This policy requires that all contractor workers are to be treated fairly, with dignity and respect, and have equal employment opportunities.

Therefore, contractors shall be required to develop a Labour Management Plan that includes an authorized process for workers to raise grievances and concerns to senior management, covering any issues that are work related, that affect an employee or contractor, or that an employee deems unfair. Such concerns may relate (but are not limited) to the following:

- Management decisions;
- Occupational health and safety concerns;
- The behavior or conduct of another employee, manager, or contractor; and
- The effects of KISIP's contractors' Human Resources policy or procedures.

Contractor shall ensure that all grievances raised by workers are treated impartially, respectfully and confidentially.

9.5 World Bank Group Grievance Redress Service

The World Bank Group's Grievance Redress Service (GRS) is an essential mechanism for addressing complaints and grievances related to projects funded by the World Bank Group. The GRS aims to provide affected communities, also known as Project Affected People (PAPs), with a platform to voice their concerns and seek resolutions.

Purpose of GRS

The primary purpose of the Grievance Redress Service is to ensure that affected individuals and communities have a voice in projects financed by the World Bank Group. It is designed to address complaints related to social and environmental issues, human rights violations, resettlement concerns, and other project-related grievances.

Types of Complaints

The GRS handles various types of complaints, including but not limited to:

- Social issues: Such as community displacement, loss of livelihoods, cultural heritage preservation.
- Environmental concerns: Such as pollution, deforestation, water contamination.
- Human rights violations: Such as labor rights abuses, discrimination, lack of consultation with affected groups.

PAPs, including individuals, communities, or organizations directly affected by World Bank-funded projects, have the right to lodge a complaint with the GRS. The affected parties can be from both the public and private sectors. Complaints can be lodged through the following;

Identify the Issue: Clearly identify the specific issue or grievance you want to raise. Provide details, evidence, and supporting documents if available.

Contact GRS: PAPs can contact the Grievance Redress Service directly through various channels, such as:

1. GRS Online Platform: Many complaints can be submitted through the World Bank's online grievance portal.
2. Local World Bank Office: In some cases, PAPs can lodge complaints at the local World Bank office responsible for the project.
3. Community Liaison Officers: Some projects have designated Community Liaison Officers who can assist in lodging complaints.

Submit the Complaint: Follow the instructions provided by the GRS for submitting your complaint. Include all relevant information and documents to support your case.

Wait for Acknowledgment: Once the complaint is submitted, the GRS will acknowledge receipt and begin the review process. The review process is as follows;

- **Initial Assessment**: The GRS team conducts an initial assessment of the complaint to determine its validity and relevance to World Bank Group policies and guidelines.
- **Investigation**: If the complaint is deemed valid, the GRS team may conduct further investigations, which may involve site visits, consultations with stakeholders, and gathering additional information.
- **Resolution**: Based on the findings of the investigation, the GRS works toward resolving the complaint through various means, such as mediation, corrective actions, or policy recommendations.
- **Feedback and Follow-up**: Throughout the process, the GRS provides feedback to the complainant and ensures follow-up actions are taken to address the grievances effectively.

Confidentiality and Protection: The GRS respects the confidentiality of complainants and ensures protection against any reprisals or retaliation for lodging a complaint. PAPs' identities are generally kept confidential unless consent is provided otherwise.

Monitoring and Evaluation: After a complaint is resolved, the GRS may conduct monitoring and evaluation to assess the effectiveness of the resolution and identify lessons learned for future projects.

By providing an accessible and transparent platform for addressing grievances, the World Bank Group's Grievance Redress Service plays a crucial role in promoting accountability, transparency, and sustainable development in its funded projects.

9.6 GRM Cost Estimate

Table 65: GRM cost

S/No	Description	Monthly Cost in Kshs	Annual cost
1	GRC facilitation fee for 12 members of the committee	12,000	144,000
2	GRC meeting venue	5,000	60,000
3	Others	10,000	120,000
	TOTAL	**27,000**	**324,000**

The above GRM estimate cost is the rate per month for Upper Kariokor settlement, and is dependent on the total project duration, which is estimated to be 12 months, making the total cost to **Kshs. 324,000.**

10 CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

In conclusion, the Upper Kariokor Settlement Improvement Project holds significant potential to enhance living conditions and promote sustainable development in the area. However, careful consideration of environmental and social impacts, along with robust mitigation measures, is crucial for successful project implementation. Therefore, it is recommended that the project undergo a Comprehensive Project Report to further evaluate potential impacts and develop detailed mitigation plans. Collaboration with relevant stakeholders, adherence to regulatory standards, and continuous monitoring and evaluation are essential for ensuring the project's success and maximizing positive outcomes for both the community and the environment.

10.2 Recommendation

To ensure the successful execution of the project and mitigate the identified impacts, the initiation of a Comprehensive Project Report is strongly recommended. This assessment will serve as a vital tool to thoroughly examine the potential effects on the natural and human environment, propose tailored mitigation measures, and develop an effective Environmental and Social Management and Monitoring Plan (ESMMP). This proactive approach aligns with the project's commitment to environmental sustainability and social responsibility.

Furthermore, considering that the proposed projects fall within the Second Schedule of the Environmental Management and Coordination Act (EMCA) and are categorized under both Category B of the World Bank's environmental screening classification, it is crucial to subject the project to a Comprehensive Project Report. This ensures compliance with regulatory standards and international best practices.

This Comprehensive Project Report, accompanied by a robust ESMMP, not only safeguards against potential negative impacts but also fosters a myriad of benefits. Improved infrastructure will enhance local livelihoods, providing better access to education, healthcare, and economic opportunities. Stakeholders, including the local community, stand to gain from upgraded amenities, increased safety, and enhanced connectivity. The transparent and consultative process embedded in the Comprehensive Project Report also ensures that diverse perspectives are considered, promoting a sense of ownership and shared responsibility.

Road Upgrade

Traffic Management Plan: Develop a comprehensive traffic management plan to minimize disruptions and congestion during the construction phase. Clearly communicate alternative routes to the public.
Community Engagement: Engage with the local community to gather feedback on the proposed road upgrades. Address concerns and keep residents informed about the project's timeline and potential impacts.
Environmental Impact Mitigation: Implement erosion control measures to prevent soil runoff into nearby water bodies. Regularly monitor water quality and collaborate with local water authorities to ensure compliance with standards.
Aesthetic Considerations: Adhere to design guidelines to minimize visual disruption. Utilize temporary screens or barriers to shield construction sites from view. Gather regular feedback from residents to address aesthetic concerns.
Parking Management: Designate alternative parking areas during construction to minimize inconvenience. Clearly communicate parking options to residents and businesses. Monitor and assess the impact on parking availability regularly.

Storm water Drainage Construction:

Environmental Monitoring: Implement dust control measures during construction to mitigate air quality concerns. Regularly monitor air quality in the construction area and communicate results to the public.
Community Awareness: Conduct community sensitization sessions on potential dust and air quality issues. Develop and distribute information, education, and communication (IEC) materials to raise awareness.
Water Quality Management: Collaborate with local water authorities to ensure storm water drainage does not compromise water quality. Implement corrective measures promptly based on regular monitoring.

High-Mast Street Lights Installation

Lighting Design Guidelines: Implement design guidelines to ensure high-mast street lights are installed in a way that minimizes aesthetic impact on surrounding properties. Engage with residents for feedback.
Stakeholder Engagement: Develop a stakeholder engagement plan specifically for the high-mast lights installation. Communicate project information widely and transparently.
Impact on Local Employment: Prioritize hiring locals for unskilled labour during the installation phase. Ensure fair and transparent recruitment processes.
Safety Measures: Implement safety measures during the installation of high-mast lights. Engage with the community to raise awareness and address safety concerns.

Expert position

I strongly recommend the project to be implemented after thorough review, the impact can be monitored and reversed with the correct use of the ESMMP prepared.

REFERENCES

1. GOK (2018), Government of Kenya. County Government of Taita Taveta, County Integrated Development Plan 2018 2022.
2. Goodland, JR., Mercier and Shimwayi M (EdS) 1995: Environmental Assessment in Africa. A World Bank commitment. Nairobi, Kenya.
3. Government of Kenya (2012): The Land Registration Act, Government Printer, Nairobi.
4. Government of Kenya (2012): The National Land Commission Act, Government Printer,
5. Government of Kenya (2013): The Wildlife Conservation and Management Act, 2013. Government Printer, Nairobi, Kenya.
6. Greme E. Batley and William A. Maher, 2001: The Development and Application of ANZECC and ARMCANZ Sediment Quality Guidelines. Australian Journal of Ecotoxicology Vol.7 pp 81-92, 2001. (www.acmer.uq.edu.au/publications)
7. IUCN 2011. IUCN Red List of Threatened Species. Version 2011.1. <www.iucnredlist.org>. Downloaded on 03 September 2011.
8. Janzen, D.H. 1988. Management of habitat fragments in tropical dry forests. Annals Missouri Botanical Garden 75: 105-106.
9. Kenya gazette supplement Acts public health act (cap. 242) government printer, Nairobi.
10. Kenya gazette supplement number 68, Environmental Management and Coordination (Water Quality) Regulations, 2006, Government Printer, Nairobi.
11. Kenya gazette supplement number 68, Environmental Management and Coordination (Waste Management) Regulations, 2006, Government Printer, Nairobi.
12. Kenya gazette supplement number 68, Environmental Management and Coordination (noise and excessive vibration pollution) (control), Regulations, 2009, Government Printer, Nairobi.
13. KNBS, G. (2019). Economic survey 2019. Kenya national bureau of statistics.
14. Law, K. (ed.) (2010) *CONST2010*. Available at: http://kenyalaw.org/lex/actview.xql?actid=Const2010 (Accessed: 29 February 2024).
15. Noise prevention and control rules 2005, legal noise no. 24, government printers, Nairobi.
16. PCC, "Climate Change 2014 Synthesis Report Summary Chapter for Policymakers", (2014).
17. The Occupational Safety and Health Act, 2007, Government Printer, Nairobi.
18. US Environmental Protection Agency, "The Effect of Climate Change on Water Resources and Programs", (no date).

ANNEXES

Annex 1:LEAD EXPERT LICENSE

FORM 5 (r. 14(4))

Application Reference No: 733
Registration No: 1283
FOR OFFICIAL USE

THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT

CERTIFICATE OF REGISTRATION AS AN ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT EXPERT

This is to certify Ms. **MR. CHARLES L. MUYEMBE**
of **P. O. BOX 18823 - 00100, NAIROBI** (Address)
has been registered as an Environmental Impact Assessment Expert in accordance with the provisions of the Environment Management and Coordination Act and is authorized to practice in the capacity of a Lead Expert/Associate Expert/Firm of Experts (Type) **LEAD EXPERT**

Dated this **27TH** day **MARCH** of 20 **07**

Signature

(Seal)

Director General
The National Environmental Management Authority

GPK (L)

Tel: +254 20 6005522/3/7, 6001945
Wireless: +254 20 210370
Mobile: 0724 253 398, 0733 600 035
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Popo Road, Off Mombasa Road
P.O Box 67839-00200
Nairobi, Kenya
Website: www.nema.go.ke

NEMA/EIA/EL/27533 2024-05-23

Charles Muyembe

P.O. BOX 1784 - 00606 NAIROBI.

RE: ACKNOWLEDGEMENT OF EXPERTS LICENSE APPLICATION.

The National Environment Management Authority (NEMA) acknowledge receipt of your application for license as **Lead Expert** Environmental (Impact Assessment/ Audit) expert.

The application reference is **NEMA/EIA/EL/27533**. The Authority will review and communicate the record of decision in due course through the email address provided in the online system.

Annastacia Vyalu

HEAD OF EXPERT SECTION

Annex 2:QUESTIONNAIRES

PUBLIC CONSULTATION AND PARTICIPATION QUESTIONNAIRE

Charles and Barker Ltd on behalf of the proponent, Second Kenya Informal Settlement Improvement Programme (KISIP 2), is undertaking public consultation on the proposed projects. KISIP plans to undertake settlements improvement projects at Upper Kariokor and Aseko-Mlekenyi settlements, in Voi, Taita Taveta County. The Projects includes upgrading of marram roads, constructions of storm water drainage system and installation of high mast lights. Kindly spear time to respond to this questionnaire as part of due diligence for Environmental and Social Impact Assessment for these projects. The information provided shall only be used to prepare the said report for submission to NEMA for project Licensing.

Settlement.....

Part one: Personal Details (Provide the personal details for NEMA authentication)

a. Name of the Respondent. ESTER MUMBI MUKITHI
b. Phone Number. 0726 149586 c. ID Number. 23252698
d. Gender Male ☐ Female ☑ e. Occupation. BUSINESS LADY
e. Highest level of Education

None ☐ Primary ☐ Secondary ☐ Tertiary ☐ University ☑

Part two: General Survey

1. Do you have any concerns arising from the proposed projects (road, drainage and high mast lights) construction and operation activities?

Yes ☐ No ☑

a. If yes, state the concerns

.....

.....

2. Will the project have positive or negative impacts?

Only positive impacts ☐ Only negative impacts ☑ Both positive and negative impacts ☐

3. What the positive impacts?

Improvement of infrastructure making all areas accessable

4. What are the negative impacts?

Encroachment of settlements Lahire roads will pass

5. In your opinion, how can the negative impacts mentioned be mitigated?

Compensation

6. What is your preferred mode of transport in the area?

Walking ☐ Motorbike ☑ Vehicle ☐ Donkey ☐ Other (specify).....

7. Do you feel happy with the state of roads, storm water drainage and security lights in the area?

Yes ☐ No ☑

If no,

a. What are the main concerns with roads?

Inaccessaby of roads during rainy seas

b. How can it be addressed?

Tarmacking roads

c. What are the main concerns with storm water drainages?

Blocked draindge system.

d. How can it be addressed?

Unblocked

e. What are the concerns with the security lighting?

Very few street lights. Street lights

f. How can it be addressed?

Increasing the numbers of

8. Which road type would you prefer? Tarmac ☑ Marram ☐ Gravel ☐ Cabro

9. Kindly list the types of solid wastes produces in your household/facility/office

Left overs of foods, diapers.

10. How do you dispose off the said wastes?

Collected by municipality ☐ Disposed to predefined landfill ☑ Wild disposal areas

Disposed irregularly ☐ Burning ☐ Other (specify).....

11. What type of waste water system do you have in your household/facility/office?

Common sewerage system ☐ Septic tank ☑ Discharge directly to the neighborhoods ☐

Other (specify).....

12. What type of sanitation facility do you have in your household/facility/office?

Flush toilet ☐ Pour flush toilet ☑ Pit latrine ☐ other (specify).....

13. How do you access water?

TAVEVO Piped ☑ Borehole ☐ Streams ☐ Others (specify).....

14. What are the challenges faced concerning water supply?

High tariffs and bills, Inadequate water supply days'

15. In your opinion, in the area safe at nights? Yes ☑ No ☐

a. If no, what should be done to enhance security?

.....

16. Do you think the project will impact the culture heritage of the local population?

Yes ☐ No ☑

a. If yes, state the impacts

.....

17. What are your expectations before, during and after the project implementation?

- Transparency and accounting for all views
- locals to benefit from jobs and tenders
- General improvement of living standards'

18. Do you support the projects implementation? Yes ☑ No ☐

Thank You!

Date 10/02/2024 Signature .....

Annex 3:CHECKLIST

Environment and Social Management Framework (ESMF) screening check list

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
Brief Project Description: The proposed development in Upper Kariokor Settlement, Voi Town, involves a comprehensive upgrade of an existing 1.26KM road to bitumen standards, the establishment of a robust stormwater drainage system, and the installation of one high-mast light. The primary objectives are to enhance transportation infrastructure, mitigate potential drainage issues, and improve overall visibility and safety through strategically positioned high-mast lighting. The project, spanning 2.5 hectares, aligns with urban development goals, addressing key aspects of road infrastructure, environmental management, and public safety in the targeted area.		
A: Triggers to EMCA		
1. Does the project fall under the second schedule of EMCA Cap. 387	Yes	Yes, The projects are listed as high and medium risk projects in Legal Notice 31&32
B. Triggers to World Bank Safeguard Policies		
2. Does the project trigger one or more of the World Bank Safeguard policies	Yes, falls under Category B of World Bank OP	Yes
C. GoK Policies and Laws applicable		
3. Does the project fall under/trigger any other GoK Policies and Laws?	Yes, it triggers a number of both national Government Acts and Policies and county/local government act like Constitution of Kenya 2010, Labor Relation Act of 2012, county government act among others	Yes
D. Project Location		
4. Is the proposed site a protected or reserved site (Provide proximity in kms) • Biosphere Reserve • National park • Wildlife / Bird Sanctuary • Wetland • Important Bird Areas • Coastal area with corals • Mangrove areas (or Estuary with, mangroves) • Natural lakes • Habitat of migratory birds (outside protected areas) • Migratory Route of Wild Animals Birds • Area with threatened/ rare/endangered fauna (outside protected areas) • Area with threatened/rare/ endangered flora (outside protected areas) • Reserved/Protected Forest • Zoological Park /Botanical Garden	 No Yes, Approx 10.1km away No No No No No No No No No Mbololo Hill/forest, 0.7km No	The project is likely not to pause a challenge to the protected areas

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
5. Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project?	Yes, Tsavo East National Park	The impact may be very minimal due the distance, Approximately 10.1km
6. Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses, coastal zone, mountains, mangroves, forests or woodlands, migratory routes, which could be affected by the project?	Yes, Mbololo Hill/forest	According the elevation, the hill/forest is on the opposite direction, hence very minimal impact would be expected
7. Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	Yes, the public facilities like Moi County Referral Hospital, KMTC college, among others	Yes
8. Is the project in a location where it is likely to be highly visible to many people?	Yes, the projects are within the settlements	Yes
9. Are there any areas or features of historic or cultural importance on or around the location which could be affected by the project?	No	No
10. Is the project located in a previously undeveloped area where there will be loss of greenfield land?	No	No
11. Are there existing land uses on or around the location e.g. homes, gardens, private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining, or quarrying which could be affected by the project?	Yes, there are homes, private property, commerce, recreation, public open space, community facilities likely to be affected	Yes
12. Are there any plans for future land uses on or around the location which could be affected by the project?	No	No
13. Are there any areas on or around the location which are densely populated or built up, which could be affected by the	Yes, the project is located within the settlement,	Yes

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
project?		
14. Are there any areas on or around the locations which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities which could be affected by the project?	Yes, the projects will be adjacent to primary schools, and piped water ways	Yes
15. Are there areas on or around the location which are subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No	No
16. Is the site already degraded (low groundwater, poor soil quality)?	No	No
17. Are there steep slopes in the proximity of the investment site?	Yes, the site is located next to Mbololo hill, slopes towards Voi river.	Yes
18. Do people live on the proposed site?	Yes, the site is under settlement, and business premises	Yes
19. Do indigenous peoples live on or near the site?	No	No, various communities coming all over the country, however, majority area from Taita community, inhabit the area.
20. Is the site vulnerable to natural hazards (in floodplain, near volcano, on seismic fault, near coastline in hurricane zone)?	No	No
21. Are there land title conflicts?	No	No
22. Are there known archaeological, historical or other cultural property? Are any of these world heritage/ UNESCO designated etc	No	No
E. Construction Impacts		
23. Will construction, operation or decommissioning of the project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)?	Yes, road and drainage construction will cause changes to the topography and land use.	Yes
24. Will the construction or operation of the	Yes, 3 projects will use natural resources such	Yes

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
project use natural resources such as land, water, materials or energy, especially any resources which are non- renewable or in short supply?	as land, water, materials or energy, during construction and operation phases	
25. Will the project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	Yes, the construction, operation, or decommissioning phases of the proposed development involve the use, storage, transport, handling, or production of substances or materials that could be harmful to human health.	Yes, Activities such as handling construction materials, potential exposure to pollutants, and operational processes may pose risks to human health.
26. Will the project produce solid wastes during construction or operation or decommissioning?	Yes, most of the construction wastes will be solid waste ranging from sand, plastic wastes, gravels among others	Yes
27. Will the project release pollutants or any other hazardous, toxic or noxious substances to the air?	Yes, air pollutants will be produced inform of dust particles.	Yes
28. Will the project cause noise and vibration o release of light, heat energy or electromagnetic energy?	Yes, project phases may cause noise, vibration, or the release of light.	Yes
29. Will the project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, ground water, coastal waters or the sea?	Yes, Contamination of land or water can have severe environmental consequences. Stringent measures are required to prevent and mitigate contamination	Yes
30. Will there be any risks of accidents during the construction or operation of the project which could affect human health and the environment?	Yes, there are risks of OHS risks,	Yes
31. Will the project result into social changes, for example, in demography, traditional lifestyles, employment?	Yes, there will be possible demographic and employment changes in the area	Yes
F. Water Resource Impacts		
32. Could the investment result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction?	Yes, the proposed drainage system construction will leading to paving surfaces	Yes
33. Could it affect groundwater quality?	No	No

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
34. Could it affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams)?	Yes, the storm water discharge and solid wastes may reach Voi River	Yes
35. Will it affect water quantity in nearby water bodies (lake, river, stream)?	No	No
36. Are there nearby potable water sources that need to be protected?	Yes, water pipes and tanks available along the project area	Yes
G. Drainage Impacts		
37. Will the investment in storm water drainage affect existing drainage patterns?	Yes, positively by properly directing the storm water	Yes
38. Will it cause standing water, which could cause public health risks?	No, the elevation allows for downward flow of water	No
39. Will erosion result in sediment discharge to nearby water bodies?	Yes, the erosion is likely to end in the nearby, river, Voi River.	, Yes, due the elevation of the project, sloping to the river.
40. Will surface drainage patterns be affected in borrow pits and quarries?	Yes, there are likely to have stagnant water in pits and quarries	Yes, due to the removal of top soil creating depression.
41. Will infiltration patterns be affected?	Yes, due to compaction and digging of the surface soil	Yes, it can either reduce and lead to excess
H. Ecosystem Impacts		
42. Could the investment affect natural habitats or areas of high ecological value?	No	No
43. Could it affect natural characteristics of adjacent or nearby sites?	No	No
44. Could it affect wildlife or natural vegetation?	No	No
I. Socio-Economic Impact		
45. Will the project entail resettlement of population?	No	No
46. Will the project affect People's property or livelihoods/income?	Yes, Some few properties along the road corridor will be affected	Yes, ARAP needs to be executed with a lot of transparency
47. Will the project affect indigenous peoples?	No	No, there are no, known indigenous group around this area
48. Will it limit access to natural resources to	No	No

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
local populations?		
49. Will it have an impact on land use?	Yes, the development will attract different players to the area	Yes, close monitoring should done to ensure land use comply with the town development plan
50. Will it induce further encroachment of nearby areas?	No	No
51. Will it cause any health impacts?	No	No
52. Will it disturb nearby communities during construction?	Yes, noise and air pollution is likely to disturb the community	Yes, noise and dust will be produced during construction
53. Could cultural resources be affected?	No	No
54. Could it affect nearby properties	No	No
J. Operation Impacts		
55. Is the project susceptible to earthquakes, subsidence, landslides, erosion, flooding and extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	Yes, susceptible to erosion, the area is a steep slope from Mbololo hill.	Yes, with proper storm water drainage system, the impact will be greatly reduced.
56. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activitiesin the locality?	Yes, the projects are likely to spar further development in the area, hence close monitoring will be necessary.	Yes, the area can be prone to uncontrolled development.
K. Displacement Impacts		
57. Acquisition of private/community land?	No	No
58. Alienation of any type of government land including that owned by urbanlocal body?	No	No
59. Clearance of encroachment from government/ urban local body land?	No	No
60. Clearance of squatting from Government/Urban local body?	No	No

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
61. Number of structures, both authorized and/or unauthorized to be acquired/cleared?	None	No
62. Number of household to be displaced?	None	No
63. Details of village common properties to be alienated, Pasture land (acres) cremation /burial groundand others specify?	Yes, electricity power lines and water pipes will be affected	Yes, these can be realigned with demarcated road
64. Describe existing land uses on and around the project area (e.g. Community facilities, agriculture, tourism, private property)?	Yes, the land is mainly private property characterized by semi-permanent and permanent residential houses, there also public facilities like hospital and training institutions.	Yes
65. Will the project result in construction of workers or other people moving into or having access to the area (for a long period and in large numbers compared to permanent residents)?	No, Most of the project workers are likely to be sourced from the settlement.	No
66. Are financial/in kind compensation measures expected to be needed?	Not applicable	No
L. Loss of Assets, Crops, fruit, household infrastructure and livelihood		
67. Will the project result in the permanent or temporary loss of Crops?	No, there are no crops in the area	No
68. Fruit trees/coconut palms? Specify with numbers	No	No
69. Household assets/infrastructure? Specify with numbers	None	No
70. Loss of agriculture land? specify with numbers	No	No
M. Public and Occupational health and safety, welfare , employment and gender		
71. Is the project likely to provide local employment opportunities, including employment opportunities for women?	Yes, the project is likely to benefit both gender including the vulnerable groups	Yes
72. Is the project being planned with sufficient attention to local poverty alleviation objectives?	Yes, the project has aimed at recruiting most of the locals into the opportunities available	Yes, sensitization is being done through the local groups to allow them take advantage of the opportunities

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
73. Is the project being designed with sufficient local participation of women in the planning design and implementation process?	Yes, Women have been part of the project from technical team to the local committees	Yes, more sensitization continues
74. Will the project affect/lead to traffic and Pedestrian Safety?	Yes, it will affect and also raise safety concerns	Yes, proper measures will be suggested
75. Will the project interfere with the normal health and safety of the worker/employee/public?	Yes, most likely	Yes, Proper OHS measures will be suggested.
76. Will the project introduce new practices and habits?	Maybe, it will involve varied personnel's hence possibility of introduction of new practices and habits	Yes, continuous education will be implemented
77. Will the project lead to child delinquency (school drop-outs, child abuse, child labour, etc.?	No, not expected	Continuous education will be implemented
78. Will the project lead to gender disparity?	No, not expected, as inclusivity is key in the implementation	Continuous education will be implemented
79. Will the project lead to social evils (drug abuse, excessive alcohol consumption, crime, etc.)?	No, not expected, close monitoring will be done in collaboration with mandated bodies	Continuous education will be implemented
N. Historical, Archaeological, or cultural Heritage sites		
80. Based on available sources, consultation with local Authorities, local knowledge and/ or observation could the project alter?	No	No
81. Historical heritage site(s) or require excavation near the same?	No	No
82. Archaeological heritage site(s) or require excavation near the same?	No	No
83. Cultural heritage site(s) or require excavation near the same	No	No
84. Graves or sacred locations or require excavation near the same?	No	No
O. Result/Outcome of Environmental/ Social and Resettlement Screening Exercise		
No Environment Impact Assessment Required		
Environment Impact Assessment Required	Yes, Yes. The project meets the EMCA	

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
	schedule two projects and World Bank OP threshold for ESIA	
RAP category required (RAP/ARAP)	No ARAP is required	
Any special conditions		
P: Authorization		
Screening undertaken by: Charity Gathuthi Designation: Sociologist	Signature: Date: 05/03/2024	
Approved by: Charles Muyembe Designation: Lead ESIA Expert	Signature: Date: 05/03/2024	
PMU Confirmation by: …….. Designation.....	Signature..... Date.....	
Summary of features of project and its location indicating the need for EIA: The proposed development in Upper Kariokor Settlement, Voi Town, involves a comprehensive upgrade of an existing 1.26KM road to bitumen standards, the establishment of a robust storm water drainage system, and the installation of one high-mast light. The project, spanning 2.5 hectares, aligns with urban development goals, addressing key aspects of road infrastructure, environmental management, and public safety in the targeted area. Therefore, it is recommended that, the project **proceed** to the next phase to develop a **Comprehensive project report** to delve deeper into the project's details and refine mitigation strategies.		

Resettlement Policy Framework (RPF) Screening Checklist

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
Brief Project Description The proposed development in Upper Kariokor Settlement, Voi Town, involves a comprehensive upgrade of an existing 1.26KM road to bitumen standards, the establishment of a robust storm water drainage system, and the installation of one high-mast light. The primary objectives are to enhance transportation infrastructure, mitigate potential drainage issues, and improve overall visibility and safety through strategically positioned high-mast lighting. The project, spanning 2.5 hectares, aligns with urban development goals, addressing key aspects of road infrastructure, environmental management, and public safety in the targeted area.		
A. Triggers to WB Safeguard Policies		
1. Does the project trigger one or more of the WB Safeguard policies? Op 1.12	Yes, Falls in Category B of World Bank OP	Yes
B. GoK Policies and Laws applicable		
2. Does the project fall under/trigger any GoK Policies and Laws?	Yes, it triggers some Government Acts and Policies like Constitution of Kenya 2012, Labor Relation Act of 2012 among others	Yes
C. Project Location		
3. Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project?	No	No
4. Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	Yes, the public facilities like Moi County Referral Hospital, KMTC college, among others	Yes
5. Are there any areas or features of historic or cultural importance on or around the location which could be affected by the project?	No	No
6. Are there existing land uses on or around the location e.g. homes, gardens, private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining, or quarrying which could be affected by the project?	Yes, there are homes, private property, commerce, and community facilities.	Yes
7. Are there any areas on or around the location which are densely populated or built up, which could be affected by the project?	Yes, the whole are is populated with residential places.	Yes, some will be directly affected while other indirectly.
8. Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities which could be affected by the project?	Yes, there are sensitive land uses like the public facilities like Moi County Referral Hospital, primary schools among others	Yes
9. Do people live on the proposed site?	Yes	Yes
10. Do indigenous peoples live on or near the site?	No	No
11. Are there known archaeological, historical or	No	No

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
other cultural property? Are any of these world heritage/ UNESCO designated etc.		
D. Socio-Economic Impact		
12. Will the project entail resettlement of population?	No	No
13. Will the project affect People's property or livelihoods/income?	No	No
14. Will the project affect indigenous peoples?	No	No, there are no, known indigenous group around this area. The area is a cosmopolitan area.
15. Will it limit access to natural resources to local populations?	Yes, it may limit water and energy access for the residents	Yes
16. Will it have an impact on land use?	Yes	Yes
17. Will it induce further encroachment of nearby areas?	No	No
18. Could cultural resources be affected?	No	No
19. Could it affect nearby properties?	No	No
E. Displacement Impacts		
Will project include?		
20. Acquisition of private/community land?	No	No
21. Alienation of any type of government land including that owned by urban local body/community?	No	No
22. Clearance of encroachment from government/urban local body land?	No	No
23. Clearance of squatting from Government/Urban local body?	No	No
24. Number of structures, both authorized and/or unauthorized to be acquired/cleared?	No	No
25. Number of household to be displaced?	No	No
26. Details of village common properties to be alienated, Pasture land (acres) cremation /burial ground and others specify?	Yes, electricity power lines and water pipes will be affected	Yes, these can be realigned with demarcated road

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
27. Describe existing land uses on and around the project area (e.g. Community facilities, agriculture, tourism, private property)?	Yes, the land is mainly private property characterized by semi-permanent residential, there also public facilities like hospital and training institutions.	Yes
28. Are financial/in kind compensation measures expected to be needed?	Not applicable	No
F. Loss of Assets, Crops, fruit, household infrastructure and livelihood		
Will the project result in the permanent or temporary loss of		
29. Crops?	No, there are no crops in the area	No
30. Fruit trees/coconut palms? Specify with numbers	No	No
31. Household assets/infrastructure? Specify with numbers	None	No
32. Loss of agriculture land? specify with numbers	No	No
G. Welfare , employment and gender		
33. Is the project likely to provide local employment opportunities, including employment opportunities for women?	Yes, the project is likely to benefit both gender including the vulnerable groups	Yes
34. Is the project being planned with sufficient attention to local poverty alleviation objectives?	Yes, the project has aimed at recruiting most of the locals into the opportunities available	Yes, sensitization is being done through the local groups to allow them take advantage of the opportunities
35. Is the project being designed with sufficient local participation of women in the planning design and implementation process?	Yes, Women have been part of the project from technical team to the local committees	Yes, more sensitization continues
H. Historical, Archaeological, or cultural Heritage sites		
Based on available sources, consultation with local Authorities, local knowledge and/ or observation could the project alter?	No	No
36. Historical heritage site(s) or require excavation near the same?	No	No
37. Archaeological heritage site(s) or require excavation near the same?	No	No

Questions to be considered	Yes/No. Briefly Describe	Is this likely to result in a significant effect? Yes/No/? -why
38. Cultural heritage site(s) or require excavation near the same	No	No
39. Graves or sacred locations or require excavation near the same?	No	No
I. Result/Outcome of Environmental/ Social and Resettlement Screening Exercise		
RAP category required (RAP/ARAP)	No ARAP is required	
Any special conditions	None	
P: Authorization		
P: Authorization		
Screening undertaken by: **Charity Gathuthi** Designation: Sociologist	Signature: Date: 05/03/2024	
Approved by: Charles Muyembe Designation: Lead ESIA Expert	Signature: Date: 05/03/2024	
PMU Confirmation by:…….. Designation.....	Signature..... Date.....	
Summary of features of project and its location indicating the need for RAP The proposed development encompasses a comprehensive upgrade of existing 1.26KM road to bitumen standards, the establishment of storm water drainage system, and the installation of four high-mast lights. The project will affect public facilities like electricity power lines and water pipelines, nearby businesses, and institutions. Therefore, the project will not require **ARAP/RAP**		

Annex 4:MINUTES

COMMUNITY ENGAGEMENT MEETING FOR KARIOKOR SETTLEMENT HELD ON 29TH NOVEMBER 2023 AT KARIOKOR MUNICIPAL

MEETING AGENDA

1. Introduction
2. Presentation by the client
3. Presentation by the consultant
4. Issues and concerns from Kariokor settlement members
5. AOB

ITEM	DESCRIPTION	ACTION
1.0	**Introduction** The meeting started at 1058hrs with a word of prayer. The chief thanked all the members for attending the meeting and asked them to introduce themselves. She then invited the consultant's team for KISIP 2 Project (Kenya Informal Settlement Improvement Project) from East African Engineering Consultants to introduce themselves	Information
2.0	**Presentation by the client** The Taita Taveta County KISIP Environmentalist stated that KISIP 2 Project was funded by the World Bank and the Government of Kenya. The main aim of the KISIP 2 project was to improve the living conditions of the communities within the settlements. He further stated that Aseko/Mlekenyi and upper Kariokor were the two settlements to benefit from KISIP 2 Project in Voi. Settlement members of upper Kariokor chose one road with drainage, water and one flood light as their priority projects. The project will come with both positive and negative impact. Some of the positive impacts included improved security due to the flood lights. Good roads will lead to improved accessibility hence quick response to distress calls, reduced traffic congestion and easy transportation of goods. The project is also expected to create job opportunities to the settlement members. Some of the expected negative impacts included dust generation during construction that can lead to respiratory tract infections, displacement of people along the road reserves, noise pollution from	

	vibration of the construction heavy machinery.	
3.0	**Presentation by the Consultant** The consultant's Sociologist stated that the major function of the GRC (Grievance Redress Committee) and SEC (Settlement Executive Committee) that were selected by the community was to receive and offer resolutions to the community grievances. The settlement members were urged to make use of the SEC and GRC when there will be grievances. During construction , the consultant's sociologist will work closely with the SEC and GRC to ensure that community members are given priority when sourcing for labour There will be regular sprinkling of water 2-3 times a day to reduce dust generated during construction. Furthermore, construction work will be conducted during the day to minimise noise pollution. Lastly, trainings will be conducted to construction workers and the general public on HIV/AIDS and road safety.	
4.0	**Issues and concerns from Kariokor Settlement members** During the meeting, the community members raised the following issues and concerns; 1. One of the community members suggested that nyumba kumi initiative and the police should be engaged to ensure that the flood lights are not vandalized 2. The community requested that demarcation to be done to determine extent of encroachment. KISIP Environmentalist assured the community that demarcations will be done 3. The community requested for fairness during recruitment process and that the disabled to be also given employment opportunities. The consultant's sociologist stated that the community will be given priority when sourcing for labour in addition to that the vulnerable groups will also be included in employment 4. The community requested that the road should have bumps and walkways in areas next to learning institutions. KISIP Environmentalist stated that bumps and walkway are included in the road design 5. The community requested that training on road safety should	

	be offered to the settlement members. Consultant's sociologist stated that trainings on road safety and HIV/AIDS will be conducted when construction work commence. 6. Community members requested that they be constructed a receptacle if there will be extra funds. KISIP Environmentalist stated that the request was noted.	
6.0	**AOB** There being no any other business ,the meeting ended at 1230hrs with a word of prayer.	

 KISIP Social safeguard team addressing the meeting	 SEC addressing the meeting
 Chief addressing the meeting	 Question and answer session with the community

Settlement Executive Committee Representative:

Name: JEMIMAH MWAMBA Signature: [signature] Date: 8/12/2023

Taita Taveta County KISIP's Representative:

Name: RONALD MWAKAZI Signature: [signature] Date: 8/12/2023

Consultant's Representative:

Name: Immaculate Juma Signature: [signature] Date: 8-12-2023

SEC AND GRC MEETING FOR VOI SETTLEMENTS HELD ON 28TH NOVEMBER 2023 AT CDF OFFICE

MEETING AGENDA

1. Introduction
2. Presentation by the client
3. Presentation by the consultant
4. Issues and concerns from the SEC and GRC
5. Field Visit
6. AOB

ITEM	DESCRIPTION	ACTION
1.0	**Introduction** The meeting started at 0958hrs with a word of prayer. The ward administrator thanked all the members for attending the meeting and asked them to introduce themselves. She then invited the consultant's team for KISIP 2 Project (Kenya Informal Settlement Improvement Project) from East African Engineering Consultants to introduce themselves	Information
2.0	**Presentation by the client** The Taita Taveta County KISIP Environmentalist stated that KISIP 2 Project was funded by the World Bank and the Government of Kenya. The main aim of the KISIP 2 project was to improve the living conditions of the communities within the settlements. He further stated that Aseko/Mlekenyi and upper Kariokor were the two settlements to benefit from KISIP 2 Project. Settlement members of upper Kariokor chose one road with drainage, water and one flood light as their priority projects. Aseko/Mlekenyi Settlement selected one road with drainage and four flood lights as their priority projects. The project will come with both positive and negative impact. Some of the positive impacts included improved security due to the flood lights. Good roads will lead to improved accessibility hence quick response to distress calls, reduced traffic congestion and easy transportation of goods. The project is also expected to create job opportunities to the settlement members.	

	Some of the expected negative impacts included dust generation during construction that can lead to respiratory tract infections, displacement of people along the road reserves, noise pollution from vibration of the construction heavy machinery and spread of HIV/AIDS	
3.0	**Presentation by the Consultant** The consultant's Sociologist stated that the major function of the GRC (Grievance Redress Committee) and SEC (Settlement Executive Committee) was to receive and offer resolutions to the community grievances. The grievance handling process had six steps which included receiving of the grievance, second step involves recording of the grievance in the grievance register by the Sociologist, Third step is to conduct investigation on the received complaint, fourth step is to Provide a resolution to the complainant; fifth step involves appeal by the complainant if they are not satisfied with the resolution offered. Sixth step involves monitoring of the outcome and closing out of the grievance	
4.0	**Issues and concerns from SEC and GRC** During the meeting, the community members raised the following issues and concerns; 1. The community requested to know how wide the road was. County engineer stated that the road was 8.5m wide 2. The community requested that demarcation to be done to determine extent of encroachment. County Survey department promised to conduct demarcation by mid December 2023 3. The community requested that maps showing where KISIP 2 roads will pass should be provided. County Survey department promised to avail the maps 4. The community requested for fairness during recruitment. The consultant's sociologist stated that the community will be given priority when sourcing for labour 5. The community requested that the contractor to be chosen should sub contract some of the tenders to the local contractors. The county physical planner stated that selection of contractor for KISIP 2 project will be done at county level hence local contractors should bid for the work 6. The community requested to know how the public will be informed that the contract has been advertised. The county social department stated that the community will continuously	

	be updated on the stages of the project additionally, notices will be made on government website 7. The community requested to know how dust and noise pollution will be managed during construction. The consultant's environmentalist stated that sprinkling of water will be done 2-3 times a day to manage the dust. County Engineer said that the construction method to be adopted in KISIP 2 project will not generate a lot of noise and construction work will be done during the day and not at night 8. The community requested that early notice for vacation should be provided to those who have encroached road corridor. The county social department stated that early notice for vacation will be issued 9. The community requested to know how water and power lines along the road corridor will be handled. The county engineer said that relocation of service lines will be done during construction 10. The community requested that the road should have bumps. The county engineer stated that bumps are included in the road design 11. One of the community members requested that width of Aseko road to be reduced to minimize those who will be affected. The county engineer stated that the roads to be constructed have standard size of 8.5m that should be met	
5.0	**Field Visit** The KISIP team, SEC and GRC and the consultant conducted a field visit to the two settlements and during the field visit it was noted that the road to be constructed in Kariokor had an almost clear road corridor with very few PAPS. The road to be constructed in Aseko/Mlekenyi settlement had several encroachments that included houses, water lines, Kenya power poles, trees ,stalls and fences. The areas where the flood lights were to be erected were in public land and had no RAP issues	
6.0	**AOB** The Taita Taveta County KISIP Environmentalist stated that Community Engagement meeting was going to be held on 29th November 2023 at the respective settlements. There being no any other business the meeting ended at 1300hrs with a word of prayer	

 Photo with the GRC and SEC	 Houses along Aseko road corridor
 Client addressing the meeting	 Consultant addressing the meeting

Settlement Executive Committee Representative:

Name: RAPHAEL LUSAMO Signature: Date: 8/12/2023

Taita Taveta County KISIP's Representative:

Name: RONALD MWAKAZI Signature: Date: 8-12-2023

Consultant's Representative:

Name: Immaculate Juma Signature: Date: 8-12-2023

MINUTES OF TECHNICAL CONSULTATION MEETING FOR VOI SETTLEMENTS HELD ON 27TH NOVEMBER 2023 AT DESERT ROSE HOTEL

MEETING AGENDA

1. Introduction
2. Presentation by the client
3. Departmental recommendations on the anticipated impacts of the project
4. AOB

ITEM	DESCRIPTION	ACTION
1.0	**Introduction** The meeting started at 1000hrs with a word of prayer. The Taita Taveta County KISIP Environmentalist thanked all the members for attending the meeting and asked them to introduce themselves. He then invited the consultant's team for KISIP 2 Project (Kenya Informal Settlement Improvement Project) from East African Engineering Consultants to introduce themselves	Information
2.0	**Presentation by the client** The Taita Taveta County KISIP Coordinator stated that KISIP 2 Project was funded by the World Bank and the Government of Kenya. The main aim of the KISIP 2 project was to improve the living conditions of the communities within the settlements. He further stated that Aseko/Mlekenyi and upper Kariokor were the two settlements to benefit from KISIP 2 Project. Settlement members of upper Kariokor chose one road with drainage, one flood light and water as their priority projects. Aseko/Mlekenyi Settlement selected one road with drainage and four flood lights as their priority projects. The KISIP Coordinator requested the leaders to give the consultant the needed support since the project had a tight timeline.	
3.0	**Departmental recommendations on the anticipated impacts of the project** Taita Taveta County KISIP Environmentalist said that the project would have both negative and positive impacts. He invited the different departments present in the meeting to give their view on the	

	anticipated impacts and recommendations on how to mitigate the impacts. **County Survey Department** The department stated that encroachment into the road reserve was one of the issues they anticipated .The department recommended that the community members within the road reserves should vacate. Consultant's Environmentalist and the area chief suggested that the County Survey team should do road demarcation and extent of encroachment for KISIP 2 project areas. One of the village elders also added that the process should be done urgently. **County Planning Department** The department suggested that pegging should be done for the roads, drainages and lighting facilities to determine how much space each facility will cover. The KISIP Coordinator requested the area chief to talk to the community members who had encroached road reserves to vacate to ensure that there is enough space for construction works. The consultant's Environmentalist stated that the community should look into the future when determining road size; The roads should be constructed with reference to the recommended size. **County Lands Department** The department recommended that dispute resolutions on land should be put on record and not done verbally. The department further requested that community engagement meetings should be done to the project beneficiaries. The County Social Department urged the lands department to ensure that title deeds are not issued for areas under road reserves and notice for evacuation for people on the road reserves should be issued early. Consultant's Sociologist stated that Public Participation meetings for the community members will be conducted soon **Health Department** The department recommended the following; ✓ Health and safety of construction workers should be ensured during construction ✓ Construction sites should be demarcated to avoid accidents ✓ Dust control measures such as sprinkling of water to be done to reduce respiratory diseases ✓ PPES (Personal Protective Equipment)should be provided to construction workers to ensure safety of the workers ✓ Community members should ensure that storm water drains are not clogged by waste materials **Red Cross Department** The department stated that their office was open for any emergency and they could be contacted through their hotline **0790508925**	

	Social Services Department The department suggested that information sharing should be made efficient, community members and the political class should be educated on the benefits of the project. Consultant's Sociologist stated that community engagement meetings for the settlements will be conducted soon. **Water Department** The department suggested that individual pipes along the roads to be moved away from the road to avoid being destroyed during excavation work **Ward administrator, village administrator, chief** The department recommended that the community youths to be given priority when it comes to employment opportunities, the community to be given not only casual but also technical job opportunities.Additionaly, public participation meetings should be done at community level. The consultant's sociologist stated that the community will be given priority when sourcing for labour and public participation meetings for the community will be conducted. KISIP Coordinator said that the youths should be encouraged to attend the community meetings. He also urged local contractors to bid for the work since selection of the contractors will be done by the county	
4.0	**AOB** The Taita Taveta County KISIP Environmentalist stated that Public Participation meeting for the GRC (Grievance Redress Committee) and SEC (Settlement Executive Committee) was going to be held on 28th November 2023. There being no any other business the meeting ended at 1235hrs with a word of prayer	

KISIP Environmentalist addressing the meeting

A group photo with the leaders

Chief addressing the meeting

Village elder addressing the meeting

Voi Community Member Representative:

Name: MIRIAM NGANGA Signature: [signature] Date: 08/12/23

Taita Taveta County KISIP's Representative:

Name: RONALD MWAKAZI Signature: [signature] Date: 8/12/23

Consultant's Representative:

Name: Immaculate Tumo Signature: [signature] Date: 8-12-2023

ANNEX 5: ATTENDANCE LIST