REPUBLIC OF KENYA

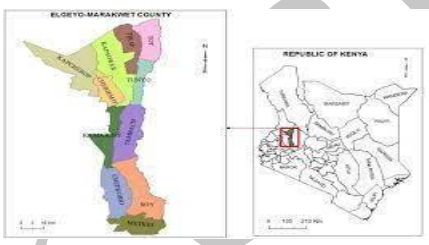
Ministry of Lands, Public Works, Housing and Urban Development.

State Department for Housing and Urban Development.

SECOND KENYA INFORMAL SETTLEMENTS IMPROVEMENT PROJECT (KISIP 2)

CONSULTANCY SERVICES FOR INFRASTRUCTURE UPGRADING PLANS, DETAILED ENGINEERING DESIGNS AND PREPARATION OF PROCUREMENT DOCUMENTS AND CONSTRUCTION SUPERVISION OF INFRASTRUCTURE IMPROVEMENT WORKS IN CHEPTONGEI INFORMAL SETTLEMENTS IN THE ELGEYO MARAKWET COUNTY.

CONTRACT NO.: KE-MOTI-298203-CS-QCBS



ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

COMPREHESIVE PROJECT REPORT FOR CHEPTONGEI SETTLEMENTS IN ELGEYO MARAKWET COUNTY

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April 2024

DOCUMENT REGISTER

Project Name:	**Consultancy Services for Infrastructure Upgrading Plans, Detailed Engineering Designs and Preparation of Procurement Documents and Construction Supervision of Infrastructure Improvement Works in Cheptongei Informal Settlements in Elgeyo Marakwet County.**
Project Number.	**KE-MOTI-298203-CS-QCBS**
Report Number	VOLUME - 01
Report Title:	Environmental and Social Impact Assessment Report (ESIA)

PREPARATION, REVIEW AND AUTHORISATION

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ISSUE REGISTER

Distribution List	Date Issued	Number of Copies
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ACRONYMS

AFD	Agence Française de Développement
AIDS	Acquired immunodeficiency virus
ADR	Alternative Dispute Resolution
AQM	Air Quality Monitor
ARAP	Abridged Resettlement Action Plan
CBD	Convention on Biological Diversity
CEC	County Executive Committee
Cfb	Temperate oceanic climate
CIDP	County Integrated Development Plan
CRICs	County Resettlement Implementation Committees
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CoG	Council of Governors
CPR	Comprehensive Project Report
E	East
E&S	Environmental and Social
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ESIA	Environment and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMMP	Environment and Social Management and Monitoring Plan
ESMP	Environment and Social Management Plan
ESS	Environmental and Social Standard
GBV	Gender Based Violence
GHG	Greenhouse gases
GoK	Government of Kenya
GRM	Grievance Redress Mechanisms
HH	Household

HIV	Human Immunodeficiency Virus
IDA	International Development Association
IFC	International Finance Corporation
ISO	International Organization for Standardization
KERRA	Kenya Rural Roads Authority
KFS	Kenya forestry Service
KIHBS	Kenya Integrated Household Budget Survey
KISIP	Kenya Informal Settlement Improvement Plan
LVNWSB	Lake Victoria North Water Services Board
N	North
NEMA	National Environmental Management Authority
NGOs	Non-Governmental Organizations
NO_2	Nitrogen Oxides
NZOWASCO	Nzoia Water and Sewerage Company
ODF	Open Defecation Free zones
PAD	Project Appraisal Documents
PAPs	Project affected persons
PCT	Project Coordinating Team
PLWD	Persons Living with Disabilities
PM_{10}	Inhalable Particulate Matter
$PM_{2.5}$	Respirable Particulate Matter
PPE	Personal Protective Equipment
PPP	Public Private Partnership
RAP	Resettlement Action Plan
RE	Resident Engineer
RIC	Resettlement Implementation Committee
RoW	Right of Way
RPF	Resettlement Policy Framework
SDG	Sustainable Development Goals

SEA	Sexual Exploitation Abuse
SEC	Social Executive Team
SEF	Stakeholder Engagement Framework
SGRC	Settlement Grievance Redress Committee
SH	Sexual Harassment
SPR	Summary Project Report
TOLs	Temporary Occupation Licenses
TSP	Total Suspended Particulates
UNFCC	United Nations Framework Convention on Climate Change
VOCs	Volatile Organic Compounds
VTMP	Vehicle & Traffic Management Plan
WASREB	Water Services Regulatory Board
WB	World Bank
WRA	Water Resource Authority
WSP	Water Services Provider

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EXECUTIVE SUMMARY

E.1 Introduction

The Government of Kenya has received Credit facility from the International Development Association (IDA) and Agence Française de Développement (AFD) towards the cost of the Second Kenya Informal Settlements Improvement Project (KISIP II) which entails Construction of Infrastructure Works in Selected Informal Settlements in the Counties of Bungoma, Elgeyo Marakwet and Trans Nzoia (9No. Settlements).

KISIP II will build on the successes and lessons learned from KISIP1, but also introduce new interventions to deepen its overall impact. It will support the interventions that have been successful under KISIP I: tenure regularization, infrastructure upgrading, and institutional strengthening. 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 employment and self-employment. KISIP II will include activities to prevent crime and violence.[1] This Project, while concentrating on informal settlements, complements existing and past urban operations in Kenya which address the urban infrastructure deficit and urban socio-economic and institutional challenges.

The project has the following four components:

Component 1: Integrated Settlement Upgrading. This component supports settlement upgrading through two main interventions classified under two sub-components:

Sub-component 1.1: Tenure regularization

Coordinates regularization of tenure for people living on uncontested public lands whose process includes;

[1] The Kenya Informal Settlements Improvement Project II Vulnerable and Marginalized Groups Framework (VMGF)

(i) Development of a local physical plan for the settlement which lays out land parcels and infrastructure (roads, drainage, walkways, etc.);

(ii) Surveying with physical placement of beacons (pegging) to demarcate the parcels as per the plan;

(iii) Preparation and issuance of letters of allotment based on the survey plan

(iv) Issuance of titles.

Sub-component 1.2: Infrastructure Upgrading

Coordinates infrastructure investment portfolio whose menu includes: roads, bicycle paths, pedestrian walkways, street and security lighting, vending platforms, solid waste collection and settlement sorting, storm water drainage, water and sanitation systems, public parks, and green spaces. It further includes investments related to prevention of crime and violence, including but not limited to community centers.

Component 2: Socio-Economic Inclusion Planning

This component supports community development plans to enhance social and economic inclusion, identifies beneficiaries who fit the eligibility criteria of government programs but are excluded and connects them appropriately, supports participatory crime and violence mapping, monitors the employment of local labor, carries out community capacity building and awareness raising for various project interventions including community-based solid waste management.

Component 3: Institutional Capacity Development for Slum Upgrading

This component supports institutional and policy development at national and county levels; develops a capacity building plan for national and county levels to implement the Strategy and to develop understanding of slum upgrading processes; also supports technical assistance, training, workshops and learning events, experience sharing and peer-learning activities with other counties, and other capacity building activities**.**

Component 4: Program Management and Coordination

This component supports activities of the National Project Coordination Team (NPCT) and the County Project Coordination Teams (CPCTs) related to national and county-level project

management and coordination, including planning, surveying, engineering, fiduciary (financial management and procurement), safeguards compliance and monitoring, monitoring and evaluation (M&E), communication and community development.

E. 2 Scope of the ESIA Assessment

The government of Kenya through its laws (Environmental Management and Coordination Act 1999) requires all projects to undergo Environmental Impact Assessment. To commence the ESIA process, Environmental and social screening must be undertaken in line with the provisions of the Environmental Management and Coordination Act CAP 387 (amended 2019) and the World Bank Operating Policies since the project is undertaken in collaboration with World Bank. The NEMA regulations requires that all new projects, programs or activities be subjected to an Environmental and Social Impact Assessment at the planning stages of the proposed undertaking to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of the Project.

E.3 Objectives of the ESIA study

The main objective of this study is to objectively assess and evaluate environmental and social impacts that may arise as a consequence of implementing the project based on the engineering design. The specific objectives are to:

i. To fulfill the legal requirements as outlined in Environmental Management and Coordination Act, EMCA 1999 (Amended 2015) and the Integrated Environmental (Impact Assessment and Audit) EIA/EA Regulations 2019;
ii. To obtain background biophysical information of the site and legal and regulatory issues associated with the Project;
iii. To assess and predict the potential environmental and social impacts during site preparation, construction and operational phases of the Project;
iv. To make suggestions of possible alterations to the proposed design, based on the assessment findings;
v. To propose mitigation measures for the potential significant adverse environmental impacts and safety risks;
vi. To prepare an Environmental and Social Management Plan (ESMP);
vii. Submit the ESIA report to NEMA for licensing.

viii. Conduct public participation/sensitization about the project.

E. 4 Project relevance and justification

The decision to improve the infrastructures within Cheptongei Informal Settlement under the scope of KISIP II was informed by the settlement's unique challenges, social and environmental considerations, need to create meaningful impacts on the livelihoods of the residents and also to contribute to the realization of national development objectives including vision 2030. The ESIA process is important as it will highlight specific challenges and guide the formulation of mitigation measures for negative impacts associated with the settlement improvement project. The construction project proposed within the informal settlement seeks to address critical infrastructural needs while adhering to the Environmental Management and Coordination (Environmental Impact Assessment and Audits) Regulations 2003 and their amendment regulations in 2019. Specifically, the project will:

i. Promote Equity and Social Justice by addressing disparities within the settlement. KISIP II's aspiration to uplift marginalized communities is consistent with broader aspirations of social justice and inclusivity.
ii. Provide avenue for Community Engagement and Involvement and enable them influence the decision-making process. Collaborating with the community has the potential of unveiling settlement-specific needs and help tailor interventions to align with community priorities.
iii. Address the challenges faced by the vulnerable groups within Cheptongei informal settlement in line with KISIP II's social objectives. Informal settlements frequently house marginalized and economically disadvantaged populations.
iv. The settlement's existing infrastructure and its potential for improvement likely shaped the decision to improve the infrastructure and promote service accessibility within the project area.
v. Improve aesthetic view of the settlement emanating from the road project

E.5 Project location

Cheptongei is in Elgeyo Marakwet County, Marakwet West Constituency, which has a cross junction whose roads connect four major areas (Eldoret, Kapsowar, Kapcherop and Mathira). Elgeyo Marakwet County covers an area of 3,032 Km^2 and is located in the Rift Valley region of Kenya. It borders the counties of West Pokot to the north, Baringo County to the east, southeast and south, Uasin Gishu to the southwest and west, and Trans Nzoia to the northwest. Its geographical coordinates are 1.0498° N, 35.4782° E and located at an altitude of 2804.22m above sea level experiencing mean temperatures of 20.47 degrees centigrade. It has a population of 454,480 as per the 2019 national population census (Elgeyo Marakwet County Integrated Development Plan, 2023-2027).

The proposed sub projects are located within Cheptongei Settlement in Cheptongei Town, Elgeyo Marakwet County located along coordinates latitude 0.8569817N and Longitude 35.4900031E with an elevation of 1169m. The settlement is mainly accessed through Iten-Kapsowar Road. The town has an estimated area of 10 Ha with a population of about 3746 (Elgeyo Marakwet County Integrated Development Plan, 2023-2027).

The settlement map is provided in the Figure 1a below.

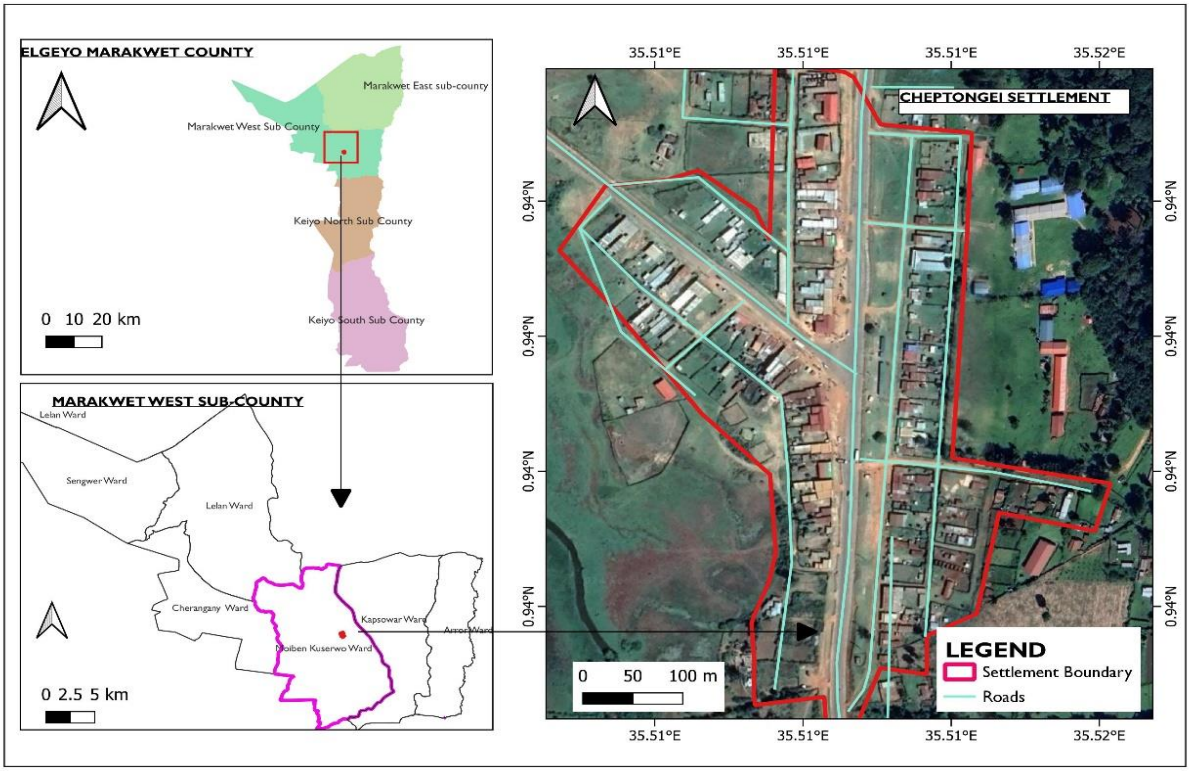


Figure 1 a . Cheptongei project areas map
(Source: Sobocon Design team)

E.6 Project Scope

The proposed project and its components comprise of construction of 1461m internal roads with 6-14m reserve width and storm drainage system running along the roads. The project will also include construction of 25 streetlights and 1 high mast flood lights to improve security in the area. The prioritized investments are provided in table 1a below.

Table 1a: Cheptongei project details

Cheptongei Settlement	
Roads /footpath	Construction of 1461m of roads I. Beelek Shop-Mamgaa-chesumet petrol station-Tarmac road-315m II. Hospital-Catholic-msafiri-324m III. Kapsiliot Sochon-Ap line teikuchu-822m
Storm water Drainage	Construction of 1461m of Storm water Drainage Network
Public lighting	Construction of 25Nr Street light and 1Nr. High mast flood light

E.7 Analysis of Project Alternatives

No project alternative

This alternative maintains the status quo. It is the most environmentally friendly alternative. However, it also means that all the socio-economic benefits that are envisioned to accrue from implementation of the project shall be foregone. The most important one being improving the living standards of the inhabitants of Cheptongei Settlements. The benefits, of this alternative is that the bio – physical condition of the project area will remain intact and any of the negative impacts anticipated from the development would not occur.

Design Alternatives

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

a. The street lights were designed to accommodate both solar energy and national grid.

b. Due to varied widths of the road alignments for the settlements, specific cross sections were proposed for each alignment fitting the necessary services within the available space

c. The topography of the settlements brings out unique surface runoff drainage challenges. There are a number of localized drainage problems where natural drainage system to the existing water ways lacks. In such cases, vertical drains were proposed to address such challenges

Design approach

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

i. Optimized the use of materials for construction;
ii. Improved geometric deficiencies;
iii. Improved the junctions;
iv. Provided access culverts and improved access roads for public convenience to major buildings;
v. Provided cross-drainage structures with adequate opening size and proper protection work;
vi. Providing roadside drainage with adequate capacity;

vii. Proper outfall connectivity of the longitudinal drains/ ditches, has been proposed;

viii. Proper outfall of culverts has been designed;

E.8 Impact Identification and Analysis

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[2]. 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 2a and Table 3a below. Similarly, impacts rating was determined based on impacts consequence and impacts likelihood as shown in Table 2a and 3a. Impacts prediction was then made during the construction and the operation phases of the proposed projects. Mitigation measures were then proposed with the hierarchy of avoidance, minimization, mitigation and offsetting the impacts.

Table 2a: 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/Neighbouring 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

[2] https://cdn.slrconsulting.com/uploads/2020-10/TEPNA_Seismic_DEIR_App4_IA_Method.pdf

Table 3a: 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

Note:

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 4a: Significance Rating Matrix

Consequence (Magnitude+ Geographic extent + Duration of the Impact)															
Likelihood (Frequency of Activity + Frequen	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120

cy of Impact)	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Note:

Rating of Impact Significance = Rating of Likelihood x Rating of Consequence

Table 5a: Negative Impacts ratings and associated colour codes

Significance rating	Value	Colour Code	Negative Impact Management Recommendation
Very high	121-150		Propose mitigation measures
High	100-120		Propose mitigation measures
Medium high	77-99		Propose mitigation measures
Low medium	51-76		Maintain current management
Low	25-50		Maintain current management
Very low	4-24		Maintain current management

E.9 Secondary data

Secondary data entailed the review of literature to obtain all relevant information pertaining to the project. The documents that were reviewed include the following:

(i) The project Environmental and Social Management Framework (ESMF)

(ii) Grievance Redress Mechanism (GRM)

(iii) Stakeholder Engagement Framework (SEF)

(iv) Vulnerable and Marginalized Groups Framework

(v) All relevant policies, regulations and guidelines

(vi) Relevant and related ESIA project and monitoring reports

(vii) World Bank OP 4.12 and 4.01.

E.10 Primary data collection

The physical evaluation of the Project area was carried out from 13th to 18th November 2023 with specific focus on the environmental and social issues.

E.11 Physical Environment

Elgeyo Marakwet County has a relatively cool climate with varying levels of rainfall across the county. This is due to the county's geomorphology and topography, which is characterized by three distinct agro-ecological zones, the Highlands to the west, the Escarpment (Hanging Valley), and the Lowlands (Valley) to the east. The altitude varies greatly within the county, from 900 m above sea level in the Valley to over 3000 m above sea level in the Highlands, resulting in significant differences in climatic conditions. The average maximum temperature in the county ranges from 25^{o}c to 28^{o}c, while the average minimum temperature ranges from 18^{o}c to 22^{o}c. The average annual rainfall ranges from 700 mm in the semi-arid Valley to 1700 mm in the Keiyo and Marakwet Highlands (Cherangany Hills). The County shows a trend of decreasing rainfall from west to east, and it is the eastern lowlands of the county that have lower and less reliable rainfall, making it more susceptible to droughts and floods. The relative humidity in the county ranges from 53% to 69%, and the wind speed is around 8 knots (15 km per hour) (Elgeyo Marakwet County Integrated Development Plan, 2023-2027).

E.12 Socio-Economic Baseline

The baseline socio-economic survey was conducted from 13th to 18th November, 2023. The data was collected using socio-economic survey tool provided in annex: VII. Survey was conducted using a sample size of 60 households picked randomly from the settlement.

E.13 Policy, Legal and Institutional Frameworks

National Policies

i. Kenya Vision 2030
ii. Sustainable Development Goals
iii. Kenya National Youth Policy 2006
iv. Gender Policy 2011
v. HIV and AIDS policy 2009

National Laws

vi. Kenyan Constitution 2010
vii. Environmental Management and Coordination Act (EMCA),2015 and subsequent regulations

viii. Water Act 2016 and subsequent regulations.
ix. County Government Act no 17 of 2012
x. Urban Cities Act of 2011
xi. Physical and Land Use Planning Act, 2019
xii. Occupational Health and Safety Act (OSHA 2007)
xiii. The Public Health Act (Cap.242)
xiv. Workplace Injuries and Benefits Act 2007

International Instruments

i. World Bank OP 4.12 on Involuntary Resettlement
ii. World Bank OP 4.11 on Physical Cultural Resources
iii. World Bank Access to Information Policy 2015
iv. World Bank OP 4.01 on Environment Assessment
v. World Bank Group Environment Health and Safety Guidelines on Water and Sanitation

KISIP Instruments

vi. Resettlement Policy Framework (RPF) revised October 2014
vii. Environmental Management and Social Framework (EMSF) revised October 2014

E.14 Public and Stakeholder Consultations

The main objective of the community and stakeholder consultation was to disseminate project information and to incorporate the views of the Project Affected Persons (PAPs) in the design of the mitigation measures and preparation of environmental and social management plans.

The specific objectives of the stakeholder and public consultation process included:

i. Introduction of the proposed project to stakeholders;
ii. Allow the stakeholders to provide comments and raise issues and concerns regarding the project;
iii. Gather and document communities' concerns about the project and the ESIA process;
iv. Obtain opinions and suggestions directly from the stakeholders on their preferred mitigation measures;

v. Assist in building and strengthening relationships with the community and stakeholders;

vi. Identify local leaders with whom further dialogue can be continued in subsequent stages of the project.

The public meeting for Cheptongei Settlement was held at Chief's office compound on 14th November, 2023 and the issues arising are presented in table 6a.

Table 6a: Issues arising from public meeting

No.	Questions/Concerns	Answers
1	The water supply to be connected from Kapsugut 6km away. This is because the water is very clean	The SEC Members to liaise with the engineers when they come on the ground. They will advise once they visit Kapsugut.
2	How many roads to be constructed?	All roads marked in the map will be put into consideration
3	Is Kisip having its own contractor for the project?	The county government will look for a contractor. Once the work commences the consultant will be on the ground to supervise the work as per the World Bank standards
4	Can multipurpose hall added to the list as one of the priorities?	The SEC members to raise the issue to the county government. They can assist in constructing the multipurpose hall.
5	Will the local youth be employed during the project implementation?	The contractor will be unveiled to the community members before commencement of works and the youth have been assured of employment especially the unskilled labor depending on the availability of the human resources in the area.
6	Need for Cooperation with the Consultant. Can the SEC Chairman be notified on when the consultant is visiting the settlement area 2 days before for planning purpose?	The residents to cooperate with the consultant so as to ensure smooth running of the project. The consultant will be notifying the Sec chairman in advance.
7	Will the SEC and GRC members trained on their roles?	The consultant will organize for SEC and GRC training. They will be communicated on when the training will be effected.

E.15 Grievance Resolution Mechanism

This grievance redress mechanism presents the structured process for addressing and resolving complaints or grievances from individuals or communities affected by the proposed projects. The mechanism is designed to provide an avenue for affected parties to voice their concerns, seek resolution, and ensure that their grievances are addressed appropriately.

Grievance Tiers

Tier 1: Settlement Grievance Redress Committee (SGRC)

The first level in addressing grievances will be at the settlement. The settlement will form a Settlement Grievance Redress Committee comprising of two members from SEC, and three other respected community members who are not PAPs. The community should elect the committee in a transparent manner and after sensitization by KISIP PCT.

Tier 2: County Resettlement Implementation Committee (CRICs)

The second level of grievance mechanism will involve the County Resettlement Implementation Committee (CRICs). The CRICs will consider grievance reports forwarded to it from the community grievance committee and make a determination. The CRIC will comprise of the County Coordinator, Environment Officer, Social/Community Officer, and Component Heads for Infrastructure, and Land tenure, Assistant Deputy County Commissioners, and Ward Administrator.

Tier 3: National PCT, (NRIC)

The third level of grievance mechanism will involve the National PCT, (NRIC) which will comprise of the National Project Coordinator, Heads of Components, Environment and Social Safeguard heads, and a designated Grievance Redress Officer who will be the Secretary. It will handle grievances referred to it by the CGRCs and monitor the performance of the whole GRM for the project.

Tier 4: Court of Law/ Alternative Dispute Resolution (ADR).

If complainants are not satisfied by the decisions of the grievance's committees, they can seek redress from a court of law or resort to Alternative Dispute Resolution (ADR).

World Bank GRS

The Grievance Redress Service (GRS) is an avenue for individuals and communities to submit complaints directly to the World Bank if they believe that a World Bank-supported project has or is likely to have adverse effects on them, their community, or their environment. The GRS enhances the World Bank's responsiveness and accountability to project-affected communities by ensuring that grievances are promptly reviewed and addressed

E.16 Environmental and Social Impact Assessment and Analysis

Whilst the KISIP II project is aimed at development and improving people's lives, it can also lead to adverse impacts to both the physical and social environment. ESIA is thus a formal process to predict the environmental consequences of the proposed developments and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive impacts.

Impacts can be classified as follows:

- Positive (beneficial) or negative (adverse);
- Direct or indirect, long-term or short-term in duration, and wide-spread or local in the extent of their effect;
- Cumulative Impacts –Impacts that build up over time.

The impacts are presented in the tables below:

Table 7a: Positive Impacts pre-construction phase

Positive Impact	Impact Category	Impact Effects
Employment Opportunities	Direct Impact	job opportunities, providing employment for local residents and contributing to economic development in the community during design study and social and environmental studies
Community Engagement	Direct Impact	The design phase often involves community engagement, consultation, and participation, fostering a sense of ownership and collaboration

Table 8a: Positive Impacts Construction phase

Positive Impact	Impact Category	Impact Effects
Employment Opportunities	Direct Impact	job opportunities, providing employment for local residents and contributing to economic development in the community during construction
Business opportunity	Direct Impact	Sourcing of construction material from the local community

Table 9a: Positive impacts operations

Positive Impact	Impact category	Impact Effects
Improved Accessibility	Direct Impact	Settlement road projects enhance the connectivity of remote or underserved areas, improving accessibility for residents and facilitating the movement of goods and services
Economic Development	Direct Impact	Construction activities and the enhanced connectivity will lead to increased economic activities as it becomes easier for businesses to transport goods, reach markets, and engage in trade, ultimately boosting local economies
Increased Property Values	Direct Impact	The proposed roads is likely to positively impact property values in the surrounding areas, attracting investment and improving the overall real estate market
Job Creation	Direct Impact	The construction and maintenance the roads create employment opportunities, supporting local communities and contributing to poverty reduction
Social Integration	Indirect Impact	Improved accessibility fosters social integration by connecting previously isolated settlements, allowing residents to interact more easily and participate in community activities
Education and Healthcare Access	Direct Impact	Settlement roads facilitate better access to education and healthcare facilities, as students, healthcare workers, and patients can travel more efficiently
Enhanced Emergency Response	Direct Impact	The roads improve access for emergency services, reducing response times and increasing the effectiveness of disaster management and healthcare delivery
Quality of Life Improvement	Direct Impact	Improved roads contribute to a better quality of life for residents, making it easier to access essential services, reducing travel times, and enhancing overall well-being
Infrastructure Development	Direct Impact	Settlement roads often pave the way for additional infrastructure development, such as water supply, sanitation, and electricity, contributing to a more developed and resilient community

Positive Impact	Impact category	Impact Effects
Community Empowerment	Direct Impact	Improved infrastructure empowers communities by providing them with the means to actively participate in economic, social, and political activities.
Reduced Isolation	Direct Impact	Settlement roads reduce the isolation of remote communities, allowing the connection with urban centers and access a broader range of services and opportunities
Positive Impact	**Impact Category**	**Impact Effects**
Employment Opportunities	Direct Impact	job opportunities, providing employment for local residents and contributing to economic development in the community in terms of maintenance and operation workers
Improved Public Health	Indirect Impact	Access to clean and safe water sources, along with proper sanitation facilities, reduces the risk of waterborne diseases and contributes to overall public health.
Disease Prevention	Direct Impact	Adequate sanitation facilities, such as latrines and sewage systems, prevent the contamination of water sources and the spread of waterborne diseases like cholera and dysentery.
Reduced Mortality Rates	Direct Impact	Access to safe water and sanitation facilities is linked to lower mortality rates, particularly among children, as it helps prevent water-related illnesses.
Enhanced Hygiene Practices	Direct Impact	Provision of handwashing facilities and hygiene education encourages better hygiene practices, leading to improved personal and community health
Increased Productivity	Direct Impact	Access to reliable water sources saves time spent on water collection, particularly for women and children, allowing for increased productivity and educational opportunities
Food Security	Direct Impact	Reliable water sources contribute to improved agricultural practices for those practicing agriculture, leading to increased food security and livelihoods for communities
Gender Empowerment	Direct Impact	Provision of water and sanitation facilities can empower women and girls by reducing the time and effort spent on water-related activities, allowing for more educational and economic opportunities
Community Resilience	Direct Impact	Water projects that focus on sustainable water management contribute to community resilience in the face of climate change and water scarcity
Reduced Water-Borne Pollution	Direct Impact	Proper sanitation facilities prevent the contamination of water sources, reducing waterborne pollution and protecting aquatic ecosystems.
Social Equity	Direct Impact	Equitable access to water and sanitation facilities promotes social inclusion and reduces disparities, fostering a sense of community well-being.
Community Gathering Spaces	Direct Impacts	Ablution blocks can serve as community gathering spaces, fostering social interaction and cohesion within the community
Improved Hygiene Practices	Direct Impacts	Provision of handwashing facilities in ablution blocks promotes good hygiene practices among the community members
Enhanced Dignity and Privacy	Direct Impacts	Adequate ablution facilities contribute to the dignity and privacy of individuals, particularly in crowded or public spaces

Positive Impact	Impact Category	Impact Effects
Community Education	Indirect Impacts	Ablution blocks can serve as platforms for hygiene and sanitation education, raising awareness about the importance of cleanliness and health
Reduction of Open Defecation	Direct Impacts	Adequate sanitation facilities, including ablution blocks, contribute to the reduction of open defecation, improving community health and sanitation
Local Economic Opportunities	Indirect Impacts	Construction and maintenance of ablution blocks can create local job opportunities, contributing to the economic well-being of the community
Emergency Preparedness	Direct Impacts	Ablution blocks can serve as essential facilities during emergencies, providing access to clean water and sanitation services in times of need
Improved Accessibility	Direct Impact	Settlement road projects enhance the connectivity of remote or underserved areas, improving accessibility for residents and facilitating the movement of goods and services
Economic Development	Direct Impact	Construction activities and the enhanced connectivity will lead to increased economic activities as it becomes easier for businesses to transport goods, reach markets, and engage in trade, ultimately boosting local economies
Increased Property Values	Direct Impact	The proposed roads is likely to positively impact property values in the surrounding areas, attracting investment and improving the overall real estate market
Job Creation	Direct Impact	The construction and maintenance the roads create employment opportunities, supporting local communities and contributing to poverty reduction
Social Integration	Indirect Impact	Improved accessibility fosters social integration by connecting previously isolated settlements, allowing residents to interact more easily and participate in community activities
Education and Healthcare Access	Direct Impact	Settlement roads facilitate better access to education and healthcare facilities, as students, healthcare workers, and patients can travel more efficiently
Enhanced Emergency Response	Direct Impact	The roads improve access for emergency services, reducing response times and increasing the effectiveness of disaster management and healthcare delivery
Quality of Life Improvement	Direct Impact	Improved roads contribute to a better quality of life for residents, making it easier to access essential services, reducing travel times, and enhancing overall well-being
Infrastructure Development	Direct Impact	Settlement roads often pave the way for additional infrastructure development, such as water supply, sanitation, and electricity, contributing to a more developed and resilient community
Community Empowerment	Direct Impact	Improved infrastructure empowers communities by providing them with the means to actively participate in economic, social, and political activities.
Reduced Isolation	Direct Impact	Settlement roads reduce the isolation of remote communities, allowing the connection with urban centers and access a broader range of services and opportunities
Positive Impact	**Impact category**	**Impact Effects**
Reduced Crime and Increased Safety	Direct Impacts	Well-lit streets and public spaces contribute to increased safety, potentially reducing criminal activity and enhancing public security

Positive Impact	Impact Category	Impact Effects
Enhanced Visibility and Reduced Accidents	Direct Impacts	Adequate lighting improves visibility, reducing the likelihood of accidents and improving overall road safety for pedestrians and motorists
Increased Sense of Community	Direct Impacts	Well-lit public spaces foster a sense of community by providing a safe and welcoming environment for residents to gather, socialize, and participate in community events
Support for Nighttime Economy	Indirect Impacts	Street lights contribute to a vibrant nighttime economy by extending business hours and supporting nighttime activities in commercial areas
Emergency Response Improvement	Direct Impacts	Adequate lighting facilitates emergency response efforts by providing clear visibility during nighttime incidents or emergencies
Improved Public Health	Direct Impacts	Well-lit streets and public spaces contribute to community well-being by promoting mental health, reducing fear of crime, and enhancing overall feelings of safety
Enhanced Aesthetics	Indirect Impacts	lighting installations contribute to the visual appeal of public spaces, making the lit areas more attractive and creating a positive ambiance
Increased Property Values	Indirect Impacts	Well-lit neighborhoods and commercial areas can contribute to increased property values, attracting investment and promoting economic growth

Table 10a: Positive impacts decommissioning phase

Positive Impact	Impact Category	Impact Effects
Employment Opportunities	Direct Impact	job opportunities, providing employment for local residents and contributing to economic development in the community during decommissioning
Business opportunity	Direct Impact	The camp sites can be converted to community social amenities such has dispensary, school or police station

E.17: Possible General Negative Impacts

The generic impacts that would cut across all the proposed projects includes and is not limited to the impacts outlined below.

Table 11A: Pre- Construction Phase General Impacts

Anticipated Negative Impact	Impact description
Displacement	The project will lead to the displacement of 2 PAPs

Table 12a: Construction Phase General Impacts

Anticipated Negative Impact	Impact description
Air Pollution from dust	Emissions to air during construction and operation have the potential to impact sensitive receptors (residents), both within the immediate vicinity and the project area of influence. Construction activities such as utility diversions, road excavation and road resurfacing works will result in dust and particulate emissions which may be exacerbated by winds and dry weather. Dust emissions have the potential for temporary significant negative effects, particularly on road users and sensitive receptors adjacent to construction sites and compounds.
Noise and vibration	Noise and vibration can be a source of disturbance at sensitive receptors. Given the urban context of the proposed project, sensitive noise and vibration receptors include buildings (residential, places of worship and educational dwellings) and road users in the immediate vicinity of the existing settlements.
Flooding of storm water due to blocked drainage channels	Flooding could occur mainly due to alternation or blockage of existing drainage channels during construction. This with the changing weather patterns could lead to flooding that may lead to loss of property and life.
Water Quality	Construction activities such as diversion of utilities, road excavation and road widening have the potential to create pathways for pollutants to enter watercourses and indirectly impact on water quality. Soil compaction during construction has the potential to increase the rate of surface water runoff.
Displacement Impacts	This could happen when people have settled along the project reserve areas or during compulsory acquisition of land for development projects. There will be no compulsory acquisition for KISIP projects.
Destruction of water pipes or disruption of water supply, sewer and power lines	Construction activities may disrupt the daily lives of community members, affecting routines and causing inconvenience
Incidence of HIV/AIDS	Migration of people from different regions with diverse moral backgrounds through various workforce may lead to behavioral influences which may increase the spread of diseases such as Human Immuno-Deficiency Virus (HIV),
Vegetation loss	Clearing the vegetation would lead to soil erosion
Soil loss and soil pollution	Construction activities will require the excavation of existing made ground and the existing roadbed. Construction activities may create pathways between contaminants from the existing made ground and the local environment and groundwater resources which has the potential to result in significant negative effects (both temporary and permanent). In addition, construction activities may result in generation and removal of materials and solid waste generation.

Solid waste generation	Solid wastes will mainly emanate from the construction activities and will include excavated soil, cement storage bags and other packaging materials used during construction, spillage of oil and grease from machines used in excavation, waste from repair and maintenance of construction equipment, part demolition waste among others
Visual impacts	Temporary structures, construction debris, and equipment may create visual eyesores during the construction phase while Dust generated from construction activities can contribute to reduced air quality, affecting the clarity of views among other impacts
Potential impact on traffic/ obstruction of temporary access	Construction of the proposed infrastructure projects has the potential to impact people's day-to-day travel activities. Temporary traffic diversions, and in some instances temporary lane or road closures, may be required to undertake construction activities. Temporary traffic diversions and road closures may also reduce traffic capacity.
Accidental spills & leakages	Accidental spills from the construction vehicles and construction materials could occur during construction. This would lead to soil, surface and subsurface water pollution
Occupational Health and Safety Risks	During construction, workers would be exposed to various health and safety risks that would require control measures be taken. Opportunities for employment will also be created/available during the construction of the projects that would require hiring policies and employ management plans.
Building materials	Sourcing the building materials could lead to resource depletion and could sourcing from far areas could also lead to high costs and high carbon footprints
River water contamination	This could occur once vegetation is cleared and the soils are exposed to erosion factors. Material piles also if not properly secured would lead to downstream contamination of existing nearby springs and rivers
Sustainability and Climate Change Impacts	The potential impacts include greenhouse gas emissions, resource depletion, air and water pollution etc.
Inadequate stakeholder Engagement.	Conflicts and delay in project due inadequate stakeholder engagement
Exclusion of disadvantaged and vulnerable groups	Project benefit may not reach the vulnerable population hence subjecting to increased poverty
Ineffective Grievance Management	Grievances may derail the project if not resolved in a timely manner

Gender-Based Violence Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH	Women and the adolescent girls may be exposed to SEAH from workers employed during the construction of the project
Child Exploitation and Abuse	Employment of children to work in the project may expose them to abuse to and injury

Table 13a: Operations Phase general Impacts

Anticipated Negative Impact	Impact description
a) Air Pollution	Emissions from vehicles and motorbikes using the roads on a daily basis will contribute to air pollution during operation phase of the project. The impact on air quality during repairs and maintenance (operation phase) is expected to occur
b) Noise Pollution	Noise emission and associated impacts during repairs and maintenance is expected to be low and will emanate from motorized equipment as well as noise from the motor vehicles used on the roads.
c) Possible vandalism and theft of accessories	Installed roads, lights infrastructure could be targeted for theft
d) In effective Grievances Management	Grievance on the use of the infrastructure and employment
e) Incidence of HIV/AIDS	Multiple sexual interactions by employees could lead to spread of HIV/Aids
f) GBV-Sexual Exploitation and Abuse (SEA) of communities by project workers and Sexual Harassment (SH) amongst employees	This could unfold when operators ask for favors from job seekers for an employment chance. This could also unfold when employees are exploited by their leadership to retain their jobs among other reasons
g) Child Exploitation and Abuse	Employment of under aged individuals during operation stages of the project
h) Exclusion of disadvantaged and vulnerable groups e.g PWDs, elderly, youth, the sick, the poor, single-women, OVC etc.	Unequal employment opportunities denied to the vulnerable persons
i) Inadequate stakeholder engagement	Numerous grievances from the public regarding ownership and operations of the projects

E. 18 Environmental Management and Monitoring Plan

Objectives of this ESMMP

This ESMMP has been developed as a tool to guide the proponent and the contractor during the project implementation since it captures the anticipated impacts and therefore acts as a preventive measure towards possible social and economic disruptions that may arise during project implementation. It provides the indicative mitigation measures, the monitoring indicators, responsibilities for mitigation and monitoring and the anticipated costs. The ESMMP summarizes the environment and social impacts identified and their proposed mitigation measures, the actions to be taken by various parties and the monitoring indicators. An indication of the implementation and monitoring timelines is also provided.

E. 19 Conclusion

Cheptongei KISIP 2 projects, identified in collaboration with the community, prioritize essential elements such as roads, drainage systems, and street lighting. Following a thorough screening, these projects have been categorized as having a medium risk level, prompting the need for an Environmental and Social Impact Assessment Study.

Considering factors like project location, design, available alternatives, regulatory compliance, and community feedback, both positive and negative impacts have been discerned. Each negative impact has accompanying recommended mitigation measures, and the implementation of these measures is anticipated to result in minimal and negligible consequences.

A pivotal aspect of these proposed projects is their location on government land, significantly reducing the risk of displacement. Two (2) Project Affected Persons (PAPs) are slated for displacement during the implementation phase, streamlining the acceptance and execution process.

While the execution of the proposed projects is anticipated to yield both positive and negative impacts, this report outlines mitigation measures based on key stakeholder opinions and community feedback gathered during engagements. Chapter Nine (9) presents a comprehensive environmental management plan aimed at further diminishing identified potential adverse impacts, demonstrating a commitment to minimizing negative consequences. The study ultimately concludes that the project will greatly benefit the community as a whole.

E.20 Recommendations

Based on the assessment and findings presented in this Environmental and Social Assessment report, the following recommendations are proposed:

i. Develop an ESMMP implementation action plan, Stakeholder Engagement plan and GRM
ii. Develop the traffic management plans that will be used during the construction phase
iii. Obtain all the required construction and operational permits before commencement
iv. Develop the Health and Safety management plans
v. The contractor should comply with the approved designs and implement ESMP developed by the consultant
vi. Include the proposed mitigations in the tender contract and tender documents so that the contractor who will be selected for the project will be bound to implement them.

CHAPTER ONE

1. PROJECT OVERVIEW

1.1. Introduction and Project Background

The Government of Kenya has received Credit facility from the International Development Association (IDA) and AFD towards the cost of the Second Kenya Informal Settlements Improvement Project (KISIP II) which entails Construction of Infrastructure Works in Selected Informal Settlements in the Counties of Bungoma, Elgeyo Marakwet and Trans Nzoia.

The Second Kenya Informal Settlements Project (KISIP II) will build on the successes and lessons learned from KISIP1, but also introduce new interventions to deepen its overall impact. It will support the interventions that have been successful under KISIP I: tenure regularization, infrastructure upgrading, and institutional strengthening. 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 employment and self-employment. KISIP II will include activities to prevent crime and violence[3].

This Project, while concentrating on informal settlements, complements existing and past urban operations in Kenya, which address the urban infrastructure deficit and urban socio-economic and institutional challenges.

1.2. KISIP II Project Overview

The project has the following four components:

Component 1: Integrated Settlement Upgrading. This component supports settlement upgrading through two main interventions classified under two sub-components:

Sub-component 1.1: Tenure regularization

[3] The Kenya Informal Settlements Improvement Project II Vulnerable and Marginalized Groups Framework (VMGF)

Coordinates regularization of tenure for people living on uncontested public lands whose process includes;

i. Development of a local physical plan for the settlement which lays out land parcels and infrastructure (roads, drainage, walkways, etc.);
ii. Surveying with physical placement of beacons (pegging) to demarcate the parcels as per the plan;
iii. Preparation and issuance of letters of allotment based on the survey plan
iv. Issuance of titles.

Sub-component 1.2: Infrastructure Upgrading

Coordinates infrastructure investment portfolio whose menu includes roads, bicycle paths, pedestrian walkways, street and security lighting, vending platforms, solid waste collection and settlement sorting, storm water drainage, water and sanitation systems, public parks, and green spaces. It further includes investments related to prevention of crime and violence, including but not limited to community centers.

Component 2: Socio-Economic Inclusion Planning

This component supports community development plans to enhance social and economic inclusion, identifies beneficiaries who fit the eligibility criteria of government programs but are excluded and connects them appropriately, supports participatory crime and violence mapping, monitors the employment of local labor, carries out community capacity building and awareness raising for various project interventions including community-based solid waste management.

Component 3: Institutional Capacity Development for Slum Upgrading

This component supports institutional and policy development at national and county levels; develops a capacity building plan for national and county levels to implement the Strategy and to develop understanding of slum upgrading processes; also supports technical assistance, training, workshops and learning events, experience sharing and peer-learning activities with other counties, and other capacity building activities**.**

Component 4: Program Management and Coordination

This component supports activities of the NPCT and the CPCTs related to national and county-level project management and coordination, including planning, surveying, engineering, fiduciary (financial management and procurement), safeguards compliance and monitoring, monitoring and evaluation (M&E), communication and community development.

1.3. Scope of the ESIA Assessment

The government of Kenya through its laws (Environmental Management and Coordination Act 1999) requires all projects to undergo Environmental Impact Assessment. To commence the ESIA process, Environmental and social screening must be undertaken in line with the provisions of the Environmental Management and Coordination Act CAP 387 (amended 2019) and the World Bank Operating Policies since the project is undertaken in collaboration with World Bank. The NEMA regulations require that all new projects, programs or activities be subjected to an Environmental and Social Impact Assessment at the planning stages of the proposed undertaking to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of the Project.

1.4. Objectives of the ESIA study

The main objective of this study is to objectively assess and evaluate environmental and social impacts that may arise because of implementing the project based on the engineering design. The specific objectives are to:

i. To fulfill the legal requirements as outlined in Environmental Management and Coordination Act, EMCA 1999 (Amended 2015) and the Integrated Environmental (Impact Assessment and Audit) EIA/EA Regulations 2019;
ii. To obtain background biophysical information of the site and legal and regulatory issues associated with the Project;
iii. To assess and predict the potential environmental and social impacts during site preparation, construction and operational phases of the Project;
iv. To make suggestions of possible alterations to the proposed design, based on the assessment findings;

v. To propose mitigation measures for the potential significant adverse environmental impacts and safety risks;
vi. To prepare an Environmental and Social Management Plan (ESMP);
vii. Submit the ESIA report to NEMA for licensing.
viii. Conduct public participation/sensitization about the project.

1.5. Project relevance and justification

The decision to improve the infrastructures within Cheptongei Informal Settlement under the scope of KISIP II was informed by the settlement's unique challenges, social and environmental considerations need to create meaningful impacts on the livelihoods of the residents and also to contribute the realization of national development objectives including vison 2030. The ESIA process is important as it will highlight specific challenges and guide the formulation of mitigation measures for negative impacts associated with the settlement improvement project. The construction project proposed within the informal settlement seeks to address critical infrastructural needs while adhering to the Environmental Management and Coordination (Environmental Impact Assessment and Audits) Regulations 2003 and their amendment regulations in 2019. Specifically, the project will:

i. Promote Equity and Social Justice by addressing disparities within the settlement. KISIP II's aspiration to uplift marginalized communities is consistent with broader aspirations of social justice and inclusivity.
ii. Provide avenue for Community Engagement and Involvement and enable them influence the decision-making process. Collaborating with the community has the potential of unveiling settlement-specific needs and help tailor interventions to align with community priorities.
iii. Address the challenges faced by the vulnerable groups within Cheptongei informal settlement in line with KISIP II's social objectives. Informal settlements frequently house marginalized and economically disadvantaged populations.
iv. The settlement's existing infrastructure and its potential for improvement likely shaped the decision to improve the infrastructure and promote service accessibility within the project area.

v. Improve aesthetic view of the settlement emanating from the road project

The main objective of the Kenya Informal Settlements Improvement Project II is to improve living conditions in the selected informal settlements in Elgeyo Marakwet. Inadequate infrastructure, insecurity sporadic access to public services, and environmental degradation are some of the aspects that KISIP II is aiming to address. The proposed projects will be of benefit to the proposed residents as follows:

a) Benefits of investments in urban roads

The benefits associated with improved roads are (a) travel time savings; (b) travel cost savings; (c) reductions in vehicle operating costs; (c) enhanced access to jobs, markets, health facilities, schools, and other services at lower cost than otherwise available (reflected in enhanced land values); and (d) promotion of economic growth in the region through enhanced trade, increased efficiency, and higher productivity. The economic rate of return for urban roads under various World Bank-supported projects in Africa ranged from 18 to 33 percent.

b) Benefits of drainage systems

Benefits include (a) reduced number of days of work lost due to flooding; (b) reduced property damage (buildings, roads, furniture, appliances, household goods); (c) increased property values; (d) reduced loss of income from businesses whose hours are curtailed and access reduced; (e) improved travel times on streets that used to flood; (f) lower maintenance costs for vehicles; and (g) reduced costs of illness associated with exposure to polluted and stagnant water. Analysis done for the Kenya Municipal Program showed that investments in a drainage system that considered only a reduced number of days lost from work generated an internal rate of return of 32 percent.

c) Benefits of investments in street lighting

Benefits of street lighting include (a) increased perception of safety, (b) reduced accidents, and (c) and increased ability to do business after dark. People interviewed for the beneficiary analysis of KISIP I noted that they felt a greater sense of security at night and were now walking along streets with lights, rather than taking motorized transport to their destinations. Some participants pointed out that accidents between vehicles and between vehicles and pedestrians had declined.

Some mentioned that business hours had expanded and that the appearance and livability of the urban center had improved.

d) Benefits of tenure security.

Benefits of tenure security include (a) increased investments in housing and businesses, (b) increased labour-force participation, and (c) improved health due to reduced stress from fear of displacement and expropriation. People interviewed for the beneficiary analysis of KISIP I noted that they felt much reduced stress and were planning to invest in their properties.

1.6. ESIA Screening

The consultant carried out environmental screening, which was informed by the Second Schedule of the Environmental Management and Coordination (Impact Assessment and Audit) Regulations, 2003 and the World Bank guidelines. As per the Schedule the issues considered by the team of experts included ecological, socio-economic, landscape use, changes, and water demand. The detailed screening checklist is presented in Annex: IV and V of this report.

1.7. Environment and Social Scoping

This process-involved identification of significant environmental and social impacts associated with the proposed construction works. Scoping was done through reviews of the secondary documents and available data supported with field evaluations. The process enabled the consultant to determine the Project potential social, environmental, biophysical and Health and Safety risks.

1.8. ESIA Project Scope

Scoping was undertaken and established that the ESIA study will include the following:

1. Baseline Environmental Assessment
    a. Air quality assessment (PM_{10}, $PM_{2.5}$, SO_2, NO_2)
    b. Environmental noise assessment
    c. Water quality assessment
2. Literature Review
3. Site visit/inspection
4. Environmental and Social Impacts identification and analysis

5. Public and Stakeholder consultations
    a. Key Stakeholders consultations
    b. Public Consultations

1.9. Environmental and Social Impact Assessment Methodology

Environmental and Social Impact Assessment (ESIA) is a comprehensive process employed to evaluate the potential environmental and social consequences of proposed projects, plans, or policies before they are implemented. The primary goal of ESIA is to identify, predict, and assess the potential impacts of these initiatives to ensure that they are undertaken in a sustainable and responsible manner. The ESIA process employed for the study included the following:

1.10. Baseline data collection

1.10.1 Primary Data Collection

Primary data collection was undertaken to determine the baseline conditions of the proposed project area and assess potential environmental and social impacts. The primary data was collected through field survey, public barazas, Key informant interviews, focus group discussions and field observations. Measurements for baseline ambient air and noise measurements, and water quality was also taken. The main data collection tools used were the field survey questionnaire, focus group guiding questions and attendance sheets.

a) Baseline air quality monitoring

Air quality monitors were employed at different locations to assess the air quality levels of inhalable respirable Particulate Matter ($PM_{2.5}$ and PM_{10}) respectively as well as for the collection of gaseous pollutants including Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2).

b) Water Quality monitoring

Water samples from surface and subsurface water sources were collected and sent to designated laboratory for analysis. ISO 1996-2(1996) was used as the best practice guidelines on the assessment of noise Guidelines.

c) Noise levels monitoring

ISO 1996-2(1996) was used as the best practice guidelines on the assessment of noise Guidelines. Spot check noise of 15 mins were conducted at each monitoring locations described where information on daily variability in noise levels, as well as an expected typical or average daily condition of the noise is provided.

1.1.2 Secondary data collection

Secondary data was also assessed to establish the existing data that would help in providing context, background, and additional insights into the environmental, social, and economic aspects of the project area. Secondary data was collected through literature reviews, review of previous reports, and use of published information from reputable websites. Some of the documents that were reviewed included the following:

KISIP Instruments

1. The project Environmental and Social Management Framework (ESMF)
2. Grievance Redress Mechanism (GRM)
3. Stakeholder Engagement Framework (SEF)
4. Vulnerable and Marginalized Groups Framework

Government guidelines and regulations

5. All relevant policies, regulations and guidelines
6. Relevant and related EIA project and monitoring reports

World Bank policies

7. World Bank's Operational Policy (OP) 4.01 on Environmental Assessment
8. World Bank's Operational Policy (OP) 4.12 on Involuntary Resettlement
9. World Bank OP 4.11 on Physical Cultural Resources
10. World Bank Access to Information Policy 2015
11. World Bank Group Environment Health and Safety Guidelines on Water and Sanitation

1.11. Stakeholder consultations

Engagement of stakeholders is crucial because it helps a project achieve transparent decision-making and overall sustainability. The key stakeholders were identified and mapped on the basis

of influence and interest on an ordinal scale of 0-5 (for either interest or influence from low (0) to high (5)

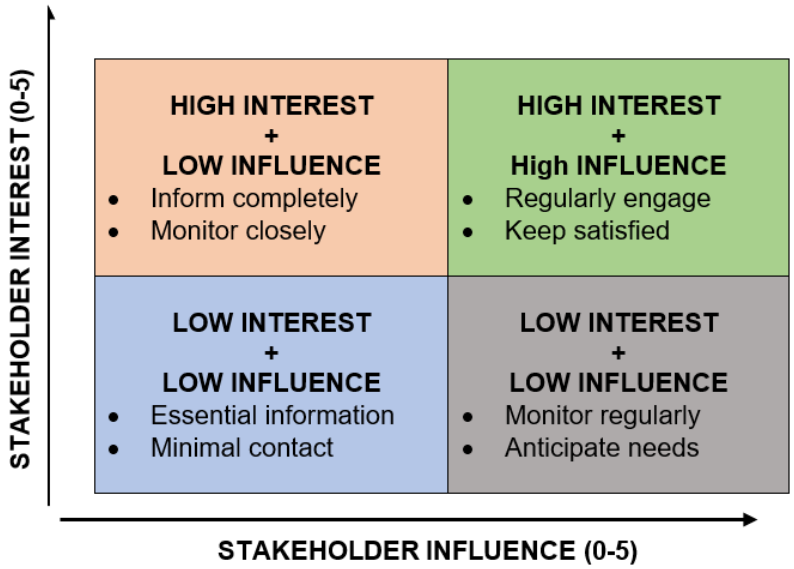


Figure 1: Stakeholder consultations

1.11.1. Key stakeholder's consultations

One on one interviews with key stakeholders within the project area were undertaken from 20th to 23rd November 2023 to obtain and document comments of the affected and or interested persons to the proposed project. The interviews were conducted using key informant interview guide. The identified and consulted key stakeholders included the following:

1. National Environmental Management Authority (NEMA)
2. Ministry of Environment and Natural Resources
3. Ministry of Lands, Housing, and Infrastructure Development (MoLHID)
4. Kenya forestry Service (KFS)
5. Ministry of Water and Sanitation
6. Settlement Committee Members (SEC)

1.1.12 Public Meetings/ Barazas

Community consultations and sensitization were undertaken to provide the project area community and key stakeholders with an opportunity to directly interact with the project proponent through the ESIA Consultants, ask questions, raise issues and concerns pertaining to the proposed projects, and contribute to the identification of project impacts, mitigation measures and project alternatives.

1.12. Socio-Economic Survey

Socio-economic survey was carried out between 11th to 18th November 2023 to identify and understand the various social groups and stakeholders potentially impacted by the project and Understanding their demographics, livelihoods, socio-cultural practices to help in assessing potential social impacts and designing appropriate mitigation measures. These socio economic data establishes a baseline which future changes and impacts can be measured. The baseline conditions include information on income levels, employment patterns, access to services (such as healthcare and education), land tenure systems, and other socio-economic indicators.

The socio-economic survey conducted for KISIP II aimed to identify both the potential positive and negative impacts of the project on local communities and individuals. This survey utilized a pre-designed Socio-economic survey tool provided in Annex VII administered by trained enumerators across all settlements.

1.13. Abbreviated Resettlement Action Plan (A-RAP)

An abbreviated Resettlement Action Plan has been prepared in compliance with the Government's National Policy on Involuntary Resettlement, World Bank's Operational Policy (OP) 4.12 on Involuntary Resettlement and the project's social management framework (SMF). Complete A-RAP report has been prepared and presented in Annex: III of this report.

1.14. Environmental and Social Impact Identification and Analysis

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[4]. 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 1 and Table 2 below. Similarly, impacts rating was determined based on impacts consequence and impacts likelihood as shown in Table 3 and 4. Impacts prediction was then made during the construction and the operation phases of the proposed projects. Mitigation measures were then proposed with the hierarchy of avoidance, minimization, mitigation and offsetting the impacts.

Table 1: 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/Neighbouring 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 2: 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

[4] https://cdn.slrconsulting.com/uploads/2020-10/TEPNA_Seismic_DEIR_App4_IA_Method.pdf

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 3: Significance Rating Matrix

	Consequence (Magnitude+ Geographic extent + Duration of the Impact)														
Likelihood (Frequency of Activity + Frequency of Impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Note:

Rating of Impact Significance = Rating of Likelihood X rating of Consequence

Table 4: Negative Impacts ratings and associated colour codes

Significance rating	**Value**	**Colour Code**	**Negative Impact Management Recommendation**
Very high	121-150		Propose mitigation measures
High	100-120		Propose mitigation measures
Medium high	77-99		Propose mitigation measures

Low medium	51-76		Maintain current management
Low	25-50		Maintain current management
Very low	4-24		Maintain current management

CHAPTER TWO

2. PROJECT DESCRIPTION AND DESIGN

2.1. General Description of the Project Environment

Cheptongei is in Elgeyo Marakwet County, Marakwet West Constituency, which has a cross junction whose roads connects four major areas (Eldoret, Kapsowar, Kapcherop and Mathira). Elgeyo Marakwet County covers an area of 3,032 Km^2 and is located in the Rift Valley region of Kenya. It borders the counties of West Pokot to the north, Baringo County to the east, southeast and south, Uasin Gishu to the southwest and west, and Trans Nzoia to the northwest. Its geographical coordinates are 1.0498° N, 35.4782° E and located at an altitude of 2804.22m above sea level experiencing mean temperatures of 20.47 degrees centigrade. It has a population of 454,480 as per the 2019 national population census (Elgeyo Marakwet County Integrated Development Plan, 2023-2027).

Elgeyo Marakwet County has a relatively cool climate with varying levels of rainfall across the county. This is due to the county's geomorphology and topography, which is characterized by three distinct agro-ecological zones, the Highlands to the west, the Escarpment (Hanging Valley), and the Lowlands (Valley) to the east. The altitude varies greatly within the county, from 900 m above sea level in the Valley to over 3000 m above sea level in the Highlands, resulting in significant differences in climatic condition. Elgeyo Marakwet County has three distinct ecological zones, the Highlands, the Escarpment and the Valley. The settlement is enveloped by a lush and diverse vegetation cover, boasting a rich array of tree species. Among these are cider, podo, Cyprus, gravellier, Nandi flame, eucalyptus, simotwo, among other unidentified trees. This verdant canopy not only enhances the aesthetic appeal of the area but also plays a crucial role in maintaining ecological balance and biodiversity. The main source of water for Cheptongei residents is River Moiben, which lies about 500m from the market. The area also has wetlands namely Kampi Zuzu and Kampi Chura. It borders Cherangany Forest, which acts as a water catchment area to the environs.

2.2. Project location

The proposed sub projects are located within Cheptongei Settlement in Cheptongei Town, Elgeyo Marakwet County located along coordinates latitude 0.8569817N and Longitude 35.4900031E with an elevation of 1169m. The settlement is mainly accessed through Iten-Kapsowar Road. The town has an estimated area of 10 Ha with a population of about 3746 people (Elgeyo Marakwet County Integrated Development Plan, 2023-2027). Figure 2 and 3 below represent the proposed project location areas.

Figure 2: Map of Elgeyo Marakwet County
Source: (Elgeyo Marakwet County Integrated Development Plan, 2023-2027).

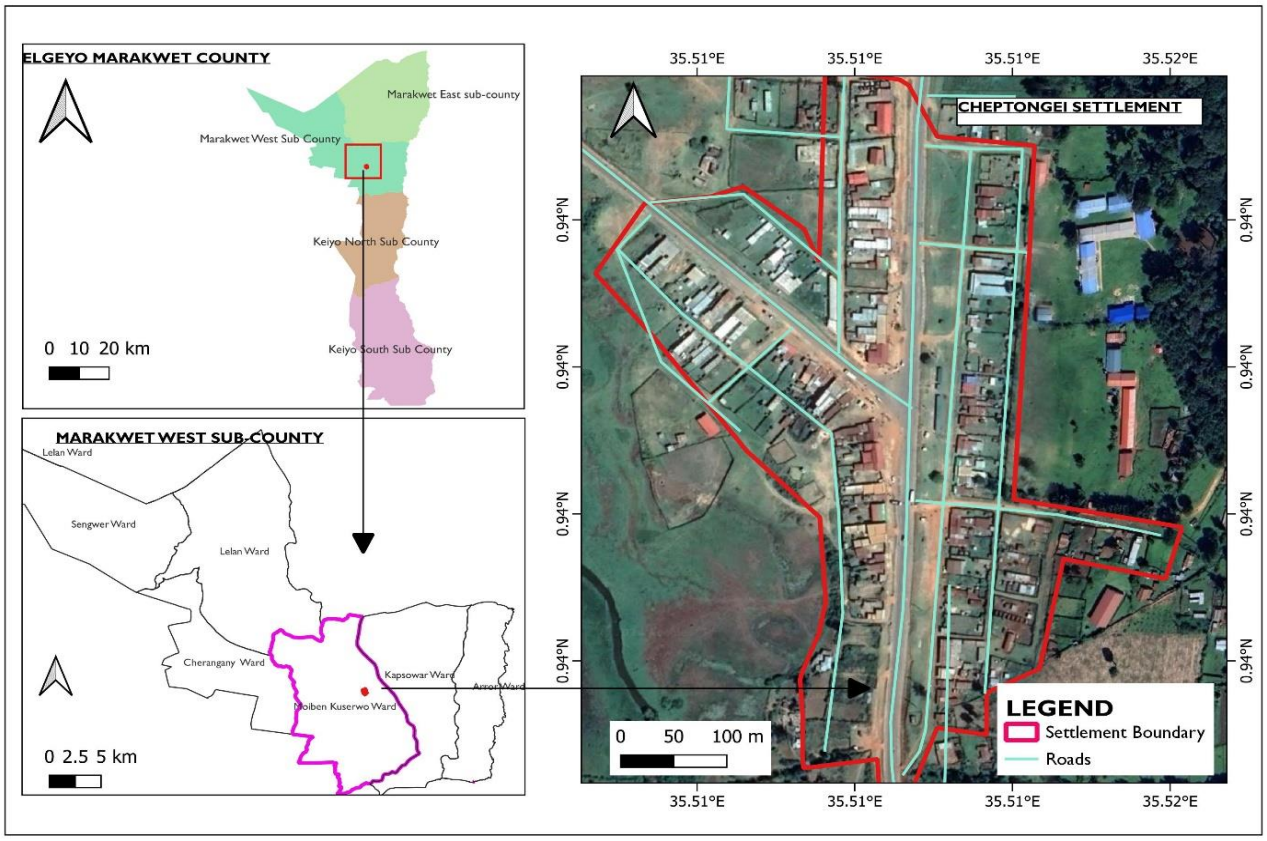


Figure 3: Cheptongei project areas map
(Source: Sobocon Design team, December 2023)

2.3. Project Scope

The proposed project and its components comprise of construction of 2770m internal roads with 6-14m reserve width, 3640m storm water drainage network, Tertiary service lines of Water Supply Reticulation Network and household connections, 1Nr. Ablution block with septic tank, 10Nr. Street light and 2 No. High mast floodlights. Road network infrastructure component has been mainly categorized as main settlement access roads and internal settlement roads. The width of the design corridors is subject to availability of space on site.

During multiple interactions with residents, the installation of street and security lighting emerged as a top priority. The focus was on improving security in walk alleys, particularly during early

mornings and late nights when pedestrians are at risk of encountering criminal activities. These lighting measures aim to mitigate potential security threats, creating a safer environment for residents commuting to and from work.

Small-scale vendors operating along these streets also face heightened insecurity, negatively impacting economic activities in the area. Recognizing these challenges, a significant number of residents proposed the installation of monopole high mast floodlights at selected sites and street lighting along specific stretches of roads. The intention is to address the prevailing insecurity and foster a more secure and conducive environment for both pedestrians and businesses, ultimately contributing to the overall well-being of the community.

Table 5 below summarizes the proposed project details in Cheptongei Settlement. These projects are also in line with the County Priority projects presented in the CIDP 2023-2027 report.

Table 5: Cheptongei project details

Roads/Footpath	Construction of 2770m of roads with 6 to 14m reserve width
Storm Water Drainage	Construction of 3640m of Storm water Drainage Network
Water supply	Construction of Tertiary service lines of Water Supply Reticulation Network and household connections
Sanitation System	Construction of 1Nr. Ablution block and septic tank
Public Lighting	Construction of 10Nr. Street light and 2No. High mast flood lights

2.3.1 Proposed Road layout maps

The lay out maps of the proposed projects are provided in Figure 4 and 5 below.

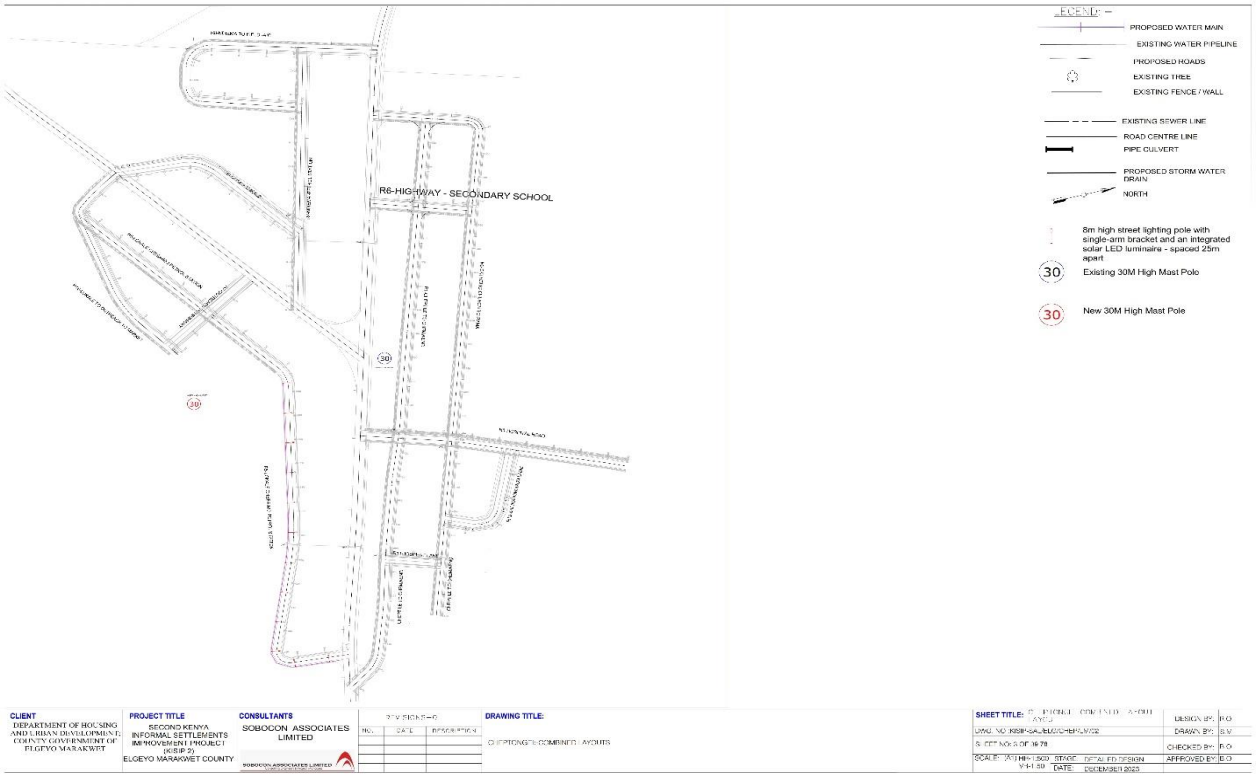


Figure 4: Proposed roads layout maps
(Source: Sobocon Design team, December 2023)

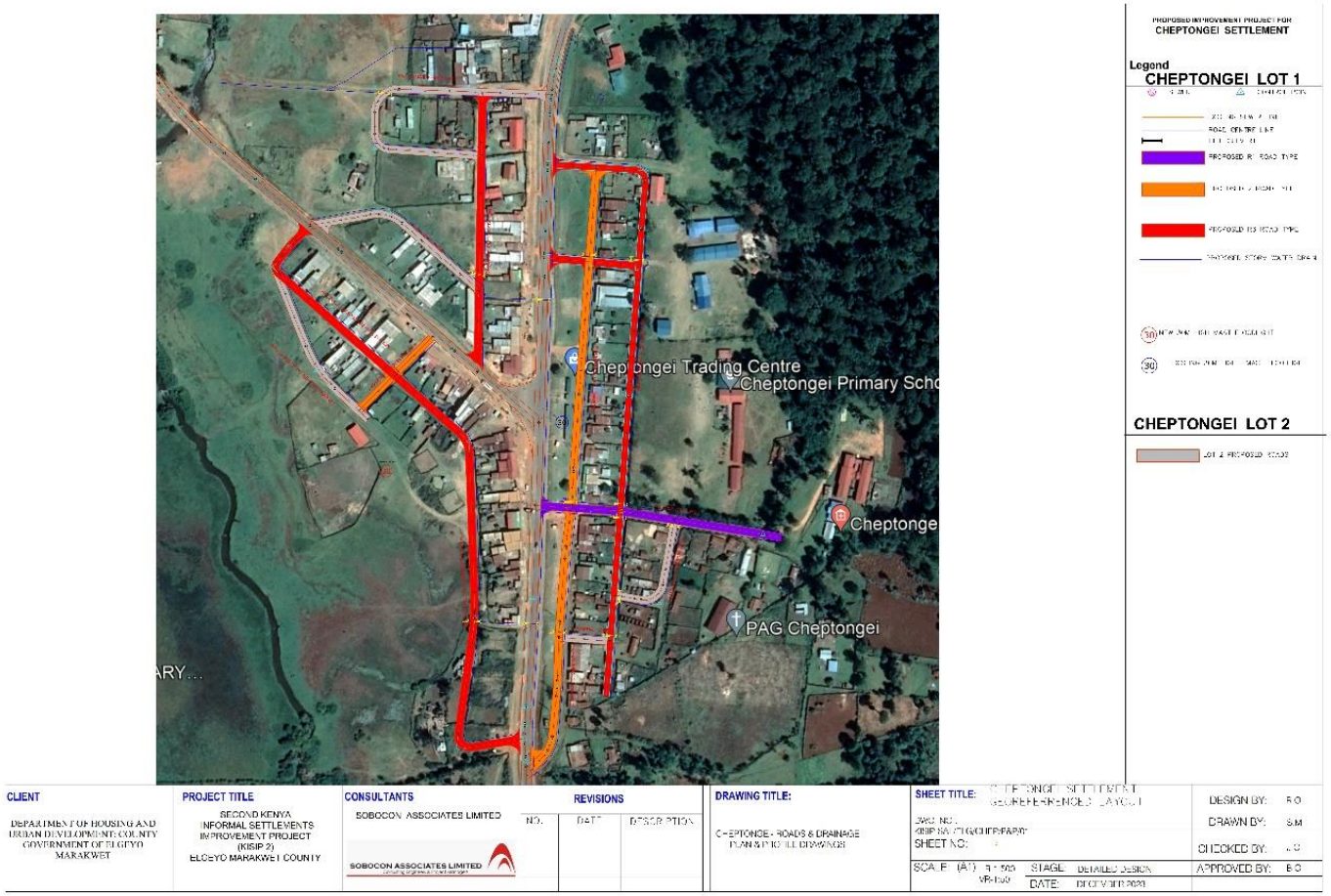
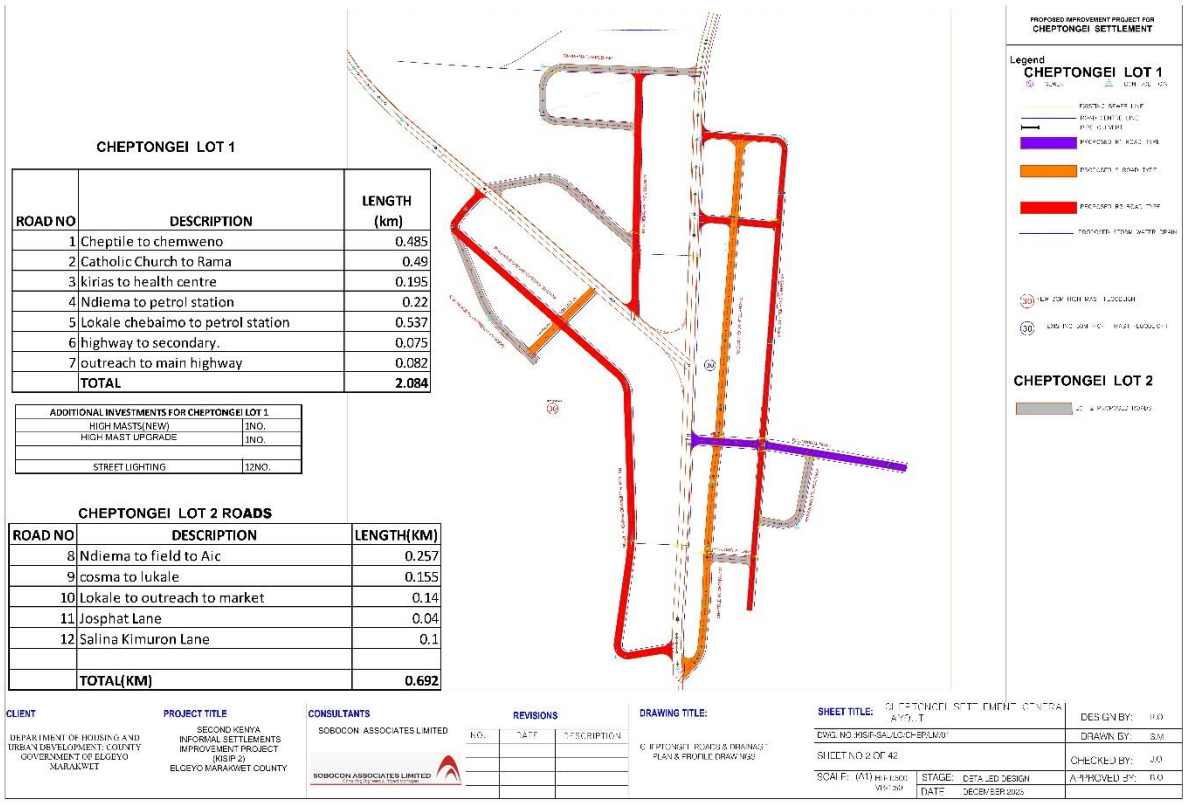


Figure 5: Proposed roads layout maps
(Source: Sobocon Design team, December 2023)



CHEPTONGEI LOT 1

ROAD NO	DESCRIPTION	LENGTH (km)
1	Cheptile to chemweno	0.485
2	Catholic Church to Rama	0.49
3	kirias to health centre	0.195
4	Ndiema to petrol station	0.22
5	Lokale chebaimo to petrol station	0.537
6	highway to secondary.	0.075
7	outreach to main highway	0.082
	TOTAL	2.084

ADDITIONAL INVESTMENTS FOR CHEPTONGEI LOT 1	
HIGH MASTS(NEW)	1NO.
HIGH MAST UPGRADE	1NO.
STREET LIGHTING	12NO.

CHEPTONGEI LOT 2 ROADS

ROAD NO	DESCRIPTION	LENGTH(KM)
8	Ndiema to field to Aic	0.257
9	cosma to lukale	0.155
10	Lokale to outreach to market	0.14
11	Josphat Lane	0.04
12	Salina Kimuron Lane	0.1
	TOTAL(KM)	0.692

Figure 6: Cheptongei Lot 1 Roads and drainage
(Source: Sobocon Design team, December 2023)

2.4. Project design

The concepts that guided the designs were derived from specific instances of engaging the communities directly and incorporating their views. The respective County Government representatives were also engaged and involved at a higher level since they are the implementing authority. All infrastructure projects are guided by existing national standards/laws and county technical by-laws; the designs are based on sound value engineering principles and feasible on the ground.

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

Water and sanitation are intrinsically linked, forming a cohesive unit. The provision of water to an area must be complemented by effective mechanisms for wastewater disposal. In settlements, solid waste, particularly plastics, poses a significant challenge by obstructing already strained waste and storm water drainage systems. Therefore, addressing solid waste management must go hand in hand with drainage considerations.

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

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

2.4.1. Roads and footpath designs

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

- Horizontal alignment,
- Vertical alignment,
- Road cross section

- Super elevation of curves,
- Road widening,
- Junctions and
- Bus bays

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

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

Additionally, the road cross sections, as depicted in the Figure 7 below, contribute to low carbon emissions by potentially optimizing traffic flow, reducing congestion, and enhancing overall road efficiency. This can result in smoother traffic patterns, minimizing idling time for vehicles and subsequently reducing carbon emissions associated with transportation. The road design cross-sections are shown in the Figure 7 below.

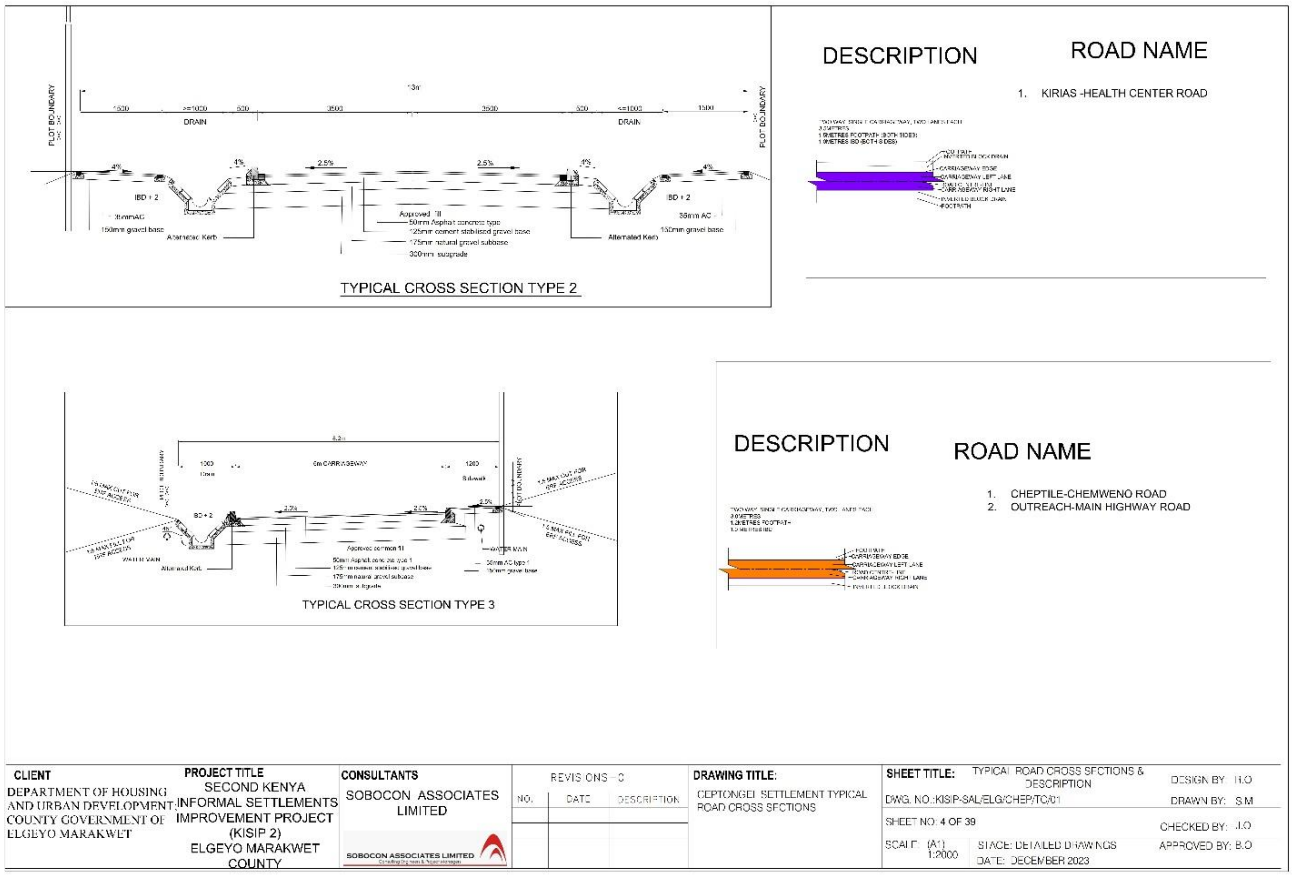


Figure 7: Road cross sectional image
(Source: Sobocon Design team, December 2023)

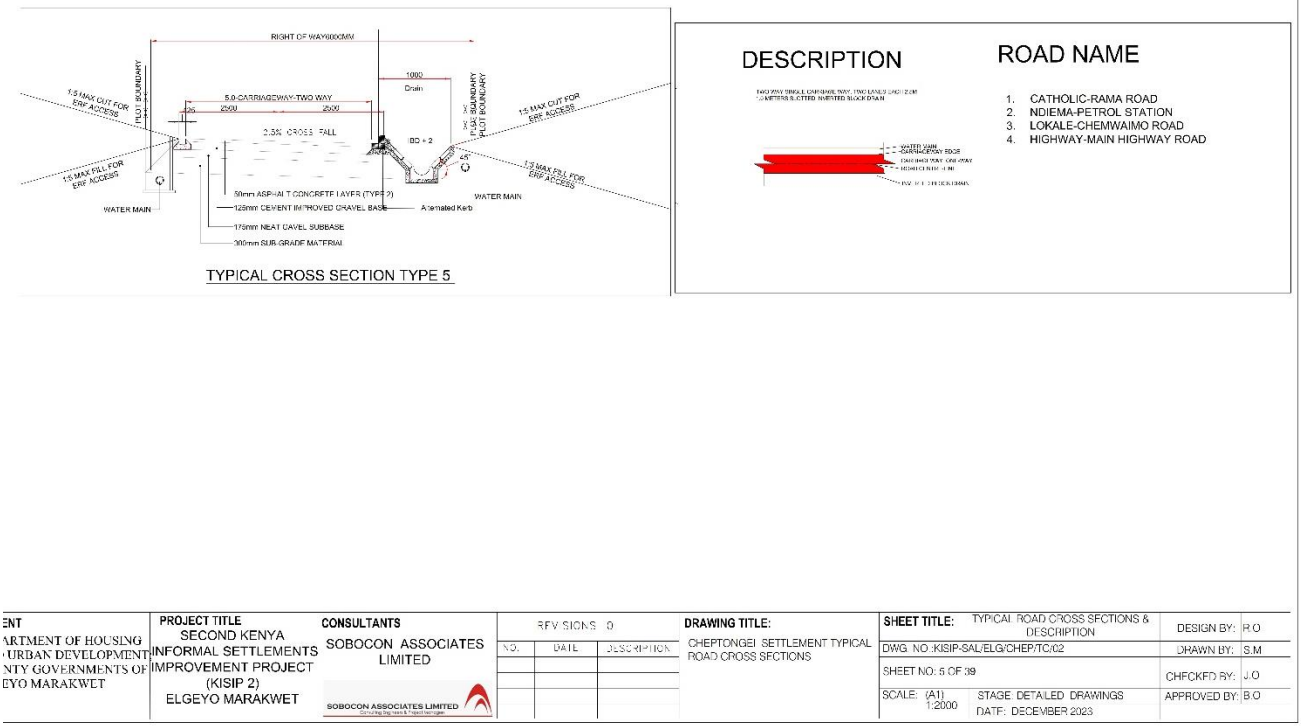


Figure 8: Road cross sectional image
(Source: Sobocon Design team, December 2023)

2.4.2. Drainage Design

The drainage system has been accurately planned to accommodate the natural peak run-off without causing erosion to embankments or any part of the road. These drains are responsible for collecting runoff from the road surface, side slopes, and neighboring areas. Various geographical factors, such as soil condition and rainfall intensity, play a crucial role in determining the shape, location, and capacity of these drains.

In settlements, the primary drains are designed as covered rectangular channels, with their dimensions, determined based on runoff volumes estimated using Lloyd Davis' Rational formula. The actual size of the drainage structure section is calculated using Manning's formula for hydraulic considerations.

This comprehensive approach ensures that the drainage system can effectively manage climate resilience during flood seasons. The ability of the drainage to handle sufficient water volumes is vital in preventing flooding within the settlements. The proposed project and its designs have incorporated the following:

Preventing Erosion: By efficiently managing natural peak run-off and preventing erosion to embankments or road structures, the drainage system helps maintain the integrity of the road infrastructure. This reduces the need for frequent repairs and reconstruction, which, in turn, minimizes the carbon footprint associated with construction materials, machinery, and transportation.

Optimizing Road Longevity: The prevention of erosion and proper water drainage preserves the road surface, leading to a longer lifespan for the infrastructure. A longer-lasting road requires less frequent maintenance and reconstruction, resulting in reduced carbon emissions associated with construction activities over time.

Efficient Runoff Collection: The drainage system collects runoff from road surfaces, side slopes, and neighboring areas, preventing the accumulation of water that could lead to soil erosion and related carbon-intensive processes. This efficient runoff collection contributes to the overall health of the ecosystem and minimizes the environmental impact associated with sediment transport.

Climate-Resilient Design: The drainage system is designed to handle climate variability, particularly during flood seasons. This climate-resilient approach reduces the likelihood of extreme weather events causing damage to the road infrastructure, which would necessitate extensive repairs and contribute to increased carbon emissions associated with reconstruction efforts.

Smart Sizing of Drainage Structures: The dimensions of the primary drains, determined using Lloyd Davis' Rational formula for runoff volumes and Manning's formula for hydraulic considerations, ensure that the drainage system is appropriately sized. This smart sizing minimizes excess construction materials and resources, optimizing the efficiency of the drainage system and reducing associated carbon emissions.

Well-designed drainage system not only enhances the sustainability and resilience of the road infrastructure but also contributes to a reduction in carbon emissions by minimizing the environmental impact of construction, maintenance, and reconstruction activities.

2.4.3. Public Lighting

The structure of the pole is designed to- ASCE Manual 72:1990 Guide for Design of Steel Pole Structures, BS 3692: ISO Metric Precision Hexagon Bolts, Screws and Nuts, BS 4360: Weldable Structural Steel and BS8100:Part1 & 2 Lattice Towers and Mast – Part 1: Code of Practice for Loading. This design ensuring that the lighting infrastructure is robust and long-lasting. This durability reduces the need for frequent maintenance and replacement, resulting in fewer resources being consumed over the lifetime of the lighting system.

Basic Design Wind Speeds

The monopole is designed, for assessing its structural strength to a Basic Design Wind Speed of 33.33m/s (120 km/hr) 3-second gust speed or 22.22m/s mean hourly wind speed for all sites. This corresponds to a return period of 1 in 50 years. For the purpose of compliance check for maximum deflection (sway) of the monopole, a 1 in 20 years return period wind speed of 30.0m/s (3-second gust) or 20.0m/s mean hourly wind speed shall be used.

Designing the poles and monopoles to withstand high wind speeds ensures that the lighting infrastructure remains intact during severe weather events, reducing the likelihood of damage and the associated environmental impact. This resilience contributes to the overall sustainability of the lighting system.

Basic Design Electrical Component

The initial step in the design process was to establish an optimal arrangement of light fittings on a 30m High Mast Floodlight. The goal was to ensure that even the farthest regions served by the floodlight would meet the minimum lighting requirement of 5 lux, as recommended for light traffic areas by BS 5489-1:2003. To achieve this, 12 units of the Nikkon S2266 LEDXION K10119, each with a power rating of 250W and emitting 33,000 lumens, were equispaced on a luminaire carriage (refer to Figure 7, Luminaire Carriage).

Subsequently, using the Illumination Software Dialux 7.1, a meticulous light distribution design was crafted (depicted in Figure 7, L: Dialux Generated Lighting Coverage for One Mast). This software allowed for precise optimization, ensuring that the emitted light was directed precisely where needed, thereby minimizing both light pollution and wasted energy. As a result of this approach, the lighting conFigureuration was able to meet the specified 5-lux target even at distances as far as 64.49m from the base of the mast (as illustrated in Figures 9 and 10).

These measures collectively contribute to the environmental friendliness of the lighting system by enhancing energy efficiency and minimizing unnecessary light dispersion. LED technology inherently offers high energy efficiency compared to traditional lighting sources, reducing electricity consumption and lowering carbon emissions. Moreover, the use of software-driven optimization ensures that the lighting design meets recommended lighting levels while minimizing energy consumption, ultimately promoting sustainability and environmental responsibility.

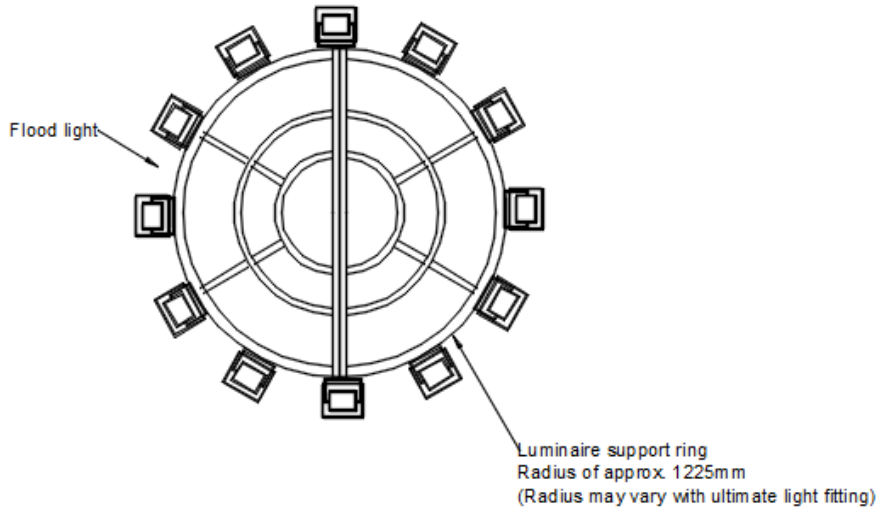


Figure 9: Luminaire Carriage
(Source: Sobocon Design team)

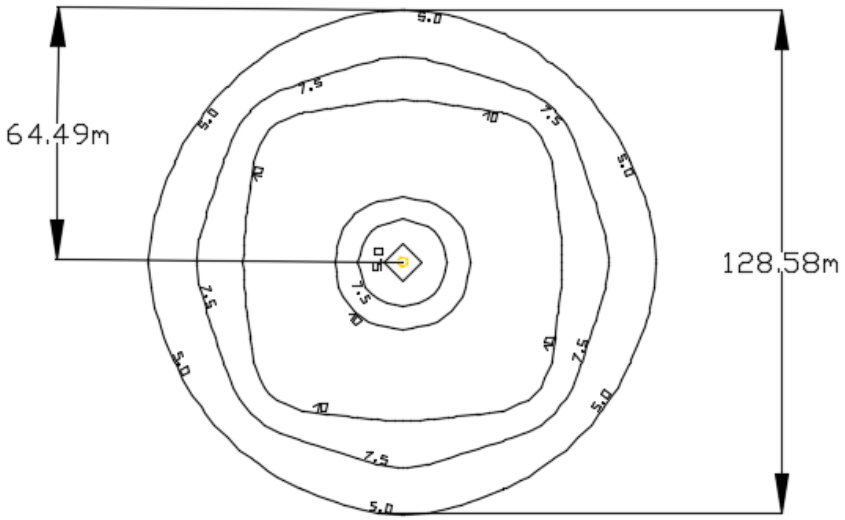


Figure 10: Dialux Generated Lighting Coverage for one Mast

(Source: Sobocon Design team, December 2023)

The design for high mast polls and street light designs are provided in Figures 11 and 12 below.

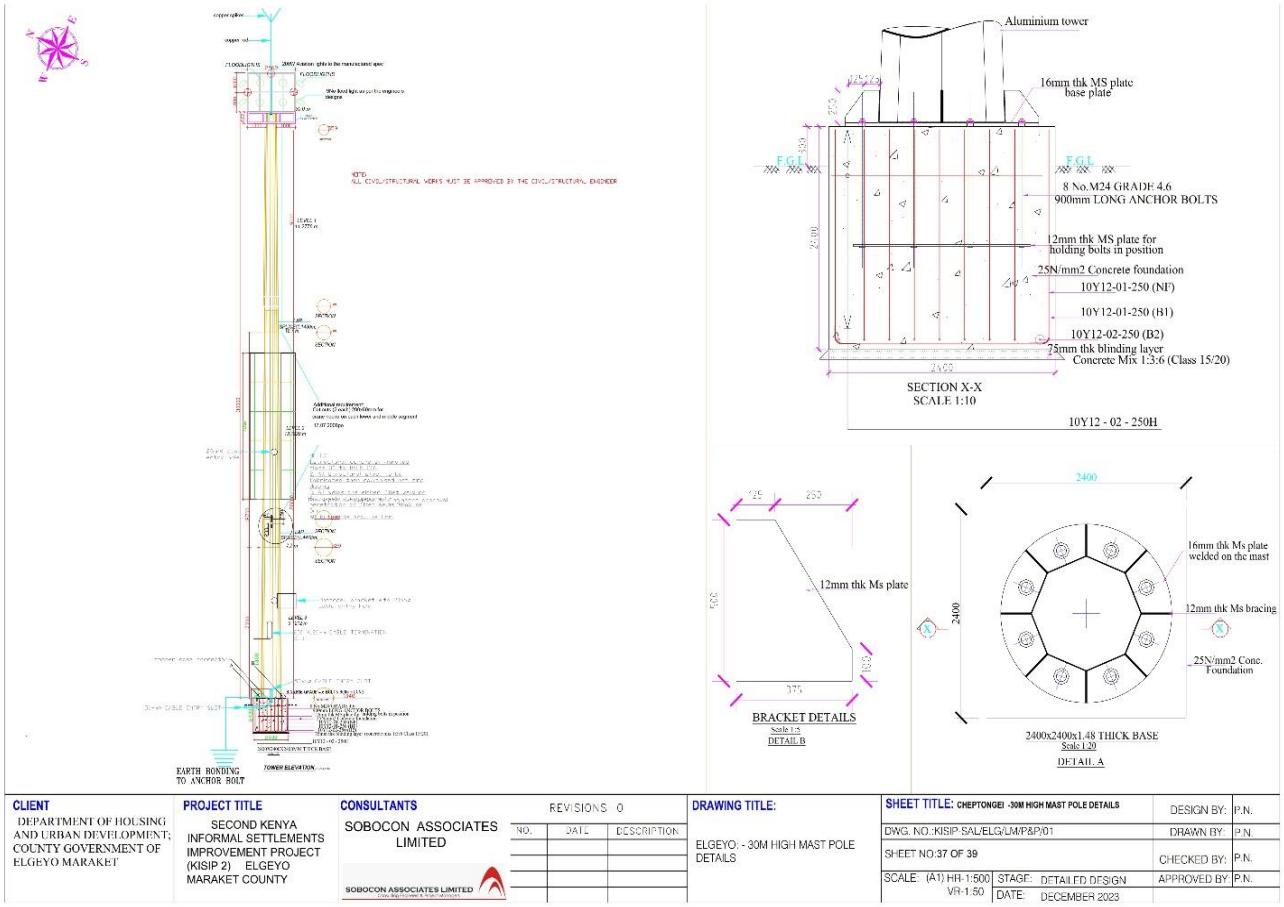


Figure 11: High Mast Pole design details

(Source: Sobocon Design Drawings, December 2023)

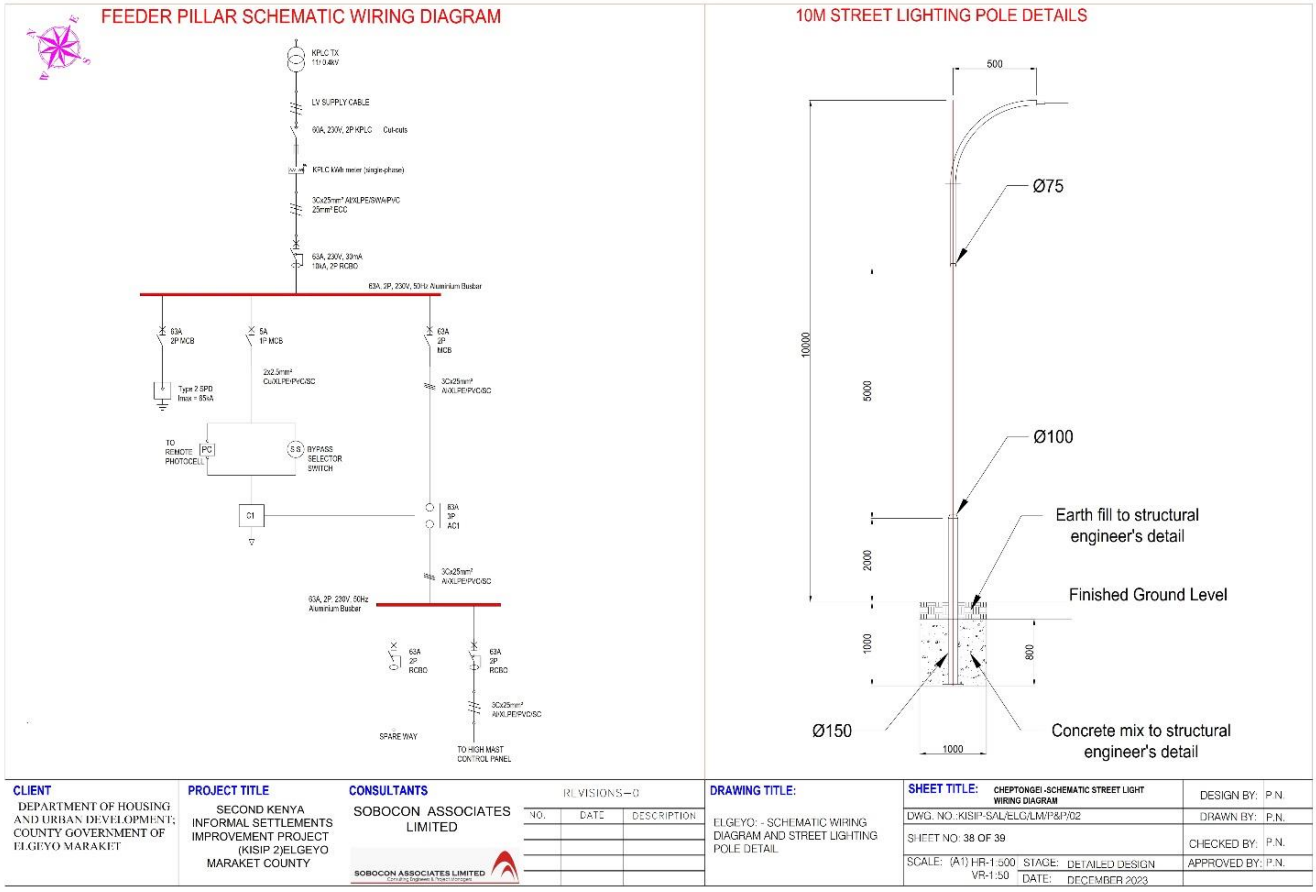


Figure 12: Street light design details

(Source: Sobocon Design team, December 2023)

2.4.4. Water Supply

The Design Criteria was based on the guidelines for design parameters as laid down by the Ministry of Water & Irrigation of the Republic of Kenya in the Practice Manual for Water Supply Services in Kenya, Published in October 2005 (MoWI, 2005). Where the design guideline is silent, other design standards, guidelines or previous experience of project specialists have been used in consultation with appropriate stakeholders. Where appropriate, adjustments to these other guidelines have been made to consider conditions in the project area. For other criteria relevant to detailed design (e.g. structural criteria) the designs will conform to British Standards and other stated standards.

The chosen criteria emphasize functionality, cost effectiveness, environmental compatibility and long-term flexible operation and ease of construction bidding process with reduced maintenance costs. The objectives of this section are to establish the criteria necessary for a realistic engineering design of the water supply system to present reasons behind their selection.

The water supply institutional framework is as illustrated in the Figure 13 below.

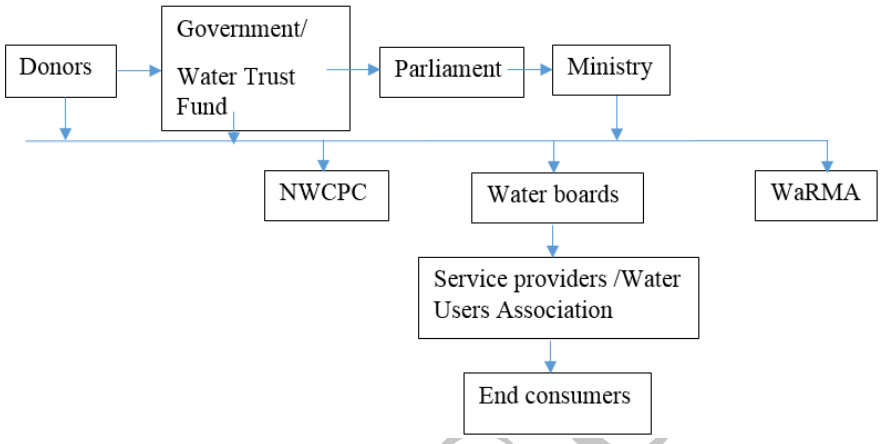


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Figure 13: Water supply institutional framework in Kenya

2.4.4.1. Water Design Calculations

Projections

The year 2025 was considered as the 'initial year'; and 2045 as the 'ultimate design year', these time spans were then used in establishing the water demand.

The geometric progression formula below was then used to project population in the different design time spans while compounding the results at each stage;

$$M = P\left(1 + \frac{r}{100}\right)^{t}$$

Where; M = Ultimate year's demand

P = Initial year's demand

r = Population growth rate for the Settlement Area

t = Time period

The projections were therefore as calculated in the attached calculations in the appendices

2.4.4.2. Service Level

Based on the ***Ministry of Water, Water Design Manual, 2005, Chapter 2, Table 2.1, pg. A26***, from the service level distribution over the design years, the service level table was generated for the study areas, based on the assumption that the settlements are low class housing urban areas.

Table 6: Service Levels

	IC %			NC %		
	Initial	**Future**	**Ultimate**	**Initial**	**Future**	**Ultimate**
Urban Areas						
High and Medium Class Housing	100	100	100	0	0	0
Low class Housing	10	30	50	90	70	50
Rural Areas						
High potential	20	40	80	80	60	20
Medium potential	10	20	40	90	80	60
Low potential	5	10	20	95	90	80

(Source: Sobocon Design report, December 2023)

2.4.4.3. Consumption rates

The water demand for the settlements were computed based on the guidelines provided in the ***Ministry of Water, Water Design Manual, 2005, Chapter 2, Table 2.2, pg. A30 (Appendix iii),*** considering the settlements as low class housing urban areas.

Table 7: Consumption rates

CONSUMER	UNIT	RURAL AREAS			URBAN AREAS		
		High potential	Medium potential	Low potential	High Class Housing	Medium Class Housing	Low Class Housing
People with individual connections	l/head/ day	60	50	40	250	150	75
People without connections	l/head/ day	20	15	10	-	-	20
Livestock unit	l/head/ day	50			-		
Boarding schools	l/head/ day	50					
Day schools with WC without WC	l/head/ day	25 5					
Hospitals Regional District other	l/bed/ day	400 200 100 }			+ 20 l per outpatient and day (minimum 5000 l/day)		
Dispensary and Health Centre	l/day	5000					
Hotels High Class Medium Class Low Class	l/bed/ day	600 300 50					
Administrative offices	l/head/ day	25					
Bars	l/day	500					
Shops	l/day	100					
Unspecified industry	l/ha/day				20,000		
Coffee pulping factories	l/kg coffee	25 (when re-circulation of water is used).					

(Source: Sobocon KISIP II Design report, December 2023)

2.4.5. Sanitation

2.4.5.1. Septic Tanks and Soak Pits Designs

Septic tanks are rectangular chambers, usually sited just below ground level; they receive both excreta and flush water from flush toilets and all other household wastewater. The mean hydraulic retention time in the tank is usually 1 to 3 days. During this time, the solids settle to the bottom of the tank where they are digested anaerobically, and a thick layer of scum is formed at the surface. Although digestion of the settled solids is reasonably effective, some sludge accumulates and the tank must be desludged at regular intervals, usually once every 1 to 5 years.

A two-compartment septic tank is preferred to one with only a single compartment because the suspended solids concentration in its effluent is considered lower.

Figure 14 shows a variety of alternate designs, including an experimental septic tank in which an anaerobic up flow filter is substituted for subsurface systems for effluent disposal.

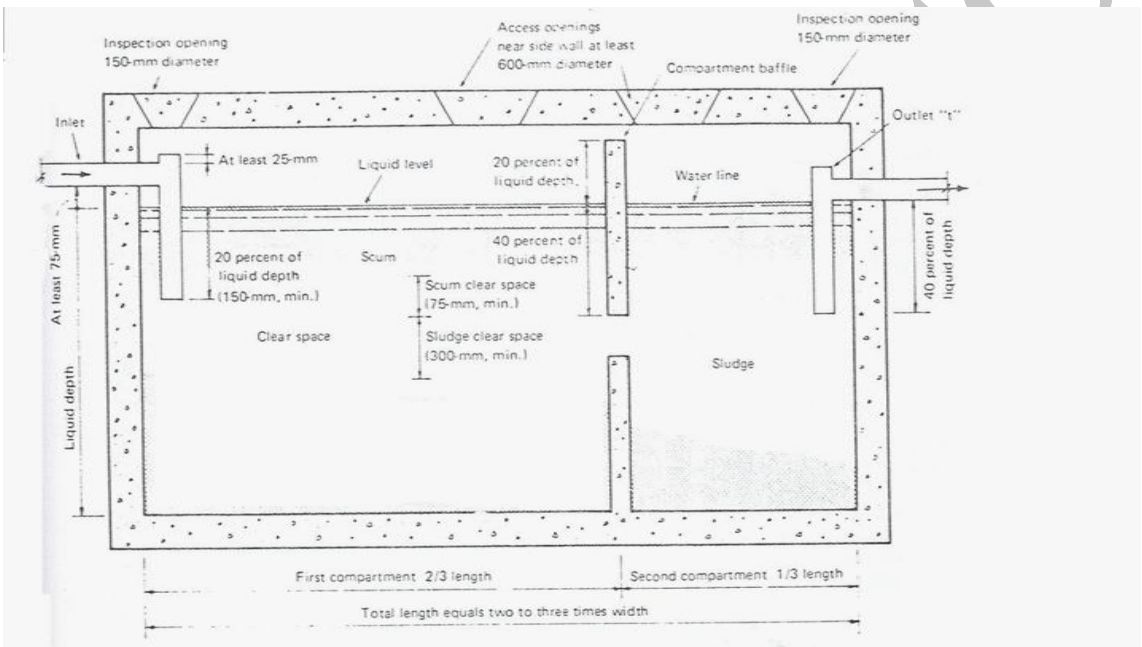

Figure 14: Schematic drawing for typical septic tank
(Source: Sobocon KISIP II Design report, December 2023)

2.4.5.2. Soak pit

Pits used to dispose of effluent from septic tanks are commonly 2-5 m deep with a diameter of 1.0-2.5 m. The capacity should not be less than that of the septic tank.

Depending on the nature of the soil and the local cost of stone and other building material, soak pits may either be lined or filled with stones or broken bricks. Linings are generally made of bricks, blocks or masonry with honeycomb construction or open joints as for the linings of pit latrines. The infiltration capacity of the soil may be increased by filling any space behind the lining with sand or gravel hard material such as broken rock or broken kiln-dried bricks not less than 50 mm in diameter may be used to fill an unlined pit

Whether the main part of the pit is lined or filled, the top 500 mm should have a ring of blocks, bricks or masonry with full mortar joints to provide a firm support for the cover. The ring may be corbelled to reduce the size of the cover. Covers are usually made of reinforced concrete and may be buried by 200-300 mm of soil to keep out insects.

Increasing the diameter of the pit results in a disproportionate increase in the volume of excavation and in the cost of the cover slab compared with the increase of wall area. Therefore, if the required infiltration area is large, it may be more economical to provide drainage trenches.

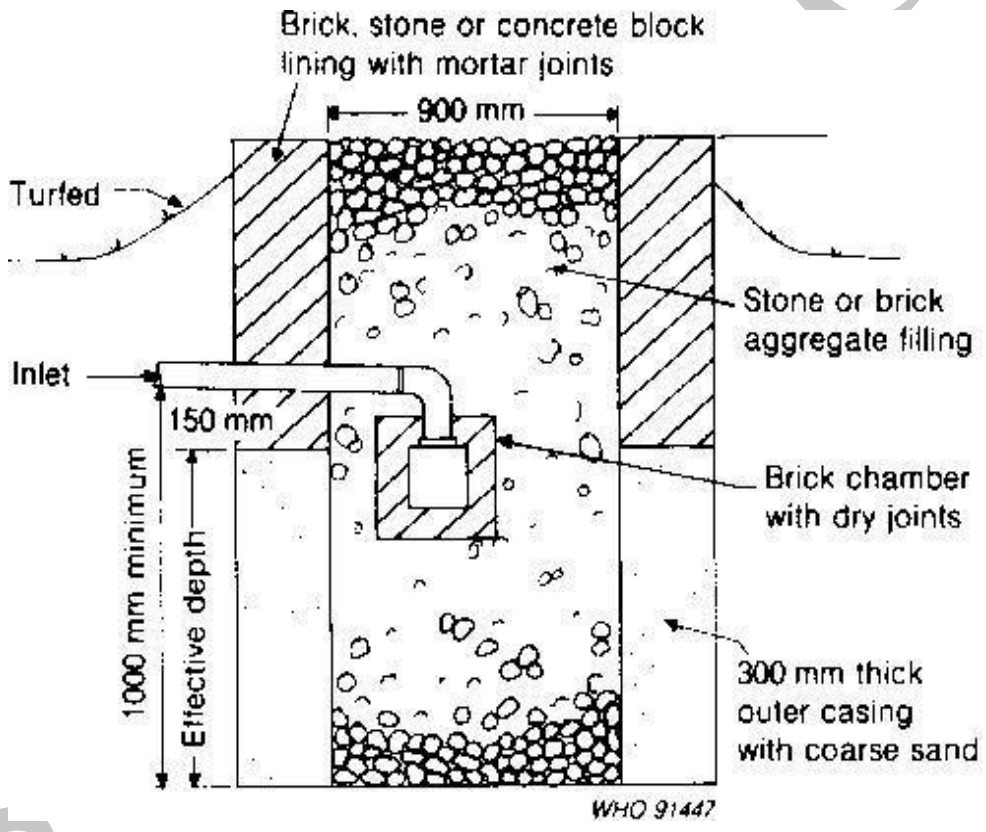

Figure 15: Lined soak pit
(Source: Sobocon KISIP II Design report, December 2023)

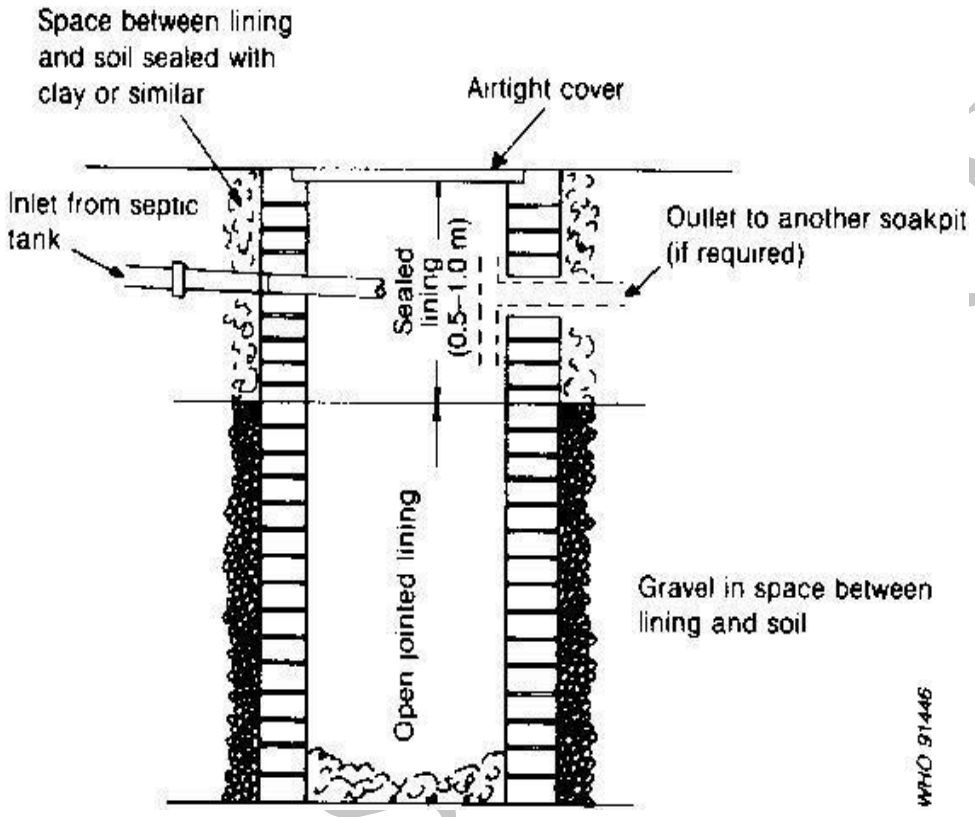

Figure 16: Unlined soak pit
(Source: Sobocon KISIP II Design report, December 2023)

2.5. Project Cost

The estimated project cost for Elgeyo Marakwet County KISIP 2 projects is Kenya shillings One Hundred and Seventy-Five Million, Two Hundred and Seventy-Six Thousand, Seven Hundred and Fifty-Eight Shillings only (KES. **175,276,758**). The statutory charge of 0.1% payable to NEMA is therefore Kenyan Shillings One Hundred and Seventy-Five Thousand, Two Hundred and Seventy-Six Shilling and Seventy-Six cents only (KES 175,276.76) pursuant to Gazette Notice No. 13211 of Regulation 48 of the Environmental (Impact Assessment and Audit) Regulations, 2003. The payment is done on the e-citizen platform after receipt of an invoice from NEMA.

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CHAPTER THREE

3. ANALYSIS OF PROJECT ALTERNATIVES

This chapter presents the different alternative considerations in terms of design, site location, technology used to ensure that environmental considerations are taken into account for the proposed developments. KISIP II project selection was done through consultations with the communities through the elected Settlement Executive Committee team to ensure a holistic and community-centered approach. This was done to ensure viable project selections that minimize negative impacts while aligning with the settlement's unique characteristics and needs. Considerations that were evaluated include:

3.1. Settlement selection

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

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

Location: The proposed project sites are located within the urban areas of the settlement with no sensitive environmental features.

Settlement size and density: Cheptongei Settlement has a population of 2032 with projections indicating a high of 4300 people by the year 2025. (CIDP report)[5] and hence a priority in benefitting from the investments.

[5] Elgeyo Marakwet County Integrated Development Plan (CIDP) 2023-2027

Scale of potential displacement of residents: The proposed development is situated in areas with minimal displacements especially along the wayleaves.

Proximity to trunk infrastructure: The proposed projects are implemented is settlements areas with close proximity to core trunk infrastructure (such as roads and trunk lines for water, sewage or electricity) and these are the ones in the priority list.

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

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

3.2. Construction of Proposed infrastructure projects

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

3.3. Design Alternatives

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

i. The streetlights were designed to accommodate both solar energy and national grid.

ii. Due to varied widths of the road alignments for the settlements, specific cross sections were proposed for each alignment fitting the necessary services within the available space

iii. The topography of the settlements brings out unique surface runoff drainage challenges. There are a number of localized drainage problems where natural drainage system to the

existing waterways lacks. In such cases, vertical drains were proposed to address such challenges

3.4. Design Standards

3.4.1. Design approach

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

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

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

3.4.2. Drainage Systems:

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

3.4.3. Roads Alternatives

The available alternative technologies considered include the prefabricated concrete panels, tarmacked roads and conventional concrete roads. The roads will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. The technology to be adopted for example-tarmacked roads will be the most economically viable and sensitive to the environment.

3.4.4. Lighting and electric Alternatives

i. Solar powered alternative

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

ii. Electricity Grid alternative

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

3.4.5. Evaluation criteria

The evaluation criteria for choosing the best design alternatives is provided in table 8 below.

Table 8: Design evaluation criteria

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

3.5. The 'Yes' Project Alternative

This option envisages that the proposal will be implemented. It was considered as the most viable because of the following reasons; Employment creation, enhanced visibility and security, reduced storm water flooding and promotion of businesses either directly or indirectly, improved sanitation and environmental conditions in Cheptongei Settlement.

3.6. No project alternative

This alternative maintains the status quo. It is the most environmentally friendly alternative. However, it also means that all the socio-economic benefits that are envisioned to accrue from implementation of the project shall be foregone. The most important one being improving the living standards of the inhabitants of Cheptongei Settlement. The benefits, of this alternative is that the bio – physical condition of the project area will remain intact and any of the negative impacts anticipated from the development would not occur.

CHAPTER FOUR

4. BASELINE ENVIRONMENTAL CONDITIONS

4.1. Environmental Baseline Conditions

The Baseline conditions of the project site were assessed and documented for the purposes of determining the future impacts of the proposed project on the environment and social aspects of the local community. This section details on the findings of the survey which form basis for impact monitoring plans and improvement of the environmental and social performance of the project during implementation. The baseline environment (physical, biological and socio-cultural) for the proposed project locations are presented below:

4.1.1. Physical environment

Elgeyo Marakwet County has a relatively cool climate with varying levels of rainfall across the county. This is due to the county's geomorphology and topography, which is characterized by three distinct agro-ecological zones, the Highlands to the west, the Escarpment (Hanging Valley), and the Lowlands (Valley) to the east. The altitude varies greatly within the county, from 900 m above sea level in the Valley to over 3000 m above sea level in the Highlands, resulting in significant differences in climatic conditions. The average maximum temperature in the county ranges from 25^{o}c to 28^{o}c, while the average minimum temperature ranges from 18^{o}c to 22^{o}c.

The project area climate is classified as warm and temperate. The precipitation levels in the city of Iten are noteworthy, as there is a considerable amount of rainfall even during months that typically experience dry weather. Köppen and Geiger classify this climate as Cfb. In Iten, the mean yearly temperature amounts to 18.8 °C | 65.8 °F. The annual rainfall is 1469 mm | 57.8 inches. The least amount of rainfall occurs in December and is measured at 38 mm | 1.5 inch. On average, the highest amount of rainfall occurs during August with a mean value of 307 mm | 12.1 inch.[6](Elgeyo Marakwet County Integrated Development Plan, 2023-2027). The area climate by month is provided in Figure 17 below.

[6] Iten climate: Weather Iten & temperature by month (climate-data.org)

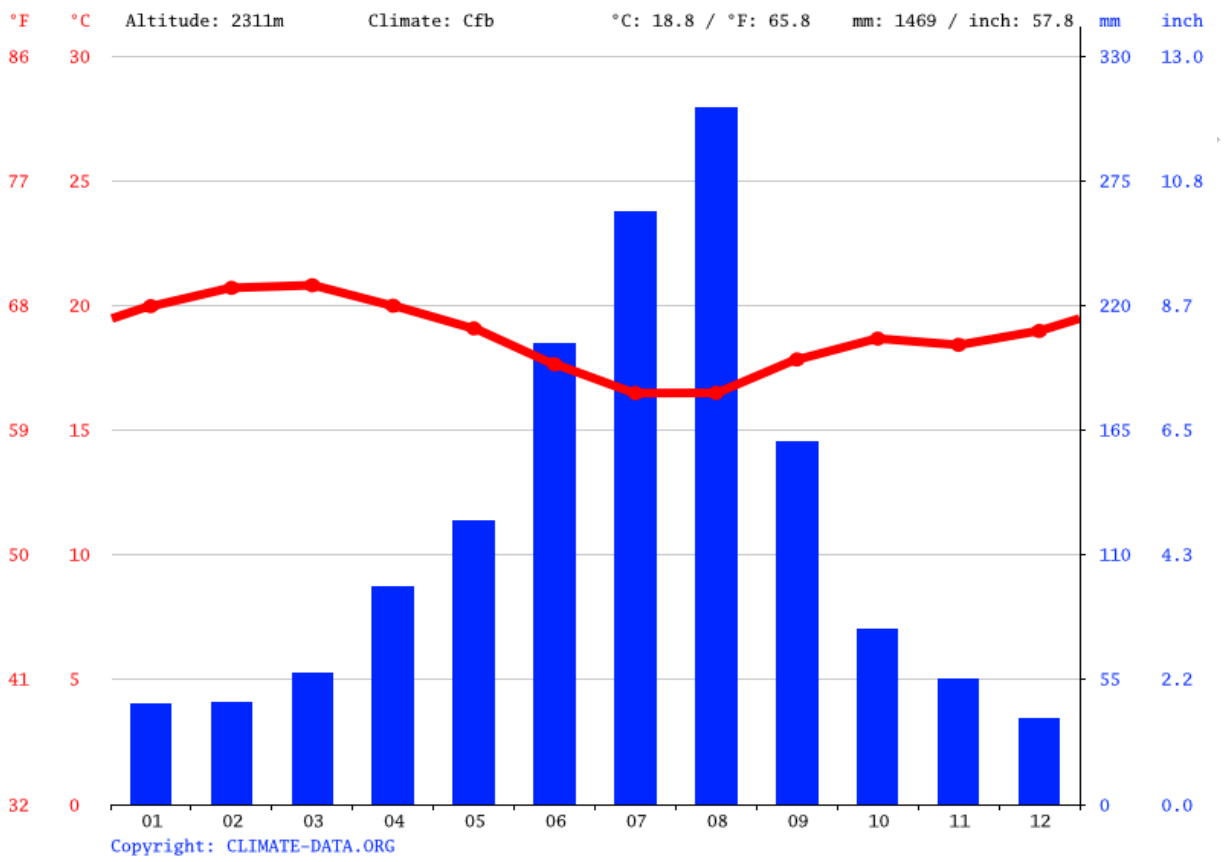

Figure 17: The area weather by month

Source: Elgeyo Marakwet CIDP report 2023-2027

The temperatures are highest on average in March, at around 20.8 °C | 69.5 °F. On average, the month of July is considered to be the coldest time of year with temperatures averaging at around 16.5 °C | 61.7 °F.[7] Iten monthly temperature data is provided in Figure18 below.

Average temperature by month Iten

[7] Iten climate: Weather Iten & temperature by month (climate-data.org)

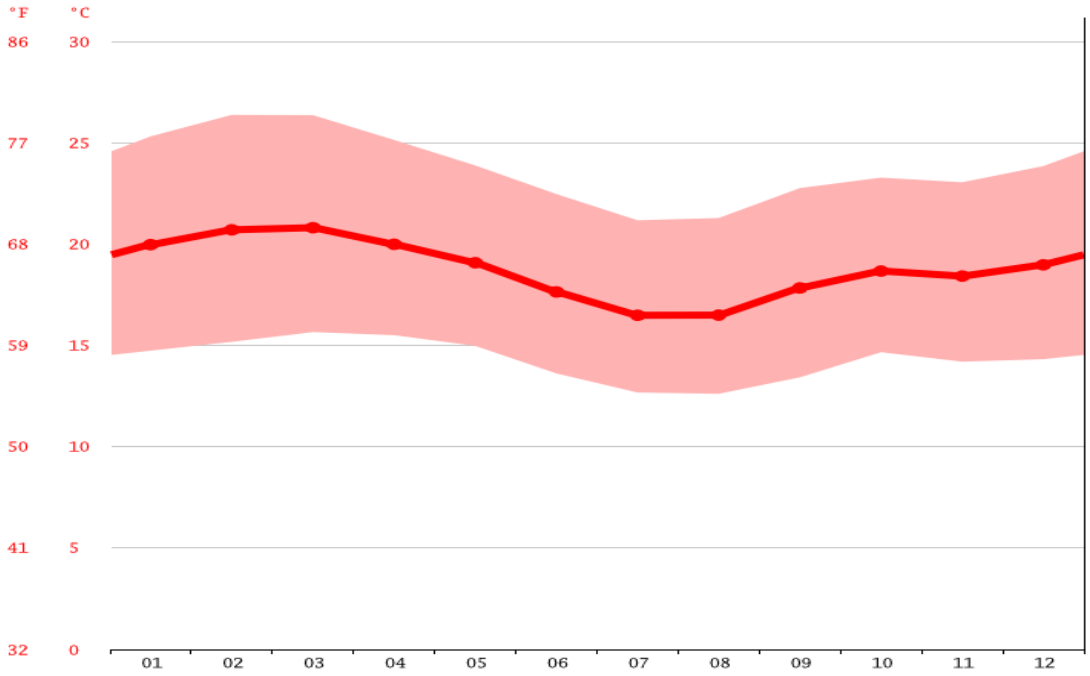

Figure 18: The area monthly temperature data

Source: Elgeyo Marakwet CIDP report 2023-2027

4.1.2. Hydrology

The average annual rainfall varies across the region, ranging from 700 mm in the semi-arid Valley to 1700 mm in the Keiyo and Marakwet Highlands (Cherangany Hills). Altitude plays a significant role in shaping rainfall patterns, with elevations ranging from 900m a.s.l. in the Kerio River Valley to over 3000m a.s.l. in the northern and southern highlands. Rainfall is lowest in the North Eastern lowlands, increasing as you move towards the central highlands (plateau), and peaking above 1500mm in the northwestern corner and certain southern areas of the county. This gradient results in a consistent trend of decreasing rainfall from west to east, with the eastern lowlands typically experiencing the lowest and least reliable rainfall, making them particularly vulnerable to droughts.

Regarding temperatures, there's a general uniformity across the county, with mean annual temperatures typically below 22°C. The Elgeyo-Marakwet Escarpment, covering much of the

western and central parts of the county, experiences the lowest mean annual temperatures, while the eastern lowlands record the highest temperatures.

In terms of atmospheric conditions, relative humidity ranges between 53% and 69%, while wind speed averages around 8 knots (15 km per hour) (Elgeyo Marakwet County Integrated Development Plan, 2023-2027). Figure 19 below presents the Average Rainfall for Elgeyo Marakwet County.

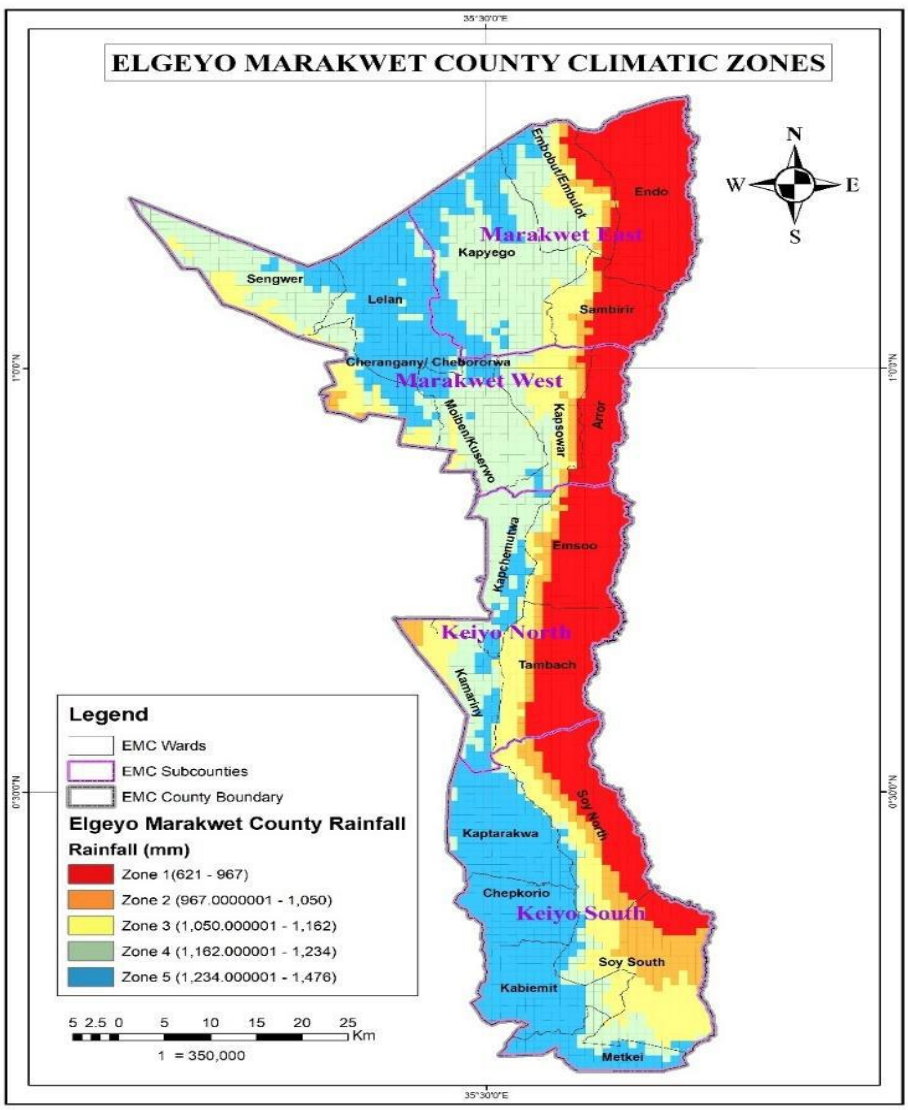

Figure 19: Elgeyo Marakwet County Average Rainfall

Source: Elgeyo Marakwet CIDP report 2023-2027

4.1.3. Ecological Conditions

Elgeyo Marakwet County has three distinct ecological zones, the Highlands, the Escarpment, and the Valley. The Highlands, which constitute 49% of the county's total land area, are suitable to produce dairy cows, wool from sheep, potatoes, maize, wheat, and beans. In the Escarpment, which makes up 11% of the total land area, crops such as maize, millet, sorghum, and beans are grown despite the risk of soil erosion, landslides, and rock falls. Meanwhile, in the semi-arid Valley, which covers 40% of the county's land area, farmers raise zebu cattle, poultry, goats, and sheep and grow crops such as fruits, millet, sorghum, groundnuts, and green grams. Most of the farmers in the county are smallholders, with an average of 1.36 ha of land, while large-scale farmers have an average of 17.3 ha of land (Elgeyo Marakwet CIDP report 2023-2027).

4.1.4. Topography

The Elgeyo Escarpment stands out distinctly and causes elevation differences of up to 1,500 m. In the northern and southern part of the county, the topography is rugged, giving way to more subdued relief differences going westwards. (Elgeyo Marakwet CIDP report 2023-2027). Cheptongei topographic map is provided in Figure 20 below indicates that the area is gently sloping from the North-Eastern part an altitude of 2408 sloping towards the South Western side towards the river at an altitude of 2386m. The project designs have taken the drainage topography into consideration by ensuring compliance with KS 02-548 1986 specification for precast concrete pipes and fittings for drainage, sewerage and culverts. The design team utilized the findings of topographic and hydrological survey data to design the roads within the settlement.

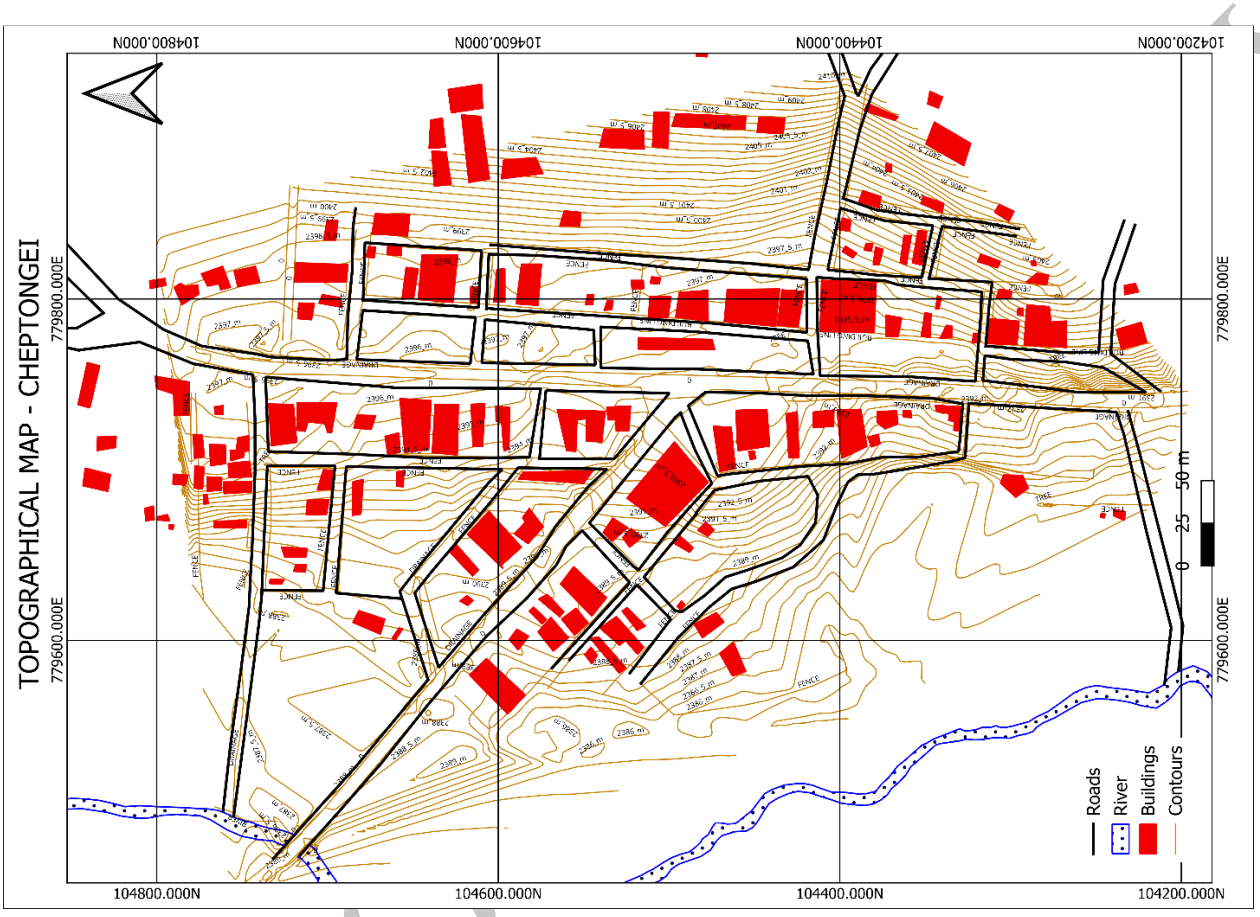

Figure 20: Cheptongei Topographic map
(Source: Sobocon KISIP II GIS maps December 2023)

4.1.5. Drainage

The main source of water for Cheptongei residents is River Moiben, which lies about 500m from the market. The area also has wetlands namely Kampi Zuzu and Kampi Chura. It borders Cherangany Forest, which acts as a water catchment area to the environs.

Plate 1: Moiben River

Constructing roads and drainage systems in the Cheptongei area, nestled amidst the rugged terrain of the Elgeyo Escarpment, can have significant repercussions on the local rivers and tributaries. These infrastructure projects possess the capacity to modify natural drainage patterns, resulting in alterations to the water flow within the watershed. Excavating land for construction activities may expose soil to erosion, particularly in steep areas such as the Elgeyo Escarpment, leading to increased sedimentation in nearby rivers and tributaries, thereby impacting water quality and aquatic habitats. Furthermore, runoff from impermeable surfaces like roads can transport pollutants into water bodies, exacerbating the risk of flooding and compromising water quality. This transformation in drainage patterns and heightened runoff can escalate flooding occurrences in the vicinity, posing threats to both communities and infrastructure. Additionally, habitat fragmentation and changes in flow regimes are potential outcomes of such infrastructure developments. However, measures such as erosion control practices, stormwater management

techniques, and sustainable drainage systems, as outlined in project design section 2.4.2, are integrated by project designers to alleviate these impacts. Adherence to pertinent specifications and standards, such as KS 02-548 1986 for drainage infrastructure, ensures compliance with best practices to minimize adverse effects on rivers and their tributaries.

In the Cheptongei area, characterized by the rugged terrain of the Elgeyo Escarpment, as well as rivers, streams, and diverse topographic contours, the looming threat of flooding is palpable. The presence of water bodies amidst varying elevations indicates areas susceptible to flooding, particularly low-lying regions adjacent to rivers and streams. Intense rainfall events can overwhelm drainage systems, leading to swift runoff into waterways and exacerbating flood risks. Moreover, sedimentation resulting from erosion can reduce the capacity of rivers and streams to convey water, heightening the chances of overflow during periods of heavy precipitation. Human activities such as urbanization and infrastructure development further compound flood risks by altering natural drainage patterns and exacerbating surface runoff. Climate change introduces an additional layer of complexity, with potential alterations in precipitation patterns and heightened frequency of extreme weather events intensifying flood hazards. To address these risks, comprehensive flood risk management strategies are imperative, encompassing floodplain mapping, early warning systems, land use planning, and infrastructure development geared towards boosting community resilience against flooding.

4.1.6. Biological environment

4.1.6.1. Fauna

Observed at the settlement are grazing cows, goats, sheep alongside birds, insects, lizards, and rats. All the species are not endangered and are mostly scavenging on household and dumped wastes.

Plate 2: Grazing animals near Moiben River

4.1.6.2. Flora

The settlement is enveloped by a lush and diverse vegetation cover, boasting a rich array of tree species. Among these are cider, podo, Cyprus, gravellier, Nandi flame, eucalyptus, simotwo, among other unidentified trees. This verdant canopy not only enhances the aesthetic appeal of the area but also plays a crucial role in maintaining ecological balance and biodiversity. The presence of these varied tree species not only provides shade and shelter but also supports a diverse array of flora and fauna, contributing to the overall health and resilience of the local ecosystem. Additionally, the diverse vegetation cover serves as a natural carbon sink, aiding in the mitigation of climate change impacts and fostering a more sustainable environment for present and future generations. Flora observed is mainly comprised of ornamental trees, flowers and grass. The vegetation of concern in Cheptongei is the nearby forest, which is not along the project paths. The settlement is also surrounded by forest cover from the neighboring Cherangany Forest and these acts as an environmental purifier and water catchment area hence leading to high agricultural productivity in the county. The area has a variety of tree species namely; podo, cider, Cyprus, eucalyptus and indigenous trees.


Plate 3:Vegetation cover in Cheptongei

With the onset of KISP II developments, the contractor is advised to undertake selective vegetation clearance and where vegetation is cleared, a compensative re-planting should be undertaken to maintain the areas ecological balance.

4.1.7. Baseline Environmental measurements

8.1.1.1. 4.1.7.1 Baseline Air Quality

Air quality monitoring was undertaken to establish the baseline levels before implementation of the project. The obtained results for SO_X, NO_X, VOCs and PM and are presented in Table 9 below:

Table 9: Baseline Air quality results – Elgeyo Marakwet County

Description	VOCs Average (µg/m³)	SO_X Average (µg/m³)	NO_X Average (µg/m³)
John Bosco high school Cheptongei	63.50	66.14	95.95
Cheptongei shopping center	34.60	43.11	120.11
EMCA Guidelines	**600µg/m³**	**125µg/m³**	**150µg/m³**
WHO Guidelines	**-**	**125µg/m³**	**120µg/m³**

Table 10: Baseline Particulate Matter results

Description	TSP	$PM_{2.5}$	PM_{10}
	Average (µg/m³)	Average (µg/m³)	Average (µg/m³)
John Bosco high school Cheptongei	9.60	7.20	14.30
Cheptongei shopping center	15.10	6.50	24.60
EMCA Guidelines	**500µg/m³**	**75µg/m³**	**150µg/m³**

The baseline parameters measured were all low and within the regulatory limits apart from SOx whose results were above the limits in some areas as presented in Table 10 above. The proponent should ensure that the project activities would not impact negatively to the existing baseline situation. Regular air quality monitoring should be undertaken to ensure that their levels do not exceed the regulatory requirements. Vehicle maintenance should also be undertaken during construction to prevent the further elevation of SOx levels.

4.1.7.2 Baseline measurements for various institutions within the project area

The measurements were taken at John Bosco Secondary school as shown in the plates 4 and 5 below.

Plate 4: Air Quality Measurement at John Bosco Sec School Cheptongei

4.1.8. Baseline Noise

Baseline Noise measurements were carried out along the project areas to establish the baseline status before commencement of the project. The scope of work was assessing the noise exposure levels of environmental noise along the proposed project corridors. Measurements were taken at John Bosco Secondary School Cheptongei and Cheptongei Shopping Center.

Plate 5: Noise Measurement at Cheptongei Shopping Centre

4.1.9. Noise Results

Table 11: Baseline Noise monitoring results

Monitoring Location	LAMax(dBA)	LAMin(dBA)	LAeq(dBA)	Noise Environment Components
John Bosco Secondary School Cheptongei	45.0	35.2	39.4	Vehicular Movement, Human Noise
Cheptongei Shopping Center	77.9	39.6	47.4	Vehicular Movement, Human Noise
EMCA Standards			**60**	
WB/IFC			**70**	

IFC Noise Management Guidelines propose that where predicted or measured noise impacts from a project exceed the applicable noise level guideline at the most sensitive point of reception, noise prevention, and mitigation measures be put in place.

The guidelines indicate that for industrial and commercial areas, noise levels should not exceed 70 dB (A). In residential, institutional, and educational areas, noise levels should not exceed 55 dB (A) during the day (07:00 to 22: 00 Hrs.) and 45 dB (A) during the night (22:00 to 07:00 Hrs.). In both cases, a maximum increase of 3 dB (A) is allowed where background noise already exceeds the guideline value

Table 12: IFC/World Bank Noise Management Guidelines

Receptor	**Maximum allowable LAeq (hourly) in dBA**	
Time Frame	Day: 07:00 – 22:00 hrs	Night: 22:00 -07:00
Residential; institutional; Educational	55	45
Commercial	70	70

4.1.10. Baseline Water Quality

Water sample was collected at the River Moiben was analyzed and their results presented in Figure 21 Below. The detailed water quality results are presented in Annex I(a) of this report.

Chemical Analysis						
PARAMETER	Method	Results	Guide L & H			Ref. Std Limits (Max)
			Low	Opt.	High	
pH*	ISO 10523	6.55				6.5-8.5
Total Suspended Solids (TSS), mg/L	APHA 2540	2.16				30
Nitrate as NO_3, mg/l	ISO 7890	2.70				10
Ammonia Nitrogen, mg/L	ISO 11732	3.08				0.5
Nitrite as NO_2 , mg/L	ISO 6777	0.08				3
Total Dissolved Solids (TDS), mg/l	APHA 2540 C	278.10				1200
Phenol, mg/L	APHA 5530	2.07				Nil
Fluoride as F, mg/L	APHA 4500 F	1.26				1.5
E.coli cfu per 100ml	ISO 9308-1	Nil				Nil
Lead as Pb, in mg/L	ISO 8288	0.03				0.05
Arsenic as As, mg/L	ISO 8288	<0.001				0.01
Cadmium as Cd^{2+}, mg/L	ISO 8288	<0.001				0.01
Selenium as Se, mg/L	ISO 17379	<0.001				0.01
Copper as Cu, in mg/L	ISO 8288	0.017				1
Zinc as Zn, in mg/L	ISO 8288	<0.001				5
Permanganate Value (PV) mg/L	ISO 8467	<0.001				1
Alkyl Benzyl Sulphonates mg/L	ASTM D4711	<0.001				0.5
Total coliform, cfu/100ml	ISO 9308-1	Nil				X^2
Free Residual Chlorine	LWTP 012	0.06				X^2
Chloroform	LWTP 037	Not Detectable				X^2

********End of test results********

Figure 21: River Moibben water quality results

Generally, the water quality for the sample collected at River Moiben as presented in the analysis report indicates that phenols and nitrates had their levels above the regulatory limits. This could have been attributed to organic load from detergents and soap materials. Implementation of this project should ensure that no additional soap detergents and other materials are injected into the system. Regular monitoring will be required to confirm that status of water quality during construction and operations phases of the project.

4.1.11. Solid waste baseline

During the site visit, it was observed that the residents lack a designated waste management infrastructure for the disposal of their solid waste, leading residents to rely on informal collection methods. Notably, some residents use a cattle dip as a solid waste dumping site, while others resort to burning or burying their waste. These actions are significant sources of environmental

pollution and degradation, highlighting the environmental consequences that may be realized over time.

Plate 6: Littered solid waste in Cheptongei Settlement.

Plate 7: Dumping of solid waste

In light of this baseline waste management situation, it is imperative that the road construction project incorporates robust waste management practices. Contractors must adhere to strict guidelines to minimize environmental impact and ensure compliance with local regulations. Given the informal nature of waste handling in the project area, it is essential that contractors collaborate closely with the County government to establish proper waste disposal procedures. Waste generated during construction activities should be properly segregated, with recyclable materials

separated for recycling and non-recyclable waste disposed of in designated areas identified in coordination with the County authorities.

4.1.12. Liquid waste baseline

In Cheptongei Settlement, the absence of a sewer system necessitates that most residents rely on pit latrines for liquid waste disposal. However, these pits occasionally reach capacity, resulting in spillages that contribute to significant water and air pollution in the environment.

Plates 1: Photo of a pit latrine used in Cheptongei

Considering the absence of a sewer system and the reliance on pit latrines for liquid waste disposal in Cheptongei settlement, a contractor should develop a comprehensive plan to manage liquid waste generated from their construction activities. This plan should include provisions for on-site facilities such as portable toilets and handwashing stations to accommodate the needs of construction workers while minimizing liquid waste generation through water-efficient equipment and spillage prevention measures. Additionally, the contractor should ensure proper handling and disposal of liquid waste, adhering to designated disposal areas or facilities that comply with local regulations and environmental standards

4.1.13. Access roads

The roads in Cheptongei are primarily unpaved, resulting in muddy conditions during the rainy seasons and dusty conditions during the dry seasons. This situation is exacerbated by the poor road network and drainage challenges. The images below depict some of the roads surveyed by the project team


Plates 2: Poor Road network in Cheptongei Settlement

The implementation of KISIP II road construction and drainage projects is essential to address these pressing issues. Improving the road network will enhance transportation connectivity, allowing residents to travel more efficiently and access essential services such as schools, hospitals, and markets. Additionally, a well-designed drainage system will mitigate the impacts of erosion, reducing the risk of flooding and safeguarding infrastructure and livelihoods.

4.1.14. Water resources

Residents at Cheptongei primarily rely on River Moiben located just 500 meters from the market and whose catchment is Cherangany Forest. The area also has wetlands namely 'Kampi Zuzu' and 'Kampi Chura' as locally known. It borders Cherenganyi forest which acts as a water catchment area to the environs.

Plates 3:A section of River Moiben

In planning for water use and sourcing in the project area, the contractor should consider assessing the construction water source, storage capabilities, and water conservation measures to minimize water consumption during construction activities. Additionally, the contractor can explore alternative water sources, such as rainwater harvesting or utilizing water from nearby rivers or streams (while ensuring proper permits and environmental considerations).

While obtaining water from different sources, water quality monitoring should be undertaken to ensure that water used for construction activities meets safety and regulatory standards. Regular testing and analysis should be conducted to detect any contaminants or pollutants that may pose risks to human health or the environment.

4.2 Social Baseline Information

The baseline socio-economic survey was conducted from 11th to 15th November 2023. The data was collected using socio-economic survey tool provided in annex VII. Survey was conducted using a sample size of 60 households picked randomly from the settlement.

4.2.1 Sanitation

Latrine coverage in the County is 96.5%. However, open defecation stands at 37% with most households without improved sanitary facilities. This has contributed to the spread of infectious disease vectors and has increased the risk of outbreaks of waterborne and vaccine preventable diseases. Notably the Cholera, Typhoid and Hepatitis B Outbreaks. Unstable soils along the valley and the escarpment consisting of stones is blamed for difficulty in digging pit latrines in those areas (Elgeyo Marakwet County Integrated Development Plan, 2023-2027). All the respondents have access to toilet facilities as shown in Figure 22 below.

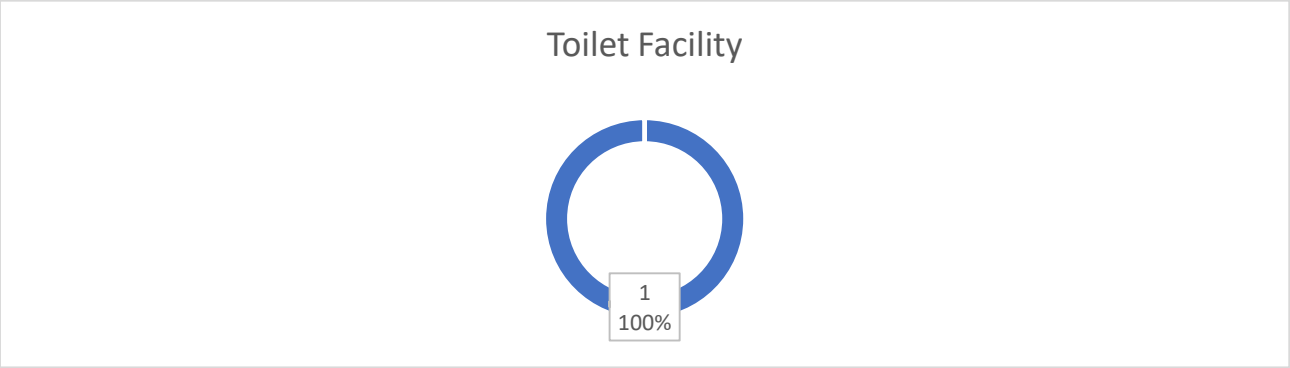

Figure 22: Toilet Facilities

Plate 8: Pit latrine in Cheptongei Centre

4.2.2 Access to essential services

All (100%) of the respondents have access to hospitals, educational institutions and markets. The respondents spend less than 30 minutes to get to the public institutions. Cheptongei primary and secondary are within the locality and offers basic education to the entire community. On health issues, they depend on the private dispensary around the market but a government health facility is some few kilometers away.

Plate 9: Cheptongei Secondary School

4.2.3 Land Use

The settlement in the study area are majorly residential with a small mix of commercial use. The structures in the settlement are diverse ranging from mud housing to masonry permanent housing. The settlements have been adjudicated. Small and medium-sized businesses are located throughout the settlement with residents providing labour for both formal and informal businesses such as industries, small medium enterprises, agricultural activities and Jua kali sector activities.

4.2.4 Population

The total population of the County is 454,468. The population is evenly distributed in terms of gender (227, 317 males and 227, 151 females). The current population of Cheptongei Settlement is 2032 (Elgeyo Marakwet County Integrated Development Plan, 2023-2027).

4.2.5 Land tenure

The proportion of landowners with title deeds in the County is 72.5%. The achievement is attributed to the adjudication of 18 sections of land, which represented 90% of the intended land adjudication level within the plan period (Elgeyo Marakwet County Integrated Development Plan, 2023-2027). Freehold is most predominant land tenure system within the settlement accounting for 55 % while leasehold accounts for 45% of the respondents as shown in Figure. 23 below. Land tenure system within the settlement is private land owned by individual families. However,

proposed infrastructure development shall be undertaken on public land owned by the County government of Elgeyo Marakwet.

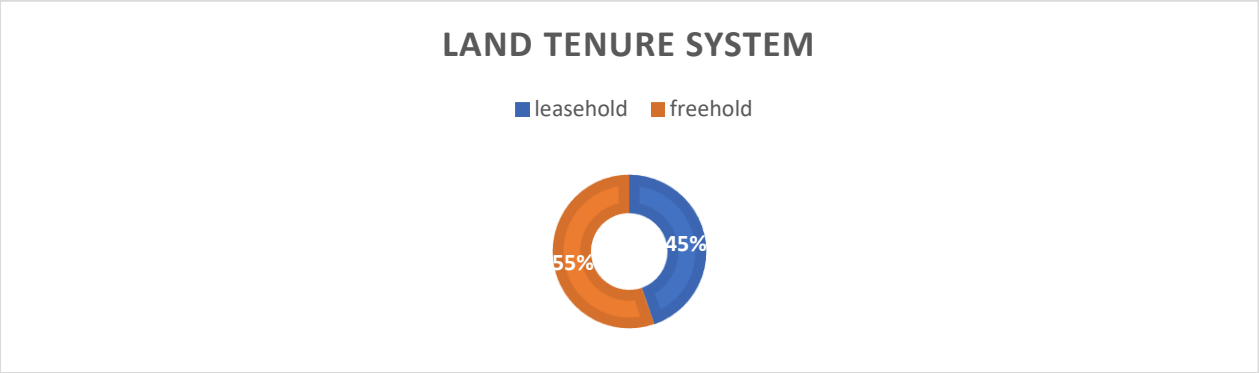

Figure 23: Land tenure system

4.2.6 Age distribution

The results of the National population census conducted in 2019 indicates that the population between the ages of 0-34 years has the largest numbers in all categories and is therefore a priority focus for county development planning. The total number of population aged between 15 to 34 years was 159,973. The county government should direct resources towards addressing critical factors such as healthcare, education, and job creation that impact this group. Additionally, the county government must also plan for its older population (65 - 80+ years) by ensuring adequate healthcare and welfare provisions (Elgeyo Marakwet County Integrated Development Plan, 2023-2027).

According to the findings of the survey, the youths aged 18-35, comprise a significant portion of the population in the settlement, accounting for 43.30%, middle age segment of 36-60 years old are 30.80% and older members of the settlement are 5.80%. The presence of a substantial youth population within the settlement highlights the necessity to invest in both education, economic activities, skills development and youth -focused initiatives to harness their potentials. The youth could also provide a pool of unskilled labour required by the contractor during the implementation of settlement improvement projects. The age distribution of the respondents is presented in Figure 24 below.

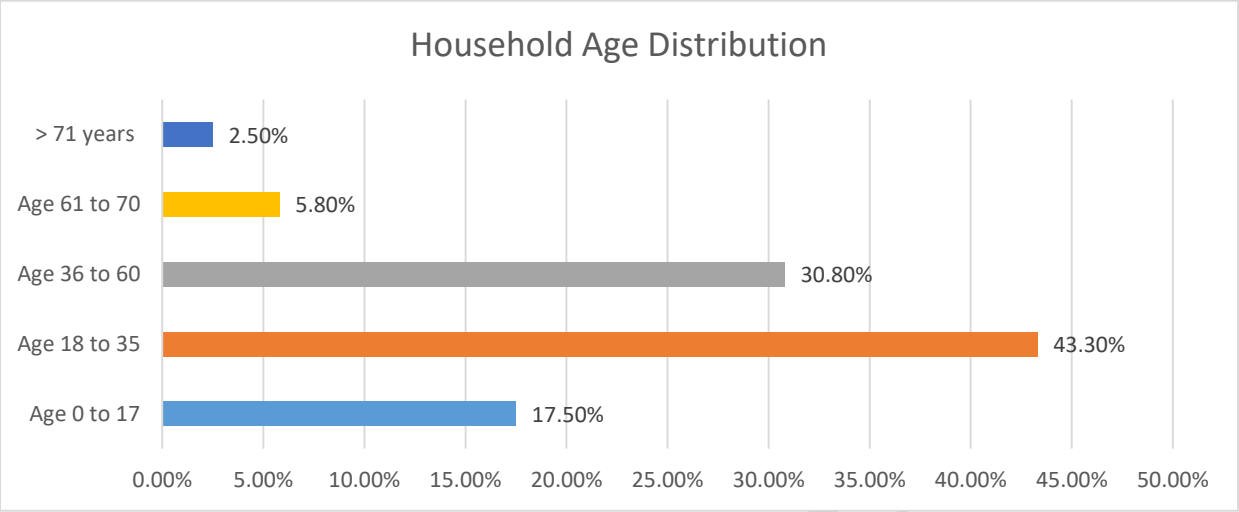

Figure 24: Age distribution

4.2.7 Gender Distribution of the Respondents

The survey data from the respondents indicates that 86 % of household heads were males while 14 % were female. The data suggests that males head most of the surveyed households. Nuclear family is the most preferred family type by most of the respondents interviewed within the project area. The changing cultural and social norms and the high cost of living are driving most people to coalesce around nuclear family setup. The gender distribution is presented in Figure 25 below. Information on gender will also enhance gender mainstreaming into the project activities as per the legal, policy and guiding world best practices i.e. vision 2030 policy.

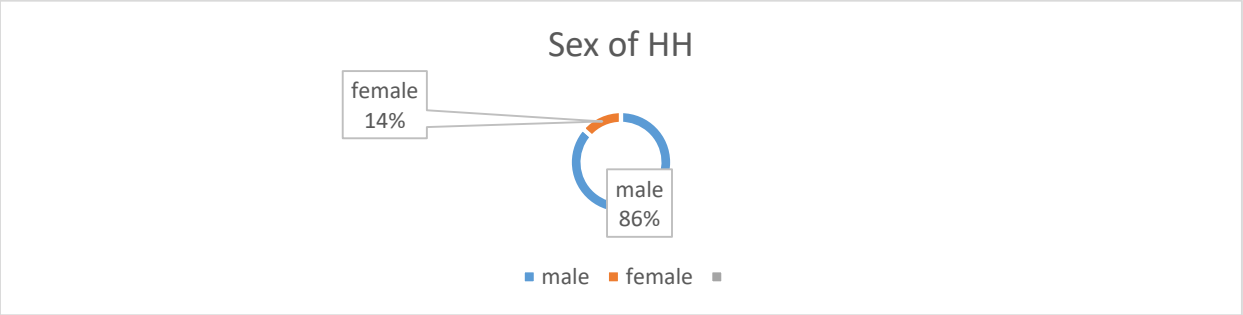

Figure 25: Gender distribution

4.2.8 Marital status

Majority (82 %) of the respondents are married. At the same time, 15 % of the respondents are single. Other categories included Widowers (3%) as shown in Figure 26 below.

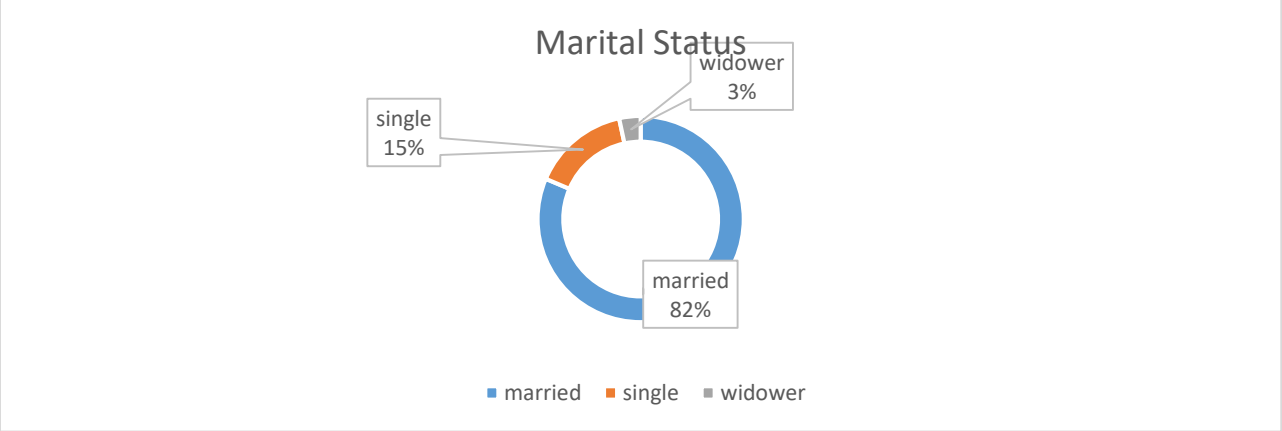

Figure 26: Marital status of the respondents

4.2.9 Religion

All the respondents were Christians as shown in Figure 27 below.

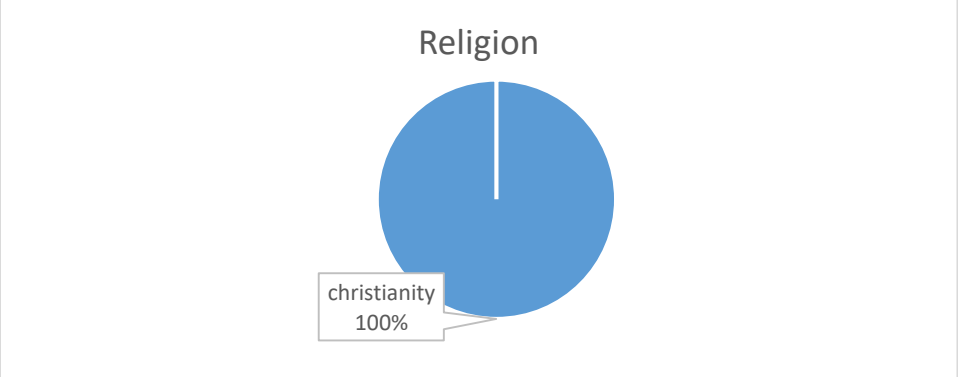

Figure 27: Religion

4.2.10 Male education level

Majority (30%) of the male respondents have attained primary education. Male above graduate (4%), graduate (18%), middle level college (14%) and secondary (23%). Illiterate males accounted for 11% of the respondents. The illiterate population within the project area should be supported to receive project information and be involved in decision making about the project. Male education level is presented in the Figure 28 below.

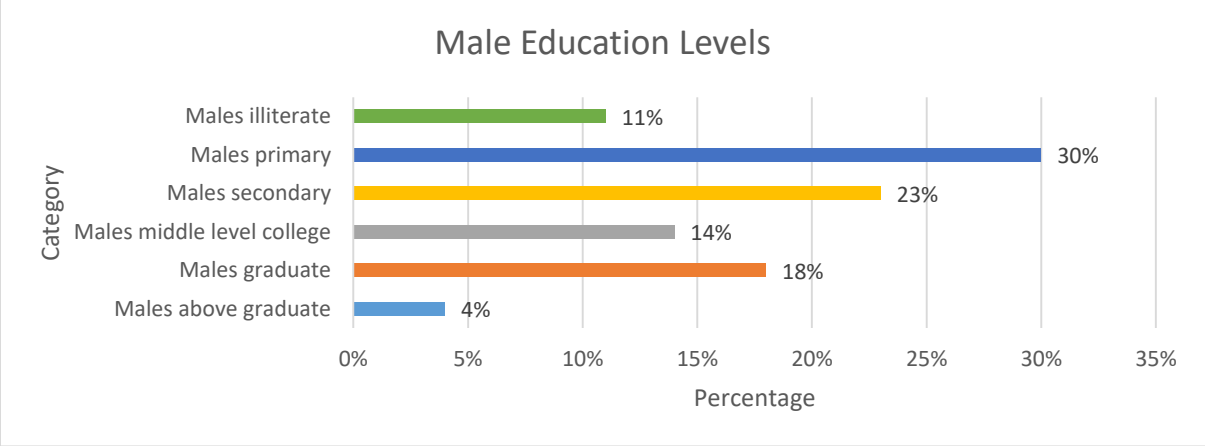

Figure 28: Male education level

4.2.11 Female Educational Level

25.3% of female respondents have attained secondary education. Female above graduate (8.4%), graduate (14.7%), middle level college (18.9%), primary (20%). Illiterate females acounted

for 12.7% of the respondents as shown in Figures 29 below. Illiterate respondents may require assistance during the implementation of the project. The analysis and the findings of the socio-economic survey should inform the involvement of the PAPs in the project execution/ works i.e. the skilled PAPs can be involved/ prioritised during construction workers' recruitment while unskilled PAPs can also be involved in construction works that conform with their abilities.

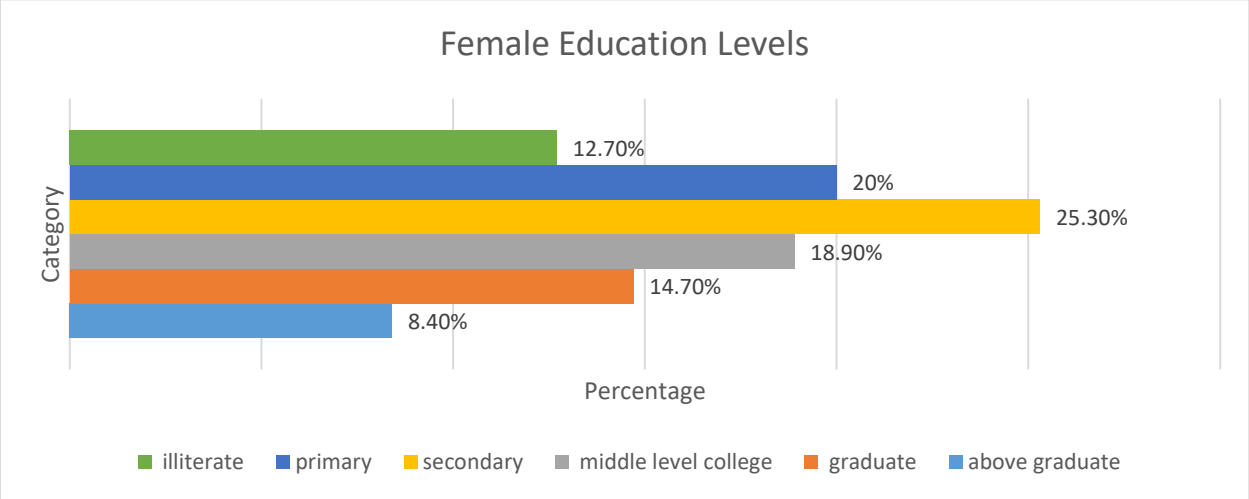

Figure 29: Female Education level of respondents

4.2.12 Employment status

Majority (93%) of the respondents are self-employed. The respondents are mainly involved in livestock keeping and small-scale businesses. Only 7% of the respondents who are salaried. The employment status of the respondents is provided in Figure 30 below. The self employed residents are involved in casual labor, farming and small businesses. Project work may provide an opportunity to improve businesses through improved infrastructure, increased customer base. Some may also be employed during project construction phase.

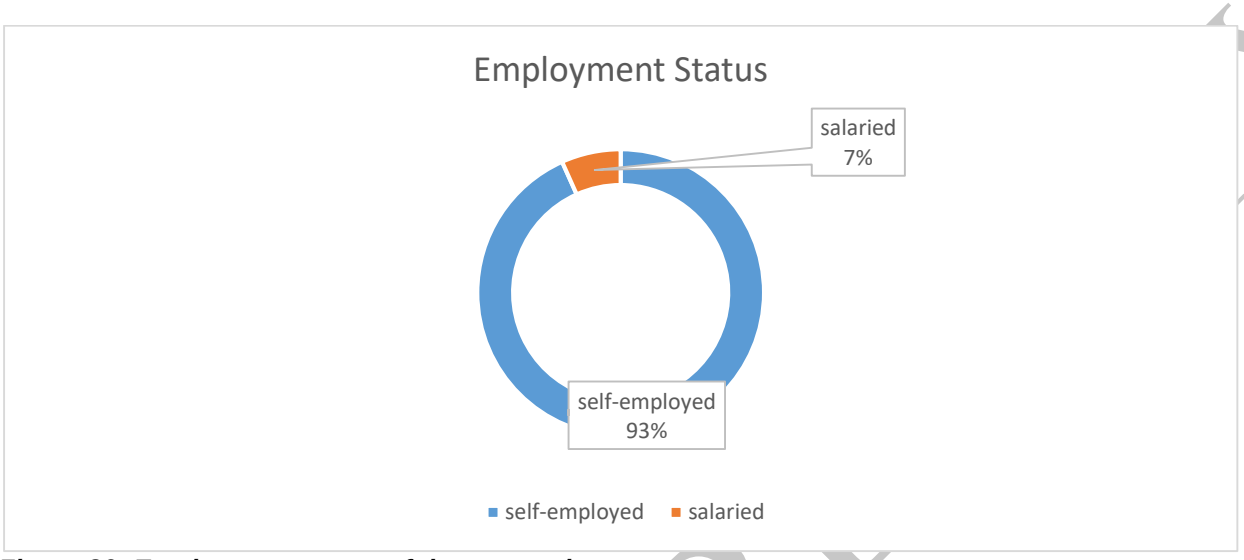

Figure 30: Employment status of the respondents

4.2.13 Monthly income

An estimated 12.77% of the respondent earn less than Kshs. 20,000 per month, 21.28% earn between 20,001- 40,000 while a similar number (21.28%) earn between 40,001- 60,000. Other incomes are distributed as follow; 60,001-80,000(8.5%), 80,001-100,000(6.38%), 100,001-120,000(4.26%). Those earning between 160,001-180,000, 180,001-200,000 and 200,001 and above each accounted for 2.13% respectively as shown I Figure 31 below. The improvement of infrastructures such as roads will boost trade in the area and this will improve income of the residents due to increased business opportunities.

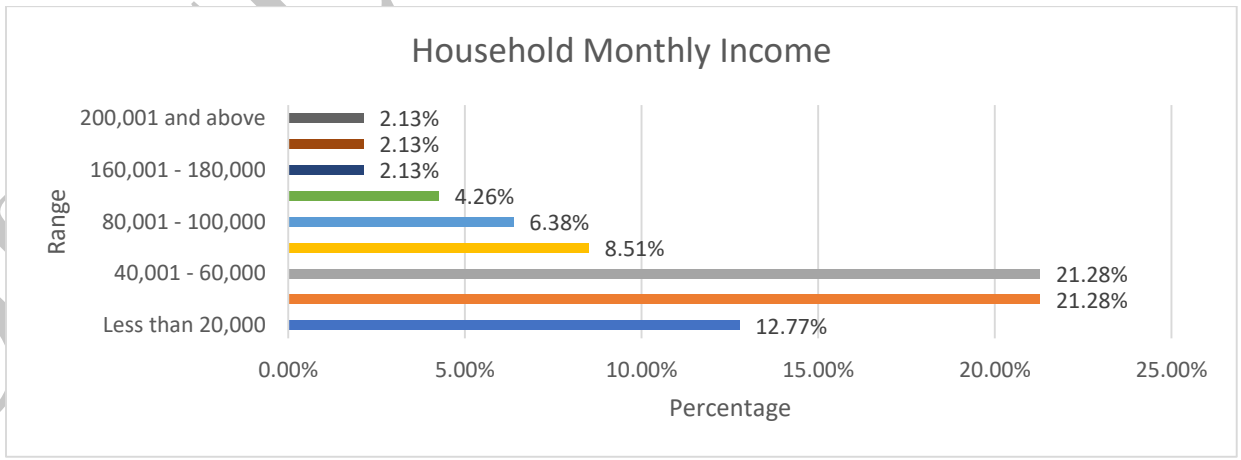

Figure 31: Monthly Household income

4.2.14 Household Expenditures

Most of the respondents fall within the low income bracket. The data collected from the respondent reveal that 20% of the respondents spend between less than Kshs. 10,000 per month while 19% spend 11,000- 20,000. Those who spend 21,000-30,000 accounted for 17%. A slightly high number (29%) of the respondents dspend between 31,000- 40,000. Also 10% spend 41,000-50,000. Those who spend 60,000 and above accounted for only 5% of the respondents. Alarge percentage of the household incomes are spent on food, clothing and education. The expenditure levels are provided in Figure. 32 below. The project will lead rise income that may also see the expenditure levels of the households within the project area go up.

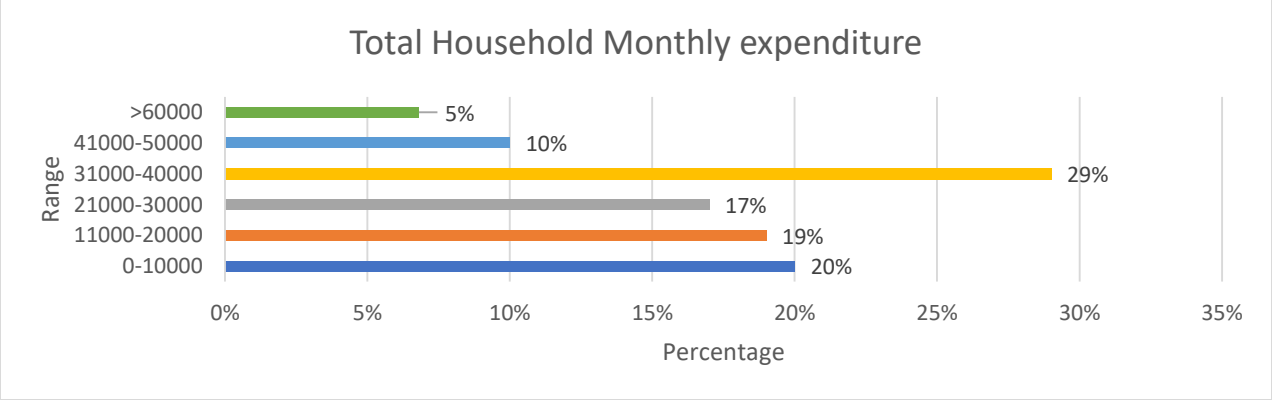

Figure 32: Monthly household expenditure of the respondents

4.2.15 Access to Electricity

Under energy, the electricity coverage in the County is 41.23% following connection of an additional 10,749 HHs to electricity within the last five years. The significant increase is attributed to the last mile connectivity project funded by the national government. Street lighting within the trading centres is at 85% contributing to more trading hours and a more secure business environment (Elgeyo Marakwet County Integrated Development Plan, 2023-2027). All the respondents have access to electric connectivity as shown in Figure 33 below.

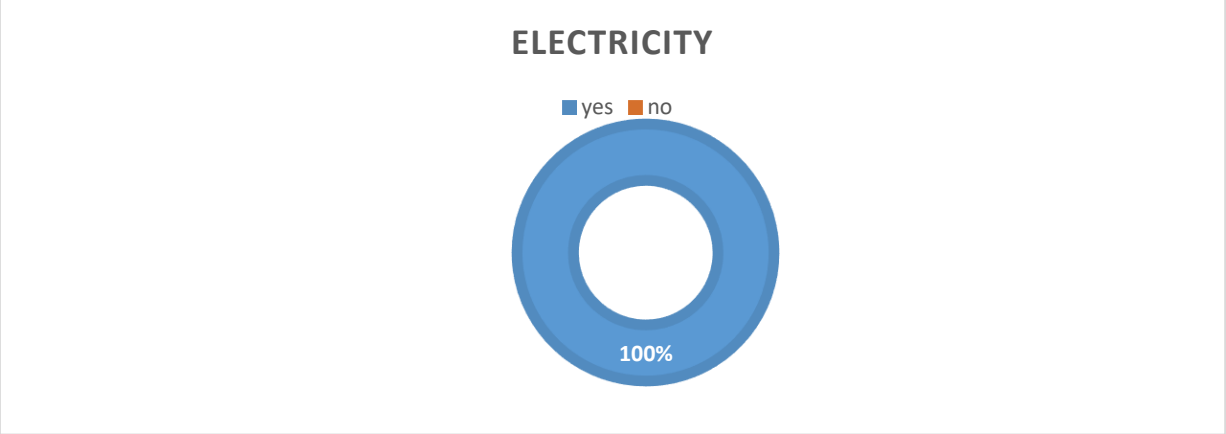

Figure 33: Access to Electricity and Connectivity

4.2.16 Access to Cooking Energy

Access to different sources of cooking energy vary across households. Majority of the respondents (35%) use kerosene. Equal number of respondents use charcoal and gas accounting for 23% each while 19% use firewood as presented in the Figure 34 below.

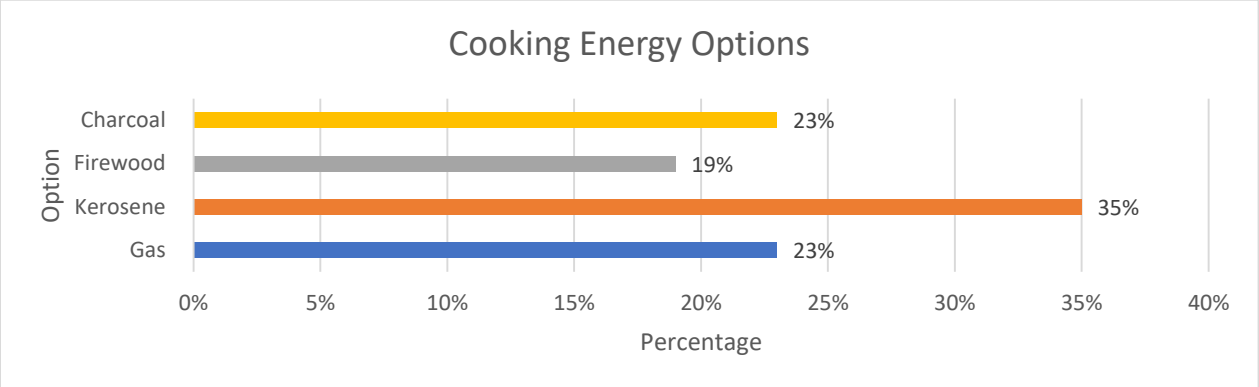

Figure 34: Cooking Energy

4.2.17 Access to clean Water for drinking

The proportion of households with access to clean and potable water in the County is 37.07% (Elgeyo Marakwet County Integrated Development Plan, 2023-2027). Most of the respondents (97%) get water from other sources such as springs and wells while only 3% of the respondents have access to tap water shown in Figure 35. Most of the respondents spend less than 1Km to get to the nearest water source. Provision of piped water will boost water supply within the settlement.

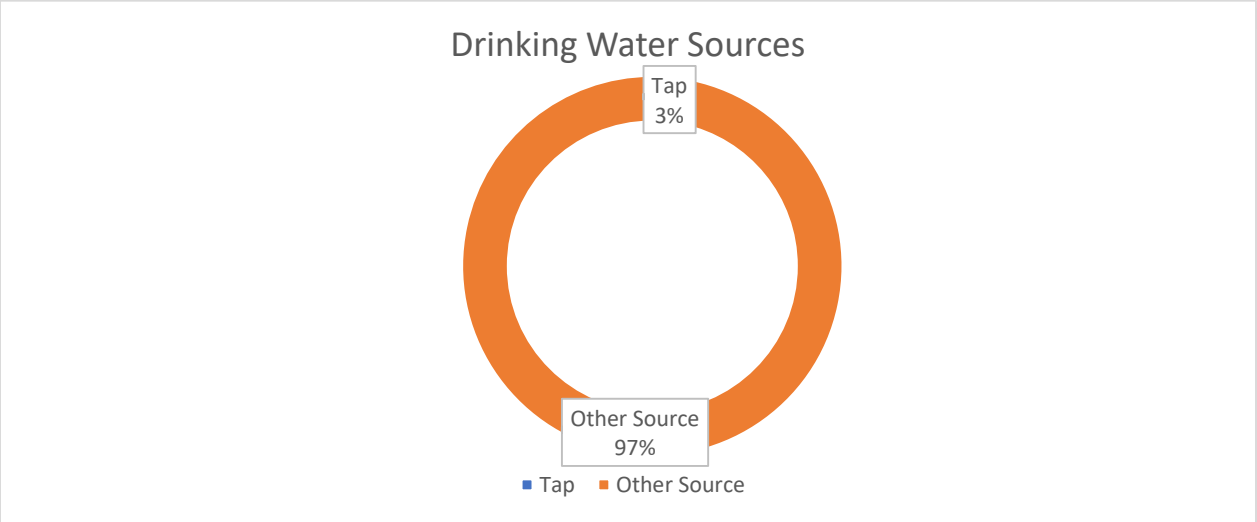

Figure 35: Access to clean Water for drinking

4.2.18 Housing Ownership

Housing is one of the basic requirements for growth and development of the economy. Majority (62%) of the respondents live in in their own houses while 38% live in rented houses as shown in Figure 36 below.

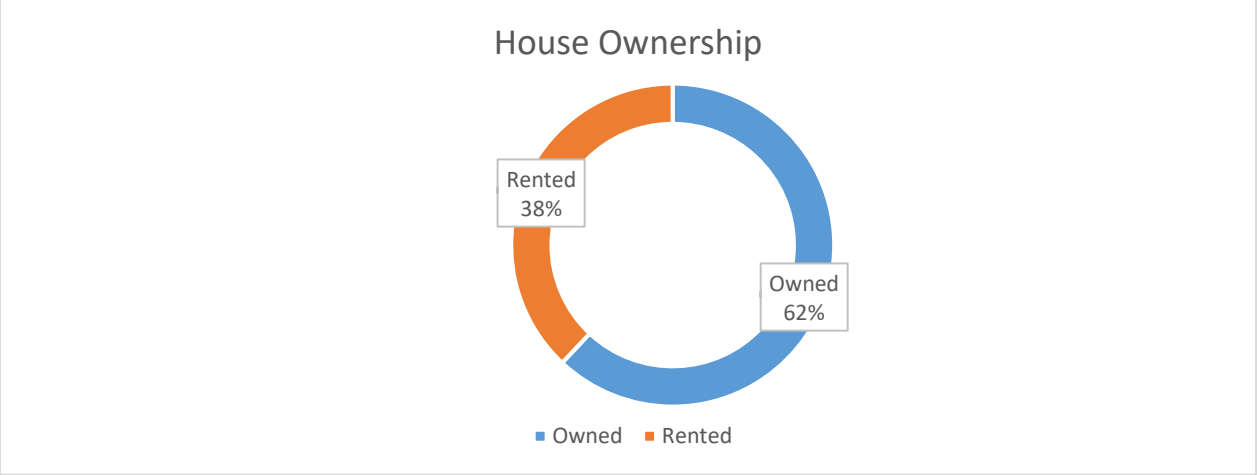

Figure 36: House ownership

4.2.19 Types of building materials

In Kenya, housing is classified in terms of roofing, walling and flooring materials. In the settlement, the main materials used for roofing are corrugated iron sheets used by (98%) of the respondents

while the preferred wall type is bricks used by 67 % of the respondents as shown in Figure 37 below.

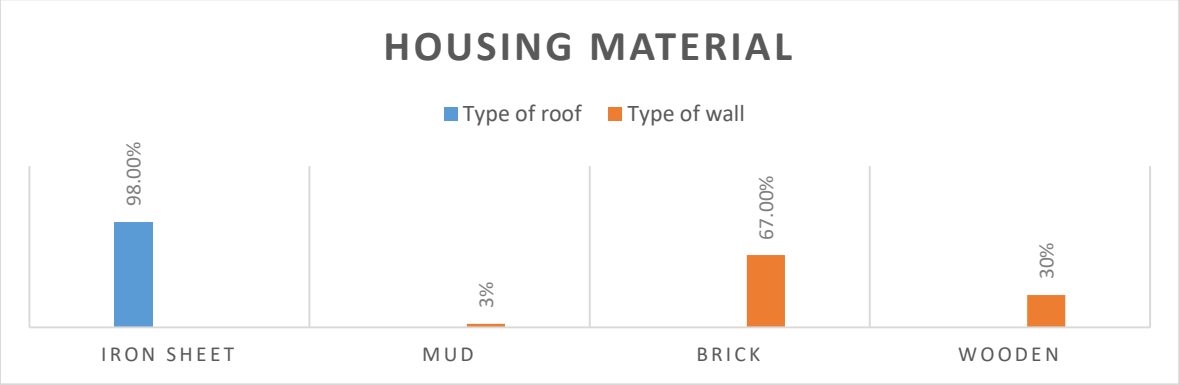

Figure 37:Type of wall and roofing material

4.2.20 Ownership of household assets

Most of the respondents own radio (24%), cooking gas (20%) and television (17.2%). The ownership of various assets by the respondents is shown in Figure 38 below.

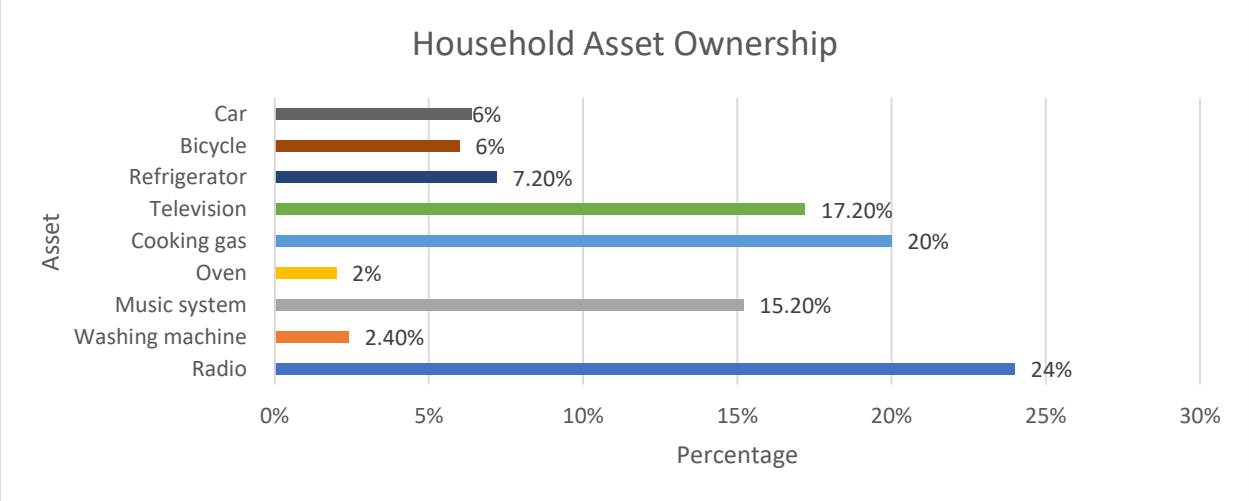

Figure 38: Ownership of household assets

4.2.21 Morbidity

Very few (2%) of the respondents reported having suffered chronic illnesses in the last one year. Morbidity is reported as very low because 98% of the respondents do not suffer from any chronic illness as indicated in Figure 39 below.

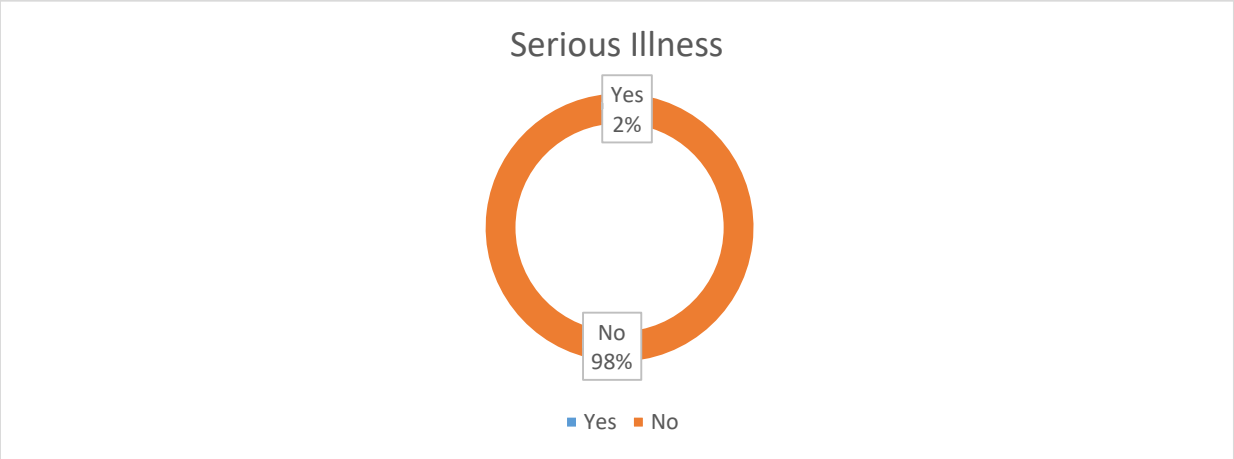

Figure 39: Morbidity

Very few (8%) of the respondents reported having suffered chronic illnesses in the last one year and the morbidity is reported as very low as indicated in Figure 40 below.

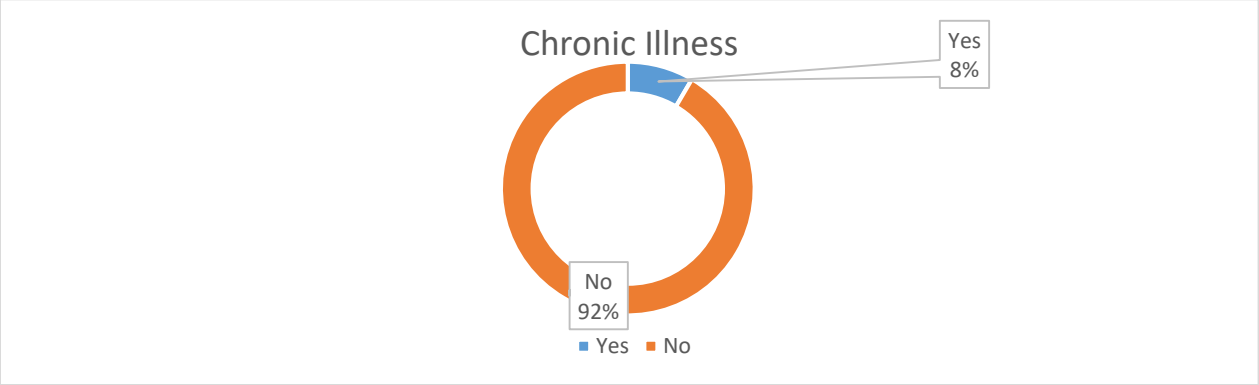

Figure 40: Chronic Diseases

4.2.22 Knowledge on HIV

Most of the respondents (80%) reported that they have knowledge about the spread of HIV. The respondents also said that they know how it spreads including unprotected sex (42%), blood transfusion (8%), contaminated syringe (11%), shaving razor (3%) and infected mother (36%). The prevention methods mentioned by the respondents includes use of condom (39%) and abstinence (61%) as shown in Figures 41 below.

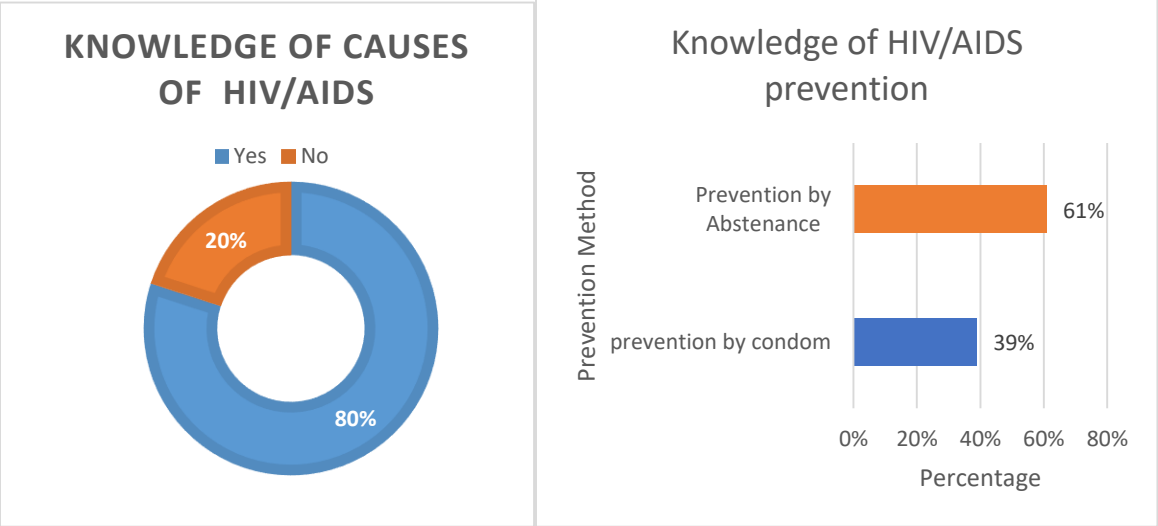

Figure 41: Knowledge of causes and prevention of HIV/AIDS

4.2.23 Gender Issues

More than half (54%) of the respondents indicated that women own land. At the same time, 46% of the respondents said that women own houses as shown in Figure 42 below.

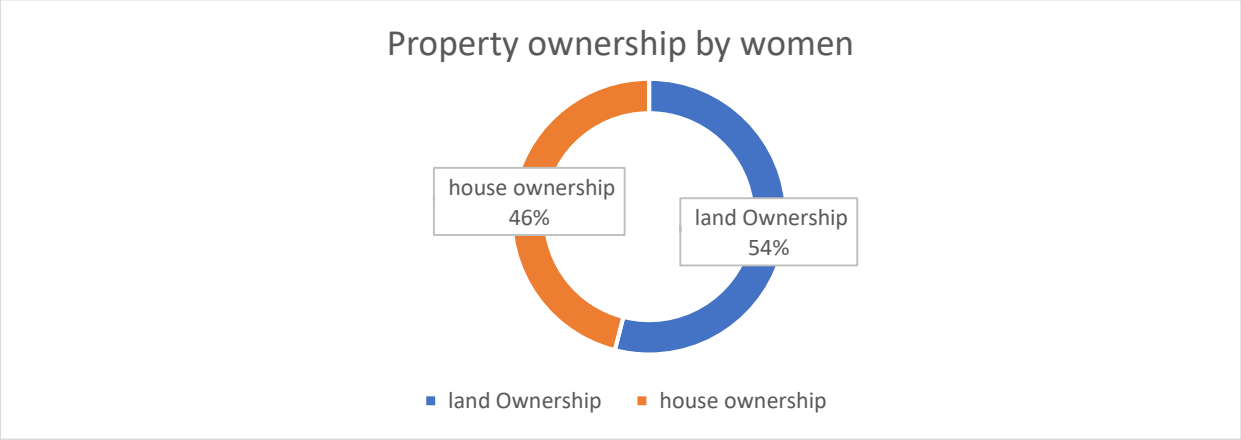

Figure 42: Property Ownership by women

Women in the settlements are faced with a number of challenges including inadequate access to credit, lack of technical skills, multiplicity of roles for women and inadequate access to education and training. The majority of the respondents also said that women are involved in decisions concerning household matters but were also quick to point out that men make final decision. The

involvement of women in decision-making was distributed as follows: financial matters (15%), education of children (14%), healthcare (15%), and purchase of assets (14%), day-to-day activities (15%), social functions (16%) and local governance 11%. KISIP 2 should ensure that women also benefit from the opportunities presented by the projects to be implemented.

The gender dynamics of the respondents is provided in Figure 43. The traditional delineation of labour persists with women assuming the entire responsibility for childcare, provision of food, water and firewood collection and the general maintenance of the homestead among others. Majority of the respondents said that women predominantly perform household chores.

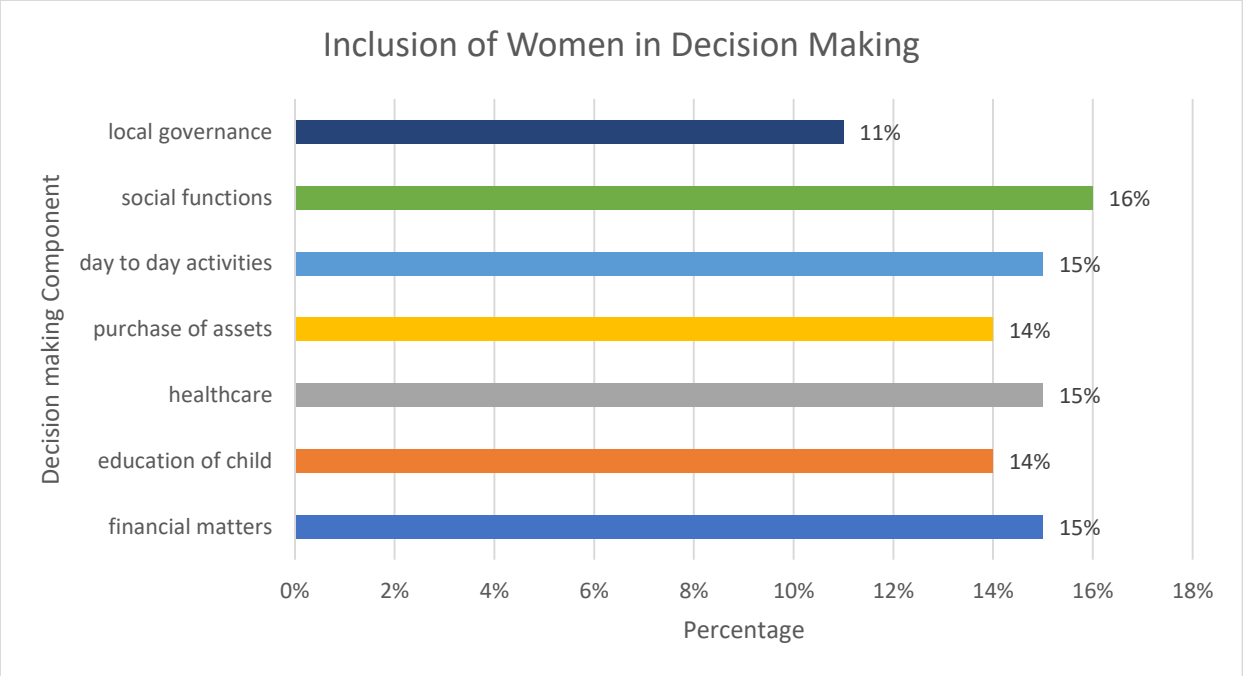

Figure 43: Gender and decision-making

CHAPTER FIVE

5. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORKS

5.1. Overview

This section provides details of the policy, legal and institutional frameworks relevant to the proposed project. Other relevant regulatory and legal framework specific to each Physical, Biodiversity or Social discipline are provided within each section of this report.

5.2. The Policy Framework

5.2.1. The Kenya Vision 2030

The objective of the Vision 2030 is to transform Kenya into a middle-income country with a consistent annual growth of 10 % by the year 2030. Chapter 5 of the Vision 2030 blueprint focuses on education, health, water, environment, housing and urbanization amongst other sectors. The 2030 goal for urban areas is to achieve "a well-housed population living in an environmentally secure urban environment." This is to be achieved by bringing basic infrastructure and services—roads, streetlights, water and sanitation facilities, storm water drains, footpaths, and others—to informal settlements.

Relevance: *KISIP 2 implementation directly contributes to achieving this goal of the Vision 2030 by the provision of basic infrastructure to the informal settlement.*

5.2.2. Sessional Paper No. 3 of 2009 on National Land Policy

This policy was formulated with the aim of securing rights over land and provision for sustainable growth, investment and reduction of poverty in line with Government overall development objectives. The policy offers a framework of policies and laws designed to ensure the maintenance of a system of land administration and management that will provide:

a) All citizens with opportunity to access and beneficially occupy and use land;
b) Economically viable, socially equitable and environmentally sustainable allocation and use of land;
c) Efficient, effective and economical operation of land markets;
d) Efficient and effective utilization of land and land-based resources; and

e) Efficient and transparent land dispute resolution mechanisms.

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

Following the first National Environment Action Plan (NEAP) in 1996, Sessional Paper No. 6 on environment and development was developed in 1999 to harmonize environmental and developmental goals to achieve sustainable development. It contained comprehensive strategies and appropriate guidelines for the government to act.

The key objectives of the Policy include: -

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

Under this paper, broad categories of development issues have been covered that require a "sustainable development" approach. These issues relate to waste management and human settlement. The policy recommends the need for enhanced reuse/recycling of residues including wastewater, use of low or non-waste technologies, increased public awareness and appreciation of a clean environment. It also encourages participation of stakeholders in the management of wastes within their localities.

Relevance: *KISIP 2 projects are aiming at improving the environment by enabling proper sanitation trough roads and drainages and the provision of ablution blocks for use by families in the informal settlement areas.*

5.2.4. National Water Policy 2021

The overall goal of the policy is to guide the achievement of sustainable management, development, and use of water resources in the country. The overall objective of the policy is to provide a framework that is dynamic, innovative, and effective for re-engineering the water sector.

Relevance: *The project design should take into account all environmental components and water resource conservation.*

5.2.5. Gender Policy

This policy spells out an approach of Gender mainstreaming and empowerment of women and clearly states that it is the right of women, men, girls and boys to participate in and benefit equally from the development process. It provides a framework for mainstreaming gender in all policies, planning and programming in Kenya and puts in place institutional mechanisms to ensure effective implementation. The need for a national policy arose from the government's realization that without a coherent and comprehensive overall framework for guiding gender mainstreaming within the different sectors and line ministries involved in development, enormous resources may continue to be misplaced.

Relevance: *In implementing KISIP II, The Client is hereby mandated to ensure compliance to the requirements of this policy during labour force mobilization*.

5.3. Regulatory Framework for Environmental Management in Kenya

5.3.1. The Constitution of Kenya, 2010

The Constitution of Kenya 2010 is the supreme law of the land. It lays the foundation on which the wellbeing of Kenya is founded. The constitution's provisions are specific to ensuring sustainable and productive management of land resources. Article 43 (1) states that;

Every person has the right—

(a) to the highest attainable standard of health, which includes the right to health care services, including reproductive health care;

(b) to accessible and adequate housing, and to reasonable standards of sanitation;

(c) to be free from hunger, and to have adequate food of acceptable quality;

(d) to clean and safe water in adequate quantities;

(e) to social security; and

(f) to education.

In Sections 69 and 70, the Constitution has inter alia identified National Obligations in respect of the environment and Enforcement of Environmental Rights respectively as follows: -

Section 69 (1): The State shall—

a) ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
b) work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;
c) protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
d) encourage public participation in the management, protection and conservation of the environment;
e) protect genetic resources and biological diversity;
f) establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
g) eliminate processes and activities that are likely to endanger the environment; and
h) utilize the environment and natural resources for the benefit of the people of Kenya.

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

Section 70 provides for enforcement of environmental rights thus: -

(1) If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.

(2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate—

(a) to prevent, stop or discontinue any act or omission that is harmful to the environment;
(b) to compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or

(c) to provide compensation for any victim of a violation of the right to a clean and healthy environment.

(3) For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.

Essentially, the New Constitution has embraced and provided further anchorage to the spirit and letter of EMCA 1999 whose requirements for environmental protection and management.

***Relevance**: The proposed project is geared towards ensuring that people living within densely populated settlements are able to access infrastructure and eventually quality services for the improvement of their living standards.*

5.3.2. The Environment Management and Co-ordination (Amendment) Act, 2015 and its sub regulations

EMCA Cap 387 is the principal law that governs the use, management and regulation of environmental resources in Kenya. Section 7 of the Act establishes NEMA as the authority to coordinate all environmental related activities in Kenya. The Act provides guidelines and recommendations in carrying out environmental assessment. In order to mitigate and control environmental damage from ongoing projects, Sections 68 and 69 of the Act require that all ongoing projects be subjected to annual environmental audits as further expounded in Regulation 35 (1) and (2) of Legal Notice 101 of June 2003. To operationalize EMCA 1999, a number of subsidiary legislation (Regulations) have been developed, key among them:

5.3.2.1. Environmental Management and Coordination (Water Quality) Regulations, 2006

The Regulations provides for sustainable management of water resources including prevention of water pollution and protection of water sources (lakes, rivers, streams, springs, wells and other water sources). It is an offense under Regulation No. 4 (2), for any person to throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution.

Regulation No. 11 further makes it an offense for any person to discharge or apply any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or permit the dumping

or discharge of such matter into the aquatic environment unless such discharge, poison, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards for effluent discharge into the environment. Regulation No. 14 (1) requires every licensed person generating and discharging effluent into the environment to carry out daily effluent discharge quality and quantity monitoring and to submit quarterly records of such monitoring to the Authority or its designated representatives.

The regulations provide details on management (handling, storage, transportation, treatment and disposal) of various waste streams including domestic, hazardous and toxic, pesticides, biomedical, and radioactive wastes.

Regulation No. 4 (1) makes it an offense for any person to dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.

Regulation 5 (1) provides categories of cleaner production methods that should be adopted by waste generators in order to minimize the amount of waste generated and they include: improvement of the production processes, monitoring the product cycle from beginning to end, and incorporating environmental concerns in the product design and disposal.

Relevance: *The construction and operational phases could impact on the surface water and thus will be guided by these regulations.*

5.3.2.2. Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control (Regulations) 2009

The Regulations control pollution from excessive noise and vibrations to protect human health. Part II section 3(I) of these Regulations 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. Part II Section 4 also states that: except as otherwise provided in these Regulations, no person shall (a) make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or (b) cause to be made excessive

vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source.

Part III, Section 11(1) states that any person wishing to (a) operate or repair any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air-conditioning apparatus or similar mechanical device; or (b) engage in any commercial or industrial activity, which is likely to emit noise or excessive vibrations shall carry out the activity or activities within the relevant levels prescribed in the First Schedule to the Regulations. Any person who contravenes this Regulation commits an offense. Section 13(1) states that no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or steam or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the Second Schedule to these Regulations. These purposes include emergencies, those of a domestic nature and /or public utility construction.

Relevance: *Implementation of KISIP 2 project should adhere to these requirements especially during the construction phase of the project.*

5.3.2.3. Environmental Management and Coordination (Air Quality) Regulations, 2014

Part II of the regulation prohibits any person through their activities to directly or indirectly cause immediate or subsequent air pollution by emitting any liquid, solid or gaseous substance in levels exceeding those set out in the First Schedule of the regulation.

Relevance: *Implementation of KISIP 2 project should adhere to these requirements especially during the construction phase of the project.*

5.3.2.4. Environmental Management and Co-ordination (Waste Management) Regulations, 2006

These Regulations were formulated to provide guidelines, procedures and standards for the environmental governance to ensure compliance. The Legal Notice No. 121, 2006 was enacted to regulate waste disposal activities within the country, Kenya. These Regulations define rules for the management of waste in general and for the management of solid waste, industrial waste, hazardous waste, pesticides and toxic substances, biomedical waste and radioactive substances.

Relevance: *Implementation of KISIP 2 project should adhere to the requirements prescribed in the regulations regarding waste management especially during the construction phase of the project.*

5.3.3. The Occupational Safety and Healthy Act, No. 15 of 2007 (Revised 2010)

This Act of Parliament was enacted to provide for the health, safety and welfare of persons employed in workplaces, and for matters incidental thereto and connected therewith. At every workplace where chemicals or other toxic substances are manipulated, the employer shall develop a suitable system for the safe collection, recycling and disposal of chemical wastes, obsolete chemicals and empty containers of chemicals to avoid the risks to safety, health of

Employees and to the environment. Under the Act, the employer as per section 6 has responsibilities among others to:

- Provide and maintain plant and systems and procedures of work that are safe and without risks to health
- Ensure safety and absence of risks to health in connection with the use, handling, storage and transport of articles and substances
- Provide information and training on safety and health
- Carry out appropriate risk assessments
- Take immediate steps to stop any operation or activity where there is an imminent and serious danger to safety and health

Relevance: *Implementation of KISIP 2 project should adhere to these requirements and ensure that all workers are protected in all phases of the project.*

5.3.4. Public Health Act Cap 242

This Act aims at achieving a clean environment free of any nuisance to promote public health and safety. This is applicable in this project, as a number of the proposed projects will directly and/or indirectly improve the health of the residents.

For the interpretation of the Act, Section 15 (IX) indicates that any noxious matter or wastewater discharged from any premises, such as a building constitutes a nuisance. The act also stresses

that no person shall cause a nuisance to exist on any land or premise occupied by him. Because of the above, the Act acknowledges that it shall be the duty of all local authorities (County Governments) to take all lawful measures for always maintaining their district in a clean and sanitary condition for remedy of any nuisance or condition liable to be injurious to health.

5.3.5. The Water Regulations, 2021

This Regulation implements the provisions of the Water Act, 2016 2016 concerning networks, facilities, equipment, applications and assets of all water resources. Part V and VI of the Act makes provisions for authorization of groundwater development and water quality, monitoring, waste disposal and effluent discharge data respectively.

Relevance: *Underground water sources are likely to be polluted by seepage of construction waste contaminants and drains-water from the building. Construction work also potentially uses a lot of water.*

5.3.6. Physical and Land Use Planning Act, 2019

The objects of the Act are to provide:

a) The principles, procedures and standards for the preparation and implementation of physical and land use development plans at the national, county, urban, rural and cities level;
b) The administration and management of physical and land use planning in Kenya;
c) The procedures and standards for development control and the regulation of physical planning and land use;
d) A framework for the co-ordination of physical and land use planning by county governments;
e) A mechanism for dispute resolution with respect to physical and land use planning;
f) A framework for equitable and sustainable use, planning and management of land;
g) The functions of and the relationship between planning authorities;
h) A robust, comprehensive and responsive system of physical and land use planning and regulation; and

a. a framework to ensure that investments in property benefit local communities and their economies.

The main principle among others to note for this project is that:

Relevance: *Development activities including the KISIP II projects will be planned in a manner that integrates economic, social and environmental needs of present and future generations.*

5.3.7. Kenya Roads Board (General) Rules 2022

The Kenya Roads Board was established in July, 2000 by the Kenya Roads Board Act, Act No. 7 of 1999 with the mandate to oversee, co-ordinate its development, rehabilitate and maintain the road networks in Kenya. The Board has the responsibility of managing revenues arising from the Roads Maintenance Levy Fund (RMLF).

The legal and institutional aspects of the new road sub-sector policy were subsequently incorporated in the Kenya Roads Act 2007 which provides for the establishment of three independent Road Authorities namely:

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

ii). Kenya Rural Roads Authority (KeRRA) responsible for rural and small town roads including class D, E roads and Special Purpose Roads.

iii). Kenya Urban Roads Authority (KURA) is significant to KISIP 2 as it takes charge of all City and Municipal Roads. This is the Authority that LAs will coordinate with in the design and implementation of investments targeting improvement of roads.

Legislations pertaining to land reservation and Ownership: The entire regime of laws relating to land has been explored under the Resettlement Policy Framework.

5.3.8. National Gender and Equality Commission Act 2011

The overarching goal for NGEC is to contribute to the reduction of gender inequalities and the discrimination against all; women, men, persons with disabilities, the youth, children, the elderly, minorities and marginalized communities.

Relevance: *This Act will be applicable for beneficiary groups and in workforce-related activities in the KISIP 2 sites.*

5.3.9. Public Procurement and Disposal Act 2022

An ACT of Parliament to give effect to Article 227 of The Constitution; to provide procedures for efficient public procurement and for assets disposal by public entities; and for connected purposes ENACTED by Parliament of Kenya. The objectives of public procurement include improving efficiency, competition, and accountability. There are six main types of objectives: price, quality, timeliness, sustainability, proportionality, and neutrality.

Relevance: *All procurement under KISIP 2 will be subject to this statute.*

5.3.10. Land Act, 2012

It is the substantive law governing land in Kenya and provides legal regime over administration of public and private lands. It also provides for the acquisition of land for public benefit. The government has the powers under this Act to acquire land for projects, which are intended to benefit the general public.

This Act provides for the procedure to be followed during compulsory acquisition of land by the Government and the just compensation, which should be paid promptly, and in full to all persons whose interest in land has been affected.

An abbreviated Resettlement Action Plan was undertaken to establish whether there are any displacements along the proposed project locations and the findings captured in the ARAP report on Annex III of this report.

5.3.11. HIV and AIDS Prevention and Control Act 2006 (Revised 2012)

The object and purpose of this Act is to (a) promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS; (b) extend to every person suspected or known to be infected with HIV and AIDS full protection of his human rights and civil liberties. The Act provisions will be applied during the Project implementation

phase where the contractor will be required to create awareness on prevention and management among workers and community at large.

5.3.12. The Urban Areas and Cities (Amendment) Act 2019

In classifying an area as a city, municipality or town, regard shall be had to the ability to provide the following services and the existence of the services required to be provided by the National Government.

legal basis for classification of urban areas (City) when the population is at least 250,000; a municipality when it is at least 50,000; and a town when the population is at least 10,000 and a market center when the population is at least 2,000.

Relevance: *With the growing population, there will be need for more resources and infrastructure in line with the population of the area. This act will guide future KISIP projects in terms of prioritization.*

5.3.13. Physical Planning Act 1996 (286) (Revised) in 2012

Section 33 of the Act states that no person shall carry out development within the area of a local authority without a development permission granted by the local authority under section 33.

Section 36 also states that if in connection with a development application a local authority is of the opinion that proposals for industrial location, dumping sites, sewerage treatment, quarries or any other development activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an environmental impact assessment report

Relevance*: Relevant approvals and permits should be obtained within the relevant County Government jurisdictions to ensure that the project implementation is flawless. This Environmental Impact Assessment report is also undertaken to satisfy this requirement especially for material sites for the road construction project.*

5.3.14. Data Protection Act, 2019

An Act of Parliament to give effect to Article 31(c) and (d) of the Constitution; to establish the Office of the Data Protection Commissioner; to make provision for the regulation of the processing of personal data; to provide for the rights of data subjects and obligations of data controllers and processors; and for connected purposes.

The Act expressly prohibits the processing of personal data of a data subject where their consent has not been obtained. It is upon the data controller and/or data processor to prove that they obtained the consent of the data subject before processing their personal data.

All information obtained from the KISIP II consulted parties is confidential and only used for the purposes of this report. Consent will be obtained to process al the required data from them.

5.3.15. Sexual Offences Act, 2006

An Act of Parliament that makes provision about sexual offences aims at prevention and the protection of all persons from harm from unlawful sexual acts and for connected purposes. Section 15, 17 and 18 focuses mainly on sexual offenses on minors (children).

Relevance: *Protection of vulnerable individuals including children by providing confidentiality and Privacy of reported cases of Sexual Harassment (SH) and Sexual Assault (SA) in the project's duration.*

5.3.16. Labour Relations Act, 2007 (Revised) 2012

An Act of Parliament to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations or federations, to promote sound labour relations through the protection and promotion of freedom of association. This act will be applied by the labour force on site in addressing disputes related to working conditions.

5.3.17. The Children Act, 2022

Part II Section 18 of the Act indicates that (1) No person shall subject a child-to-child labour, domestic servitude, economic exploitation or any work or employment which is hazardous,

interferes with the child's education or is likely to be harmful to the child's health or physical, mental, moral or social development where a child is any individual who has not attained the age of eighteen years.

Relevance: *This Act prohibits child labour, sexual harassment among other vices during construction and all other phases of the project.*

5.3.18. County Government Act No. 17 of 2012

The preamble to the Act gives an overriding object and purpose of the Act. It states that, 'An Act of Parliament to give effect to Chapter Eleven of the Constitution; to provide for county governments' powers, functions and responsibilities to deliver services and for connected purposes. Part II elaborate on the functions and powers of the county government, emphasizing its constitutional authority to enter into contracts, acquire and hold and dispose of assets, and delegate functions, such as through sub-contracts and partnerships. Part VI considers the focus and administration of decentralization to the sub-county level, including to urban areas and cities.

Part VIII focuses on Citizen Participation stating that "citizen participation in county governments shall be based upon reasonable access to the process of formulating and implementing policies, laws, and regulations, including the approval of development proposals, projects and budgets, the granting of permits and the establishment of specific performance standards" (87(b)); and "promotion of public private partnerships, such as joint committees, technical teams, and citizen commissions, to encourage direct dialogue and concerted action on sustainable development" (87(f)).

On the aspect of public communication and access to information, the county governments are vested to "undertake advocacy on core development issues such as agriculture, education, health, security, economics, and sustainable environment among others" (94(c)).

The County Government Act, 2012, provides the basis for spatial plans as statutory requirements in the county. The Act stipulates a 10-year spatial plan be developed by each county to provide for:-

(a) Spatial depiction of the social and economic development programme of the county as articulated in the integrated county development plan;

(b) A clear statement of how the spatial plan is linked to the regional, national and other county plans; and

(c) A clear clarification on the anticipated sustainable development outcomes of the spatial plan.

Relevance: *The KISIP 2 project should adhere to the requirements of this Act in ensuring that the proposed project is in line with the current county government spatial plans.*

5.3.19. Legislations Relating to Physical Cultural Property

The administration of Kenya's cultural heritage is informed by the Kenya National Policy on Culture and Heritage (NPCH) and by the provisions of articles 11, 40, and 69 of the Kenya Constitution (Republic of Kenya 2010). At the practical level, the National Museums and Heritage Act, Cap 216 and less importantly both the Environmental Management and Co-ordination Act, Cap 387 and the Land Act 2012 operationalize the management of Kenya's cultural heritage. Others include Cap 19 (the Public Archives and Documentation Service Act of 1991) and Cap 509 (Kenya's Industrial Property Act of 2001).

The National Museums and Heritage Act, (Cap 216), mandates the National Museums of Kenya as the institution to protect, preserve, and control the use of Cultural Heritage in the country. The Act repealed the then Antiquities and Monuments Act cap 215. The Act provides for the control, establishment, development and management of national museums and the protection, identification, transmission and conservation of the natural and cultural heritage of Kenya.

Under the Act, an object or area of cultural, historical, or scientific significance, can be declared as protected. In accordance with Cap 216, archaeological sites may not be destroyed, excavated or altered without an exploration/excavation permit issued by the cabinet secretary or designate.

A chance find of previously unknown heritage resources e.g. graves, shrines, archaeological sites, etc. encountered during project construction or operation will be managed according to a Chance Find Procedure. The Chance Find Procedure is a process that prevents chance finds from being disturbed until an assessment by a competent specialist is made and actions

consistent with the requirements are implemented. This procedure will be applicable to all activities conducted by project personnel, including contractors, that have the potential to uncover a heritage item/site. The procedure details the actions to be taken, the roles and responsibilities, and the response times required from both project staff, and any relevant heritage authority.

The Environmental Management and Coordination Act, requires project proponents to undertake Environmental Impact Assessment (EIAs) for proposed projects. For projects, with potential impact on cultural and heritage sites, a cultural and heritage impact assessment is required as part of the EIA.

Relevance: *KISIP 2 projects must take history and cultural heritage into consideration while locating and implementing projects. Upon screening, no cultural heritage site was identified along the project areas. See screening checklist on Annex IV and V of this report.*

5.3.20. Public Participation Act, 2018

5.3.21. Climate Change (Amendment) Act, 2023

The Acts provides for development, management, implementation and regulation. of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya. All projects are required to mainstream climate change responses into development planning, decision making and implementation among others.

Relevance: *The release of greenhouse gases from construction vehicles during construction and material sourcing may impact the microclimate along the construction area. The design of the roads, drainages and lights should be climate resilient*

5.3.22. Elgeyo Marakwet County Climate Change Act 2021

The act requires climate resilient projects to be undertaken

5.4. Relevant International & Regional Conventions

Kenya is a signatory to several international instruments on environmental management. These are summarized in Table 13 below:

Table 13: Relevant International and Regional Conventions

Convention	Objective	Relevance to KISIP
Sustainable Development Goals	The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. Relevant SDGs: SDG 1: No poverty SDG 6: Clean water and sanitation SDG 11: Sustainable cities and communities SDG 13: Climate action	**SDG 1**: No Poverty: The construction project can create job opportunities for residents, helping to alleviate poverty and improve livelihoods within the informal settlement **SDG 6:** Clean Water and Sanitation: The project can provide access to clean and safe water sources, as well as upgraded sanitation facilities, thereby improving hygiene and reducing waterborne diseases **SDG 11:** Sustainable Cities and Communities: By improving infrastructure and housing, the project can contribute to the development of more sustainable and resilient communities within the informal settlement **SDG 13:** Climate Action: The construction project can incorporate climate-resilient design elements and technologies that mitigate the impact of climate change on the informal settlement
The African Convention on the Conservation of Nature (1968)	To encourage individual and joint action for the conservation, utilization and development of soil, water, flora and fauna for the present and future welfare of mankind, from an economic, nutritional, scientific, educational, cultural and aesthetic point of view.	KISIP II environmental assessments will assess the development with regards to utilization of natural resources and environmental conservations
The Ramsar Convention (1971) on wetlands of International Importance	To stop the progressive encroachment on and loss of wetland now and in the future, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific and recreational values.	KISIP II environmental assessments will assess the development with regards nearby ecological functions. Including rivers and streams among others

The Protection of World and Cultural Heritage convention (1972)	To establish an effective system of collective protection of the cultural and natural heritage of outstanding universal values.	KISIP II environmental assessments will assess the development with regards the existing cultural heritage sites. The screening exercise noted that there were no cultural sites along the proposed project corridors
The Vienna Convention for the protection of the Ozone Layer (1985)	To protect human health and the environment against adverse effects resulting from modification of the ozone layer	KISIP II environmental assessments will assess the development with regards to climate change factors
Montreal Protocol on Substances that deplete the Ozone layer (1987)	To protect the ozone layer by taking precautionary measures to control global emissions of substances that depletes it.	KISIP II environmental assessments will assess the development with regards to assessment of air pollution by undertaking baseline screening measurements
The Basel Convention on the trans-boundary Movement of Hazardous Wastes and their disposal	To reduce trans-boundary movements of waste subject to a minimum consistent to the environmentally sound and different effects of such wastes and to minimizing the amount and toxicity of hazardous wastes generated and ensuring their environmentally sound management	KISIP II environmental assessments will assess the development with regards types of wastes that are likely to be generated and their mitigation measures
Convention on Biological Diversity- (CBD 1992)	To promote diversity and sustainable use and encourage equitable sharing of benefits arising out of the utilization of genetic resources	KISIP II environmental assessments will assess the development with regards to biodiversity and sustainability
United Nations Framework Convention on Climate Change (UNFCCC, 1992) and the Paris Climate Agreement 2016	An international Treaty adopted in 1992 that came into force in 1994. The objective of UNFCCC is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Paris Climate Agreement 2016, operationalizes UNFCCC whose long term goal is to keep the increase in global temperatures to well below 2 degrees above pre-industrial levels, and to pursue efforts to limit the increase to 1.5 degrees, to substantially reduce impacts of climate change.	KISIP II environmental assessments will assess the development with regards to climate change

5.5. World Bank's Safeguard Policies

The World Bank's Safeguard policies are designed to help ensure that projects proposed for Bank financing are environmentally and socially sustainable. These operational policies are as shown in Table 14 below:

Table 14: Triggering of World Bank Safeguard Policies Policy

Operational Policy	Triggered	Discussion
OP 4.01: Environmental Assessment	Yes	The project triggers the Environmental Assessment safeguard. The project is assigned Category B, based on the results of the screening of the potential project activities.
OP 4.12: Involuntary Resettlement	Yes	Both integrated planning for tenure security and infrastructure upgrading interventions have potential for involuntary resettlement. A standalone document to guide the process of involuntary resettlement and compensation (Resettlement Policy Framework) is prepared and publicly disclosed.

(i) Environmental Assessment (OP 4.01)

OP 4.01 requires Environmental Assessment (EA) for projects proposed for Bank financing to ensure that they are environmentally sound and sustainable, and as a basis for decision making. Under OP 4.01 projects are screened and assigned either of four categories each of which requires different levels of environmental assessment as follows:-

- Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.
- Category B: A proposed project is classified as Category B if it's potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than

for Category A projects.

- Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

- Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary in subprojects that may result in adverse environmental impacts.

The KISIP 2 has been classified as environmental category B and under an Environmental and this Environmental Impact Assessment report has been prepared in compliance with OP 4.01.

5.5.1. World Bank Environmental and Social Policy for Investment Project Financing

The Bank classifies project into one of four classifications: High Risk, Substantial Risk, Moderate Risk or Low Risk and thus will be done in accordance with the national law. (World Bank ESF 2018) Screening for KISIP 2 project was undertaken and the checklist presented in Annex IV and V for the social and environmental screening respectively. The screening undertaken indicates that the proposed projects are likely to have minimal or no adverse environmental or social risks and impacts and do not require further environmental and social assessment following the initial screening and therefore classified as moderate risk.

5.6. Project Governance and Administrative Structure

The following Table 15 below presents a list of administrative agencies and government institutions that regulate the development of the project.

Table 15: Project Governance and Administrative Structure

Institution	Description
Donor	Responsible in financing the project and technical assistance
National Level	
Project Steering Committee:	Responsible for Strategic guidance and in consultation with World Bank, provides approval of Annual Work Plans and Budgets

Institution	Description
National Project Coordination Team	Responsible for the overall coordination of Project activities. NPCT is in charge of Project design, financial management, procurement, M&E, reporting, capacity building and communication. Further, it supports the participating counties to ensure adherence to IDA's applicable policies and guidelines. The national level works in liaison with the Council of Governors (CoG) to ensure effective coordination and communication with the participating County Governments.
County Level	
County Project Coordination Team	Responsible for implementing Project activities within respective counties and supervising the day-to-day project activities.
Community Level	
Settlement Executive Committee (SEC)	Established in each participating settlement. Responsible for community mobilization, awareness creation and ensuring community participation on Project activities.
Grievance Redress Committee (GRC)	Responsible for receiving and registering grievances/ complaints, investigating and giving resolutions. Cases that are not resolved are escalated to CPCT, then to NPCT and WB GRS. Complainants are also at liberty to seek redress at the court of law.

5.7. List of required permits

Table 16: List of required permits

Permit/License requirement	**Issuing Body**	**Legal requirement**
Construction permit	County Government	Physical Planning Act 1996 (286) (Revised) in 2012
Effluent discharge license	NEMA	Environmental Management and Co-ordination Amendment Act (2015
ESIA license	NEMA	Environmental Management and Co-ordination Amendment Act (2015
Waste handlers license/permits	NEMA/ County government	Environmental Management and Co-ordination Amendment Act (2015
Water abstraction permit	WRA	Environmental Management and Co-ordination Amendment Act (2015 and Water Act, 2016.
Noise permit	County Government	Environmental Management and Co-ordination Amendment Act (2015
Development plan permits	County Government	Physical land use planning Act (2019)
Workplace registration permit	County Government	DOSHS draws its functions from the Occupational Safety and Health Act (OSHA), 2007 and the Work Injury Benefit Act, 2007
Material transportation permit	County Government	Traffic Act Cap 403 part (V) and (VI); Kenya Roads Act No.2 of 2007

CHAPTER SIX

6. PUBLIC AND STAKEHOLDER CONSULTATION

The stakeholder and the community consultation process was conducted in compliance with the Kenyan Regulatory requirements set out in the Environmental Management and Coordination Act 1999 and the Environment Management and Coordination (Amendment) Act, 2015.

The main objective of the community and stakeholder consultation is to disseminate project information and to incorporate the views of the Project Affected Persons (PAPs) in the design of the mitigation measures and preparation of environmental and social management plans.

The specific objectives of the stakeholder and public consultation process include:

- Introduce the proposed project to stakeholders;
- Allow the stakeholders to provide comments and raise issues and concerns regarding the project;
- Gather and document communities' concerns about the project and the screening process;
- Obtain opinions and suggestions directly from the stakeholders on their preferred mitigation measures;
- Assist in building and strengthening relationships with the community and stakeholders;
- Identify local leaders with whom further dialogue can be continued in subsequent stages of the project.

6.1. Identification and analysis of stakeholders

The various local and international standards being applied to this Project define two main categories of stakeholders; differentiating, for example, between "those who will be or are likely to be directly or indirectly affected, positively or negatively, by a project (commonly referred to as project affected people, households or communities)" and "those who might have an interest in, or may influence the project" Following these definitions, the two principal groups of stakeholders in the Project are broadly categorized as follows.

Affected Parties: People/entities directly affected by the Project and/or have been identified as potentially vulnerable to change and who need to be engaged in identifying impacts and their

significance, as well as in decision-making on mitigation and management measures. Affected parties are those generally located within the Project's defined area of influence.

Directly affected: Communities, groups and individuals displaced physically and/or economically by the Project, including any vulnerable persons; and

Indirectly Affected: Residents, businesses, officials and administrators in the project area who may be indirectly affected by employment opportunities, influx and the related pressure on resources and services; local community-based groups who represent affected groups and/or other affected parties; and employees, their representatives and contractors.

Interested Parties: These are people/entities interested in the Project and/or could affect the Project in some way. Interested parties include National and international CSOs, non-governmental organizations (NGOs), community-based organizations (CBOs) and faith-based Organizations.

The various stakeholders in the project are analyzed in the table 17 below.

Table 17: Stakeholder identification and Analysis

Stakeholder groups	Key stakeholders	Current engagement How they are involved in the project activities	How could the stakeholder contribute to the project?	Level of Influence	Level of Interest	Engagement Technique
National government agencies (Lead agencies mandated to review and advise on the project's development, including)	Ministry of roads, transport infrastructure	Coordinate the project at national level	Coordinates project funds with the donor and treasury	High	High	Collaborate
	National Environment Management Authority (NEMA)	Ensure that the project is in compliance with National Environmental laws	Approval of project environmental related documents	High	Low	Consult
	Kenya Rural Roads Authority (KERRA)	Deals with Rural roads	Road improvement in project area	Low	High	Involve
	Kenya Urban Roads Authority (KURA)	Deals with urban Roads	Improvement of roads in urban area	Low	High	Involve
	Water Resource Management Authority (WRM)	Deals with water resources management	Protection of water catchment areas and wetlands within the project area	Low	High	Involve
	Kenya Power and Lighting company (KPLC)	Deals with electric power transmission	Deals with electric power transmission	Low	High	Involve
	ICT- Authority			Low	High	Involve
	Ministry of Interior and coordination of national government functions	Provide security and shall also coordinate and supervise the project on behalf of the National government	Provide security Provide security to project team and support project implementation through local administrators such as chiefs	High	High	Collaborate
	Social, Gender, and Youth Development	Support the different groups, which shall be formed during the various phases of the project.	Support the different groups, which shall be formed during the various phases of the project.	Low	High	Involve

Stakeholder groups	Key stakeholders	Current engagement How they are involved in the project activities	How could the stakeholder contribute to the project?	Level of Influence	Level of Interest	Engagement Technique
	Ministry of Agriculture	Advise on to compensate crops which shall be affected by the project	Advise on to compensate crops which shall be affected by the project	Low	High	Involve
Local County Government Of Elgeyo Marakwet	Governors, CEC roads Environment, agriculture and lands	Support Counties to mobilize people and share project information with the members of the public	Support Counties to mobilize people and share project information with the members of the public	Low	High	Involve
Leaders	MCAs Members of the National assembly			High	Low	Consult
Affected communities	Local populations	Affected communities: settlements affected both by Project impacts and benefits.	Can be mobilized to support the project	Low	High	Involve
	Youths			Low	High	Involve
	Vulnerable groups	Affected communities: settlements affected both by Project impacts and benefits.	Can be mobilized to support the project	Low	Low	Inform
	Bodaboda associations			Low	High	Involve
	Businesses, utilities and other infrastructure Owners	Businesses that will experience both Project impacts and benefits. Impacts include loss of land, assets or revenue,	Can be mobilized to support the project	Low	High	Involve

Stakeholder groups	Key stakeholders	Current engagement How they are involved in the project activities	How could the stakeholder contribute to the project?	Level of Influence	Level of Interest	Engagement Technique
	Affected businesses, Chamber of commerce Bodaboda groups with Shades on road reserve	including roadside market stall owners, and formal and informal businesses affected by land acquisition. Benefits include reduced travel time, increased economic opportunities and easier access to customers and markets				
Civil Society Organizations	NGOs and local associations, religious organizations	Keen on defending the rights of the local communities but may also help the PEA to mobilize local support for the project	Keen on defending the rights of the local communities but may also help the PEA to mobilize local support for the project	Low	High	Involve
International	Project financiers World Bank	Organizations providing finance for the development of the project	Organizations providing finance for the development of the project	High	High	Collaborate
Press and media	Local and national press and media	Press and general media groups have the role of informing the general public about the Project's impacts and benefits	Press and general media groups have the role of informing the general public about the Project's impacts and benefits	Low	Low	Informed

6.2. Consultation Approach

Stakeholder identification was done through a social scan; key county officials who are able to influence the outcome of the project as well as all the affected communities. The communities formed Settlement Executive Committees (SECs) who provide an interface between the communities and the project. The SEC members through the project teams and local area leadership were able to mobilize community members for the successful community participation in during consultations.

6.3. Consultation Methods

The consultation methods used to engage the stakeholders in the specific projects included:

6.3.1. One- to-one meetings with Key Informants

The team of experts who visited the key informants in their respective offices undertook this. Their comments were captured in questionnaires and other taken note of for inclusion in the report. All information was obtained and presented with consent of the stakeholders.

6.3.1.1. Key stakeholder consultations outcomes

Key informant interviews were held within the month of November between 20th and 23rd the year 2023. The relevant government officers were visited in their offices and comments were noted with several Sub- County water officers and heads within Elgeyo Marakwet County. Table 18 below presents the feedback of the key stakeholders consulted.

Table 18: Key Stakeholders feedback

Designation/ Department	Question	Comment	Recommendation
Town Administrator	Main land tenure system	The systems are; private, trust land and alienated government land.	Grievance redress committee to handle emerging issues during project implementation
	Current state of land ownership in the settlements.	Public land	Residents ready for the development agenda to improve their living standards.
	Land adjudication	Adjudicated and titled.	Yes

	How one gets to know actual land owner in absence of Title Deeds.	Community resource persons like elders take lead basing on history to identify the owner of land parcel.	Should done in away so that conflicts may not arise.
	Challenges and good cases in land take for public purposes.	Public utilities have been put up. Lack of infrastructural facilities on the land. Land grabbing	Mapping and proper documentation of public land. Beaconing of all land belonging to the public.
	Grievance and conflict resolution mechanism being practiced in the project area.	Existence of grievance redress committees. Nyumba-kumi initiatives. Chief`s dispute resolutions. Customary dispute resolutions.	This will aid in settling conflicts that may arise from project implementation phase.
Environmental Officer	Main water sources around project areas.	Piped water from water supply company, boreholes, streams, rivers and rainwater. There is also a water catchment area (cherenganyi forest) hosting both indigenous and exotic trees within project areas.	Most available water sources are unreliable and therefore need for greater improvements. There`s need for continuity in conserving our water catchment areas to counter the effects of climate change.
	General water quality in project areas.	Clean and safe water for domestic use and irrigation.	Due to high population in this settlements, there`s need to increase water points to sustain the whole community.
	Water accessibility to local communities	Community access water supply from water companies at a fee. Residents also harvest rainwater during rainy seasons and store it in storage tanks for use. Rivers and streams also surround the area, which boosts water supply for both domestic and farming activities.	There`s need for a reliable source of water

	Waste water disposal	Most wastewater is disposed into pit latrines, channeled to water sources and others use it for irrigation purposes.	The residents proposed to have wastewater disposal site in and Cheptongei.
	Solid waste management	Collection pits in homesteads and burning. Collection points and later collected by county government trucks for disposal. Collecting and composting.	Both Cheptongei Settlements have already identified sites for solid waste disposal.

6.3.2. Community/Public Meetings

Community meetings organized by the County Project Coordination team together with the SEC members' leadership and the local leadership were undertaken at agreed venues and all community members were invited. Both stakeholder and public consultations were held during the ESIA studies and comments, concerns and recommendations have been considered in the development of this ESIA report.

6.3.2.1. Cheptongei Public Baraza

Cheptongei Settlement Community Consultative Meeting was held on 14th November 2023 at the Chief's Office Compound. The minutes are provided in annex VIII while the list of participants is provided in annex IX.

Distribution of participants

Table 19: Distribution of participants

Settlement	Date	Venue	Male	Female	PWDs	Total
Cheptongei	14/11/23	Chief's Office Compound	26	10	0	36

6.3.2.2. Issues arising from public Baraza

Table 20: Issues arising from public Baraza

No.	Questions/Concerns	Answers
1	The water supply to be connected from Kapsugut 6km away. This is because the water is very clean	The SEC Members to liaise with the engineers when they come on the ground. They will advise once they visit Kapsugut.

2	How many roads to be constructed?	All roads marked in the map will be put into consideration
3	Is Kisip having its own contractor for the project?	The county government will look for a contractor. Once the work commences the consultant will be on the ground to supervise the work as per the World Bank standards
4	Can multipurpose hall added to the list as one of the priorities?	The SEC members to raise the issue to the county government. They can assist in constructing the multipurpose hall.
5	Will the local youth be employed during the project implementation?	The contractor will be unveiled to the community members before commencement of works and the youth have been assured of employment especially the unskilled labor depending on the availability of the human resources in the area.
6	Need for Cooperation with the Consultant. Can the SEC Chairman be notified on when the consultant is visiting the settlement area 2 days before for planning purpose?	The residents to cooperate with the consultant so as to ensure smooth running of the project. The consultant will be notifying the Sec chairman in advance.
7	Will the SEC and GRC members trained on their roles?	The consultant will organize for SEC and GRC training. They will be communicated on when the training will be effected.

Plate 10: Photo plate from public baraza

6.3.2.3. Focus Group Discussions

Focus group discussion was held on 13th November 2023 at the Chief's Office. The SEC chairman with the assistance of the ward administrator took the discussants participants through the proposed projects which included roads and drainage, street lights, dumping site, public park, multipurpose hall, public toilets, market stalls, water supply, sport field and green park.

The consultant elaborated that out of the proposed projects the following would be given priorities: roads and drainage, ablution block, streetlights and high mast lights would be prioritized. He

informed the participants the significance of public participation, which would ensure awareness of KISIP 2 project by the community members. She then explained that the consultant would carry out socio economic study whereby the community members would be given data from the questionnaires to provide data that will be incorporated in the ESIA report. The members unanimously agreed on the levels of prioritization of the developments. Focus group Discussion Guide is provided in annex VI and the list of SEC members is provided in annex XI.

Table 21: Issues arising from FGDs

No.	Questions/Concerns	Answers
1	What is KISIP?	KISIP stands for Kenya Informal Settlement Improvement project
2	The water supply to be connected from Kapsugut 6km away. This is because the water is very clean.	The SEC Members to liaise with the engineers when they come on the ground. They will advise once they visit Kapsugut
3	When is the notification given?	Once the initial reports are designed and approved, notice will be given out.
4	Will the local youth be employed during the project implementation?	The contractor will be unveiled to the community members before commencement of works and the youth have been assured of employment especially the unskilled labor depending on the availability of the human resources in the area.
5	Need for Cooperation with the Consultant. Can the SEC Chairman be notified on when the consultant is visiting the settlement area 2 days before for planning purpose?	The residents to cooperate with the consultant so as to ensure smooth running of the project. The consultant will be notifying the Sec chairman in advance.

Plate 11: FGD at Chief's office

CHAPTER SEVEN

7. GRIEVANCE RESOLUTION MECHANISM

This grievance redress mechanism presents the structured process for addressing and resolving complaints or grievances from individuals or communities affected by the proposed projects. The mechanism is designed to provide an avenue for affected parties to voice their concerns, seek resolution, and ensure that their grievances are addressed appropriately. KISIP 2 project has established Grievance Redress Committee whose roles are to:

a) Conduct extensive public awareness and consultations with the affected people.
b) Help ensure that local concerns raised by PAPs as regards resettlement and compensation are promptly addressed.
c) Resolve manageable disputes that may arise relating to resettlement and compensation process. If it is unable to resolve, help refer such grievances to the SCRCC.
d) Ensure that the concerns of vulnerable persons such as the disabled, widowed women affected by the project are addressed.
e) Ensure that all the PAPs in their locality are informed about the content of the RAP.
f) Validate inventories of PAPs and affected assets;
g) Facilitate conflict resolution and addressing grievances; and
h) Participate in compensation ward sign-off

7.1. Grievance Tiers

There are four-tier grievance mechanism at the community, county, national and resolution through courts of law. It is desirable to resolve all the grievances at the community level to the greatest extent possible. To achieve the community or settlement level, grievance mechanism must be credible and generally acceptable. The grievance redress mechanisms will aim to solve disputes at the earliest possible time in the interest of all parties concerned. Grievance procedures may be invoked at any time, depending on the complaint. No person or community from whom land or other productive assets are to be taken will be required to surrender those assets until any complaints he/she has about the method or value of the assets or proposed measures are satisfactorily resolved.

Tier 1: Settlement Grievance Redress Committee (SGRC)

The first level in addressing grievances will be at the settlement. The settlement will form a Settlement Grievance Redress Committee comprising of two members from SEC, and three other respected community members who are not PAPs. The community should elect the committee in a transparent manner and after sensitization by KISIP PCT.

Tier 2: County Resettlement Implementation Committee (CRICs)

The second level of grievance mechanism will involve the County Resettlement Implementation Committee (CRICs). The CRICs will consider grievance reports forwarded to it from the community grievance committee and make a determination. The CRIC will comprise of the County Coordinator, Environment Officer, Social/Community Officer, and component Heads for Infrastructure, and Land tenure, Assistant Deputy County Commissioners, and Ward Administrator.

Tier 3: National PCT, (NRIC)

The third level of grievance mechanism will involve the National PCT, (NRIC) which will comprise of the National Project Coordinator, Heads of Components, Environment and Social Safeguard heads, and a designated Grievance Redress Officer who will be the Secretary. It will handle grievances referred to it by the CGRCs and monitor the performance of the whole GRM for the project.

Tier 4: Court of Law/ Alternative Dispute Resolution (ADR).

If complainants are not satisfied by the decisions of the grievance's committees, they can seek redress from a court of law or resort to Alternative Dispute Resolution (ADR).

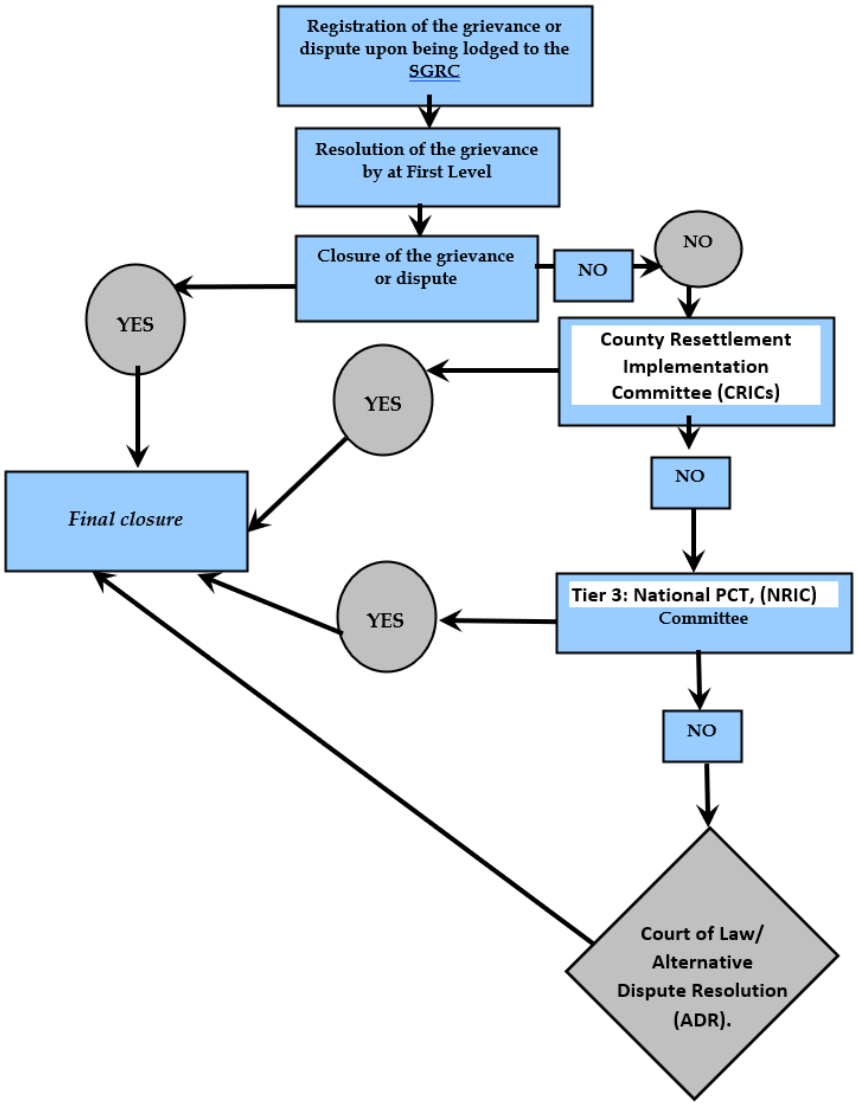

Figure 44: Grievance Redress flow Chart

7.2. World Bank Grievance Redress System (GRA)

The Grievance Redress Service (GRS) is an avenue for individuals and communities to submit complaints directly to the World Bank if they believe that a World Bank-supported project has or is likely to have adverse effects on them, their community, or their environment. The GRS

enhances the World Bank's responsiveness and accountability to project-affected communities by ensuring that grievances are promptly reviewed and addressed[8]

The GRS considers a complaint admissible when:
- The complaint relates to a World Bank-supported project that is under preparation, active, or has been closed for less than 15 months
- The complaint is submitted by individuals or communities affected by a World Bank-supported project, or by their authorized representative; and
- The complainant(s) allege that they have been or will be affected by the World Bank-supported project.

Complaints must be in writing and addressed to the GRS. They can be sent by the following methods:
- Online, access the online form
- By email to grievances@worldbank.org
- By letter or by hand delivery to the World Bank Headquarters in Washington D.C., United States or any World Bank Country Office – print and use this form (DOCX)

Information to include in a complaint
Complaints must:

- Identify the project subject of the complaint
- Clearly state the project's adverse impact(s)
- Identify the individual(s) submitting the complaint
- Specify if the complaint is submitted by a representative of the person(s) or community affected by the project
- If the complaint is submitted by a representative, include the name, signature, contact details, and written proof of authority of the representative.

Supporting evidence is not necessary but may be helpful in reviewing and resolving the complaint. The complaint may also include suggestions on how the individuals believe the complaint could be resolved. All complaints will be treated as confidential. The GRS will not disclose any personal data that may reveal the identity of complainants without their consent.

[8] https://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service

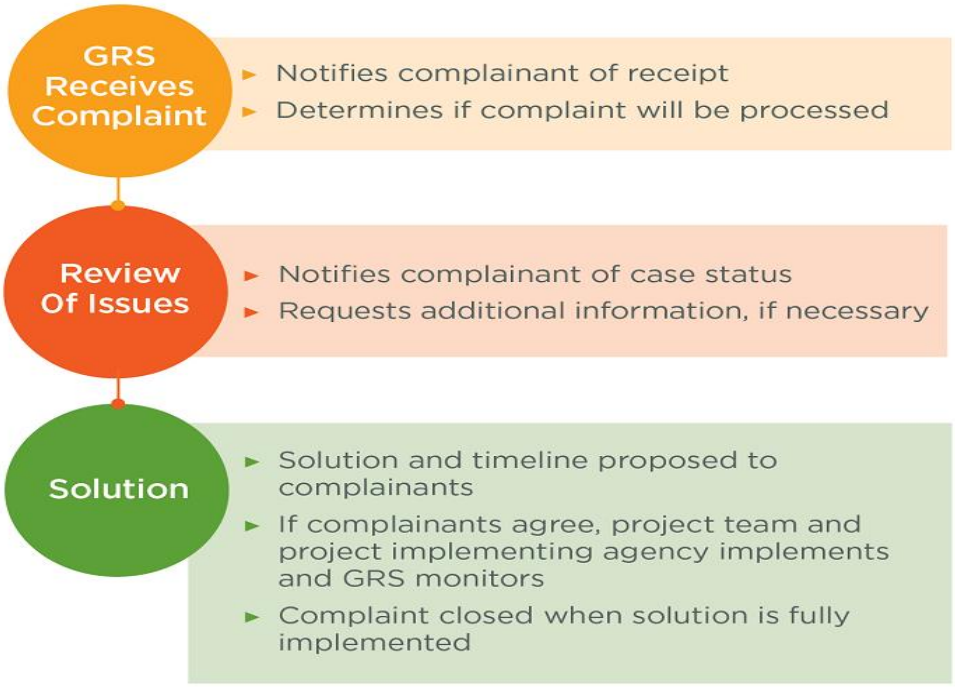

Figure 45: Grievance Redress Service (GRS) Process

CHAPTER EIGHT

8. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND ANALYSIS

8.1. Overview

This section presents the proposed projects identified possible environmental, social and economic impacts. Whilst the KISIP II project is aimed at development and improving people's lives, it can also lead to adverse impacts to both the physical and social environment. ESIA is thus a formal process to predict the environmental consequences of the proposed developments and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive impacts.

Impacts can be classified as follows:

- Positive (beneficial) or negative (adverse);
- Direct or indirect, long-term or short-term in duration, and wide-spread or local in the extent of their effect;
- Cumulative Impacts –Impacts that build up over time.

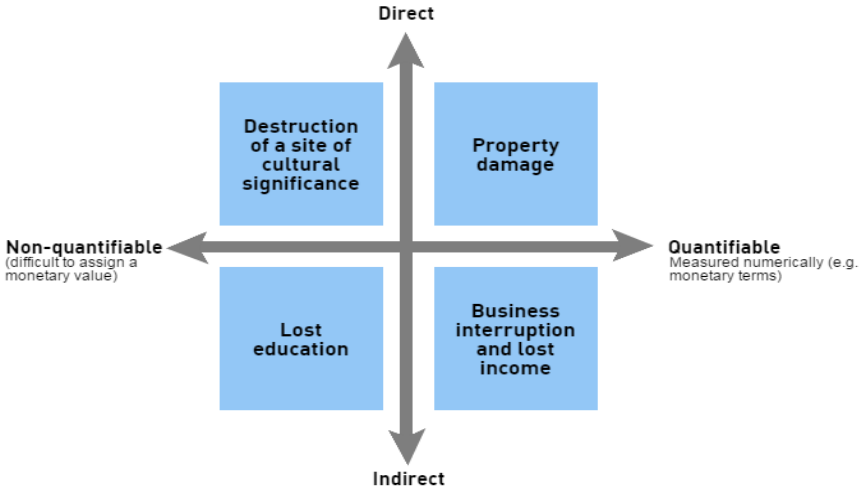

Figure 46: Impacts categories

8.2. Impact Identification and Analysis Methodology

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[9]. 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 22 and 23 below. Similarly, impacts rating was determined based on impacts consequence and impacts likelihood as shown Table 24 and 25. 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 22: 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/Neighbouring 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 23: 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

[9] https://cdn.slrconsulting.com/uploads/2020-10/TEPNA_Seismic_DEIR_App4_IA_Method.pdf

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 24: Significance Rating Matrix

Consequence (Magnitude+ Geographic extent + Duration of the Impact)															
Likelihood (Frequency of Activity + Frequency of Impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

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

Table 25: Negative Impacts ratings and associated colour codes

Significance rating	**Value**	**Colour Code**	**Negative Impact Management Recommendation**
Very high	121-150		Propose mitigation measures
High	100-120		Propose mitigation measures
Medium high	77-99		Propose mitigation measures
Low medium	51-76		Maintain current management
Low	25-50		Maintain current management
Very low	4-24		Maintain current management

8.3. Positive Environmental and Social Impacts

Table 26: Pre-construction phase positive impacts

Positive Impact	Impact Category	Impact Effects
Employment Opportunities	Direct Impact	job opportunities, providing employment for local residents and contributing to economic development in the community during design study and social and environmental studies
Community Engagement	Direct Impact	The design phase often involves community engagement, consultation, and participation, fostering a sense of ownership and collaboration

Table 27: Construction phase positive impacts

Positive Impact	Impact Category	Impact Effects
Employment Opportunities	Direct Impact	job opportunities, providing employment for local residents and contributing to economic development in the community during construction
Business opportunity	Direct Impact	Sourcing of construction material from the local community

Table 28: Operations phase positive impacts

Positive Impact	Impact category	Impact Effects
Improved Accessibility	Direct Impact	Settlement road projects enhance the connectivity of remote or underserved areas, improving accessibility for residents and facilitating the movement of goods and services
Economic Development	Direct Impact	Construction activities and the enhanced connectivity will lead to increased economic activities as it becomes easier for businesses to transport goods, reach markets, and engage in trade, ultimately boosting local economies
Increased Property Values	Direct Impact	The proposed roads is likely to positively impact property values in the surrounding areas, attracting investment and improving the overall real estate market
Job Creation	Direct Impact	The construction and maintenance the roads create employment opportunities, supporting local communities and contributing to poverty reduction
Social Integration	Indirect Impact	Improved accessibility fosters social integration by connecting previously isolated settlements, allowing residents to interact more easily and participate in community activities

Positive Impact	Impact category	Impact Effects
Education and Healthcare Access	Direct Impact	Settlement roads facilitate better access to education and healthcare facilities, as students, healthcare workers, and patients can travel more efficiently
Enhanced Emergency Response	Direct Impact	The roads improve access for emergency services, reducing response times and increasing the effectiveness of disaster management and healthcare delivery
Quality of Life Improvement	Direct Impact	Improved roads contribute to a better quality of life for residents, making it easier to access essential services, reducing travel times, and enhancing overall well-being
Infrastructure Development	Direct Impact	Settlement roads often pave the way for additional infrastructure development, such as water supply, sanitation, and electricity, contributing to a more developed and resilient community
Community Empowerment	Direct Impact	Improved infrastructure empowers communities by providing them with the means to actively participate in economic, social, and political activities.
Reduced Isolation	Direct Impact	Settlement roads reduce the isolation of remote communities, allowing the connection with urban centers and access a broader range of services and opportunities
Employment Opportunities	Direct Impact	job opportunities, providing employment for local residents and contributing to economic development in the community in terms of maintenance and operation workers
Improved Public Health	Indirect Impact	Access to clean and safe water sources, along with proper sanitation facilities, reduces the risk of waterborne diseases and contributes to overall public health.
Disease Prevention	Direct Impact	Adequate sanitation facilities, such as latrines and sewage systems, prevent the contamination of water sources and the spread of waterborne diseases like cholera and dysentery.
Reduced Mortality Rates	Direct Impact	Access to safe water and sanitation facilities is linked to lower mortality rates, particularly among children, as it helps prevent water-related illnesses.
Enhanced Hygiene Practices	Direct Impact	Provision of handwashing facilities and hygiene education encourages better hygiene practices, leading to improved personal and community health
Increased Productivity	Direct Impact	Access to reliable water sources saves time spent on water collection, particularly for women and children, allowing for increased productivity and educational opportunities
Food Security	Direct Impact	Reliable water sources contribute to improved agricultural practices for those practicing agriculture, leading to increased food security and livelihoods for communities

Gender Empowerment	Direct Impact	Provision of water and sanitation facilities can empower women and girls by reducing the time and effort spent on water-related activities, allowing for more educational and economic opportunities
Community Resilience	Direct Impact	Water projects that focus on sustainable water management contribute to community resilience in the face of climate change and water scarcity
Reduced Water-Borne Pollution	Direct Impact	Proper sanitation facilities prevent the contamination of water sources, reducing waterborne pollution and protecting aquatic ecosystems.
Social Equity	Direct Impact	Equitable access to water and sanitation facilities promotes social inclusion and reduces disparities, fostering a sense of community well-being.
Community Gathering Spaces	Direct Impacts	Ablution blocks can serve as community gathering spaces, fostering social interaction and cohesion within the community
Improved Hygiene Practices	Direct Impacts	Provision of handwashing facilities in ablution blocks promotes good hygiene practices among the community members
Enhanced Dignity and Privacy	Direct Impacts	Adequate ablution facilities contribute to the dignity and privacy of individuals, particularly in crowded or public spaces
Community Education	Indirect Impacts	Ablution blocks can serve as platforms for hygiene and sanitation education, raising awareness about the importance of cleanliness and health
Reduction of Open Defecation	Direct Impacts	Adequate sanitation facilities, including ablution blocks, contribute to the reduction of open defecation, improving community health and sanitation
Local Economic Opportunities	Indirect Impacts	Construction and maintenance of ablution blocks can create local job opportunities, contributing to the economic well-being of the community
Emergency Preparedness	Direct Impacts	Ablution blocks can serve as essential facilities during emergencies, providing access to clean water and sanitation services in times of need
Improved Accessibility	Direct Impact	Settlement road projects enhance the connectivity of remote or underserved areas, improving accessibility for residents and facilitating the movement of goods and services
Economic Development	Direct Impact	Construction activities and the enhanced connectivity will lead to increased economic activities as it becomes easier for businesses to transport goods, reach markets, and engage in trade, ultimately boosting local economies
Increased Property Values	Direct Impact	The proposed roads is likely to positively impact property values in the surrounding areas, attracting investment and improving the overall real estate market
Job Creation	Direct Impact	The construction and maintenance the roads create employment opportunities, supporting local communities and contributing to poverty reduction
Social Integration	Indirect Impact	Improved accessibility fosters social integration by connecting previously isolated settlements, allowing residents to interact more easily and participate in community activities
Education and Healthcare Access	Direct Impact	Settlement roads facilitate better access to education and healthcare facilities, as students, healthcare workers, and patients can travel more efficiently
Enhanced Emergency Response	Direct Impact	The roads improve access for emergency services, reducing response times and increasing the effectiveness of disaster management and healthcare delivery
Quality of Life Improvement	Direct Impact	Improved roads contribute to a better quality of life for residents, making it easier to access essential services, reducing travel times, and enhancing overall well-being

Infrastructure Development	Direct Impact	Settlement roads often pave the way for additional infrastructure development, such as water supply, sanitation, and electricity, contributing to a more developed and resilient community
Community Empowerment	Direct Impact	Improved infrastructure empowers communities by providing them with the means to actively participate in economic, social, and political activities.
Reduced Isolation	Direct Impact	Settlement roads reduce the isolation of remote communities, allowing the connection with urban centers and access a broader range of services and opportunities
Reduced Crime and Increased Safety	Direct Impacts	Well-lit streets and public spaces contribute to increased safety, potentially reducing criminal activity and enhancing public security
Enhanced Visibility and Reduced Accidents	Direct Impacts	Adequate lighting improves visibility, reducing the likelihood of accidents and improving overall road safety for pedestrians and motorists
Increased Sense of Community	Direct Impacts	Well-lit public spaces foster a sense of community by providing a safe and welcoming environment for residents to gather, socialize, and participate in community events
Support for Nighttime Economy	Indirect Impacts	Street lights contribute to a vibrant nighttime economy by extending business hours and supporting nighttime activities in commercial areas
Emergency Response Improvement	Direct Impacts	Adequate lighting facilitates emergency response efforts by providing clear visibility during nighttime incidents or emergencies
Improved Public Health	Direct Impacts	Well-lit streets and public spaces contribute to community well-being by promoting mental health, reducing fear of crime, and enhancing overall feelings of safety
Enhanced Aesthetics	Indirect Impacts	lighting installations contribute to the visual appeal of public spaces, making the lit areas more attractive and creating a positive ambiance
Increased Property Values	Indirect Impacts	Well-lit neighborhoods and commercial areas can contribute to increased property values, attracting investment and promoting economic growth

Table 29: Decommissioning phase positive impacts

Positive Impact	Impact Category	Impact Effects
Employment Opportunities	Direct Impact	job opportunities, providing employment for local residents and contributing to economic development in the community during decommissioning
Business opportunity	Direct Impact	The camp sites can be converted to community social amenities such has dispensary, school or police station

8.4. Possible General Negative Impacts

The generic impacts that would cut across all the proposed projects includes and is not limited to the impacts outlined in Tables 30-33 below. The mitigation plan for the se impacts are presented in section 5 of this report. The construction phase would have the following impacts:

Table 30: Pre-construction phase Negative impacts

Anticipated Negative Impact	Impact description
Displacement	The project will lead to the displacement of 2 PAPs

Table 31: Potential negative impacts during construction

Anticipated Negative Impact	Impact description
Air Pollution from dust	Emissions to air during construction and operation have the potential to impact sensitive receptors (residents), both within the immediate vicinity and the project area of influence. Construction activities such as utility diversions, road excavation and road resurfacing works will result in dust and particulate emissions which may be exacerbated by winds and dry weather. Dust emissions have the potential for temporary significant negative effects, particularly on road users and sensitive receptors adjacent to construction sites and compounds.
Noise and vibration	Noise and vibration can be a source of disturbance at sensitive receptors. Given the urban context of the proposed project, sensitive noise and vibration receptors include buildings (residential, places of worship and educational dwellings) and road users in the immediate vicinity of the existing settlements.
Flooding of storm water due to blocked drainage channels	Flooding could occur mainly due to alternation or blockage of existing drainage channels during construction. This with the changing weather patterns could lead to flooding that may lead to loss of property and life.
Water Quality	Construction activities such as diversion of utilities, road excavation and road widening have the potential to create pathways for pollutants to enter watercourses and indirectly impact on water quality. Soil compaction during construction has the potential to increase the rate of surface water runoff.
Destruction of water pipes or disruption of water supply, sewer and power lines	Construction activities may disrupt the daily lives of community members, affecting routines and causing inconvenience
Incidence of HIV/AIDS	Migration of people from different regions with diverse moral backgrounds through various workforce may lead to behavioral influences which may increase the spread of diseases such as Human Immuno-Deficiency Virus (HIV),
Vegetation loss	Clearing the vegetation would lead to soil erosion

Anticipated Negative Impact	Impact description
Soil loss and soil pollution	Construction activities will require the excavation of existing made ground and the existing roadbed. Construction activities may create pathways between contaminants from the existing made ground and the local environment and groundwater resources which has the potential to result in significant negative effects (both temporary and permanent). In addition, construction activities may result in generation and removal of materials and solid waste generation.
Solid waste generation	Solid wastes will mainly emanate from the construction activities and will include excavated soil, cement storage bags and other packaging materials used during construction, spillage of oil and grease from machines used in excavation, waste from repair and maintenance of construction equipment, part demolition waste among others
Visual impacts	Temporary structures, construction debris, and equipment may create visual eyesores during the construction phase while Dust generated from construction activities can contribute to reduced air quality, affecting the clarity of views among other impacts
Potential impact on traffic/ obstruction of temporary access	Construction of the proposed infrastructure projects has the potential to impact people's day-to-day travel activities. Temporary traffic diversions, and in some instances temporary lane or road closures, may be required to undertake construction activities. Temporary traffic diversions and road closures may also reduce traffic capacity.
Accidental spills & leakages	Accidental spills from the construction vehicles and construction materials could occur during construction. This would lead to soil, surface and subsurface water pollution
Occupational Health and Safety Risks	During construction, workers would be exposed to various health and safety risks that would require control measures be taken. Opportunities for employment will also be created/available during the construction of the projects that would require hiring policies and employ management plans.
Building materials	Sourcing the building materials could lead to resource depletion and could sourcing from far areas could also lead to high costs and high carbon footprints
Impact on surface water bodies	This could occur once vegetation is cleared and the soils are exposed to erosion factors. Material piles also if not properly secured would lead to downstream contamination of existing nearby springs and rivers
Sustainability and Climate Change Impacts	The potential impacts include greenhouse gas emissions, resource depletion, air and water pollution etc.
Inadequate stakeholder Engagement.	Conflicts and delay in project due inadequate stakeholder engagement

Anticipated Negative Impact	Impact description
Exclusion of disadvantaged and vulnerable groups	Project benefit may not reach the vulnerable population hence subjecting to increased poverty
Ineffective Grievance Management	Grievances may derail the project if not resolved in a timely manner
Gender-Based Violence Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH	Women and the adolescent girls may be exposed to SEAH from workers employed during the construction of the project
Child Exploitation and Abuse	Employment of children to work in the project may expose them to abuse to and injury

Table 32: Negative Impacts during Operations Phase

Anticipated Negative Impact	Impact description
Air Pollution	Emissions from vehicles and motorbikes using the roads on a daily basis will contribute to air pollution during operation phase of the project. The impact on air quality during repairs and maintenance (operation phase) is expected to occur
Noise Pollution	Noise emission and associated impacts during repairs and maintenance is expected to be low and will emanate from motorized equipment as well as noise from the motor vehicles used on the roads.
Possibility of flooding due to blocked drainage systems	Flooding could occur mainly due to blockage of the drainage systems by solid waste.
Possible vandalism and theft of accessories	Installed roads, lights infrastructure could be targeted for theft
Accidents from Speeding Vehicles	Increased risk of accidents due to vehicles traveling at high speeds along the road network
Trips and fall into uncovered drainages	Potential risk of individuals falling into open or uncovered drainage channels due to lack of safety measures
Possibility of Spread of Waterborne Diseases from Contaminated Piped Water	Risk of waterborne diseases spreading through the community due to contamination of piped water sources
Destruction of roads and amenities from riots and demonstrations	Damage to roads and associated infrastructure as a result of civil unrest or public protests
Possibility of encroachment along the access road	Risk of unauthorized occupation or development along the access road, leading to encroachment issues
Inadequate stakeholder Engagement	Numerous grievances from the public regarding ownership and operations of the projects

Anticipated Negative Impact	Impact description
High Maintenance Cost	
In effective Grievances Management	Grievance on the use of the infrastructure and employment
Incidence of HIV/AIDS	Multiple sexual interactions by employees could lead to spread of HIV/Aids
GBV-Sexual Exploitation and Abuse (SEA) of communities by project workers and Sexual Harassment (SH) amongst employees	This could unfold when operators ask for favors from job seekers for an employment chance. This could also unfold when employees are exploited by their leadership to retain their jobs among other reasons
Child Exploitation and Abuse	Employment of under aged individuals during operation stages of the project
Exclusion of disadvantaged and vulnerable groups e.g PWDs, elderly, youth, the sick, the poor, single-women, OVC etc.	Unequal employment opportunities denied to the vulnerable persons
Impact surface water surface water bodies	Storm water runoff from impervious surfaces like roads and buildings, carrying pollutants into water bodies; Discharge of wastewater from industrial processes or operations, potentially contaminating rivers and streams

Table 33: Decommissioning Phase Negative Impacts

Anticipated Negative Impact	Impact description
Waste Generation	The decommissioning of infrastructure projects inevitably generates various types of waste, presenting both environmental and logistical challenges. Construction and demolition activities result in the production of significant quantities of waste materials, including concrete, asphalt, metals, wood, plastics, and other construction debris. This waste poses several impacts on the environment, public health, and resource utilization
Impact in surface water bodies	Potential release of pollutants or contaminants during the dismantling or removal of infrastructure
Child exploitation	Child exploitation may manifest in various forms, including child labor, trafficking, and sexual exploitation. Children may be forced or coerced into hazardous work environments, such as scavenging through construction debris or engaging in manual labor, to supplement family income or as a result of displacement from their homes. Additionally, the breakdown of social structures and protective mechanisms during decommissioning may expose children to increased risks of abduction, trafficking, and sexual exploitation by opportunistic individuals or criminal networks.

GBV-Sexual exploitation	Gender-based violence (GBV) can escalate during decommissioning, with women and girls facing heightened risks of physical, sexual, and psychological abuse. Displacement, overcrowded living conditions, and disruption of community support networks can exacerbate existing vulnerabilities and create environments conducive to GBV. Women may face increased risks of domestic violence, sexual harassment, and exploitation, both within their homes and in public spaces, as social norms and power dynamics shift during decommissioning activities.

8.5. Negative Environmental and Social Impact ratings

The section below discusses the adverse impacts anticipated from implementation of the proposed projects. Common impacts such as those from construction activity have been lumped together so that only those specific to sub-projects are discussed separately. All civil works as proposed under KISIP investment has potential to generate impacts as listed below: -

8.5.1. Pre - Construction Phase

8.5.1.1. Inadequate planning and engagements

Table 34: Inadequate planning Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	2
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	4
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	80

Proposed Mitigation Measures

- *Review and develop of all environmental and social Management plans*
- *Communicate with the occupiers of land, stakeholders, and all relevant authorities*

8.5.1.2. Lack of public notification of commencement of work

Table 35: Lack of public notification Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	4
Likelihood	Frequency/duration of activity	5
	Frequency of impact	5

Impact Significance Rating (Consequence × likelihood)	**High**	110

Proposed Mitigation Measures

Notify the public especially the residents on the commencement giving all relevant details

8.5.1.3. Losses or damages related to the clearance of corridors.

Table 36: Damages related to clearance of corridor Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	5
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	90

Proposed Mitigation Measures

- *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.*
- *Notify the public on the areas to be cleared*
- *Restrict clearance to the marked areas*
- *Facilitate all affected persons and address all grievances prior to commencing works.*

8.5.1.4. Leasing/allocation of land for Contractor facilities and workers' camp.

Table 37: Leasing of land Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	3
Likelihood	Frequency/duration of activity	1
	Frequency of impact	2
Impact Significance Rating	**Very Low**	15

Impact Mitigation

- *Facilitate all affected persons and address all grievances prior to commencing works.*
- *Notify the public on the areas to be cleared*
- *Restrict clearance to the marked areas*

8.5.1.5. Displacement Impacts

The Kenya integrated Slum improvement project in Cheptongei will affect structures belonging to 2 PAPs. The asset inventory of the PAPs is provided in Annex: X of this report.

Table 38: Displacement Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	5
Likelihood	Frequency/duration of activity	5
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	**High**	100

Proposed Mitigation Measures

- *Adequate notice period to relocate business wares and structures,*
- *Minimize damages and compensate the trader (1kiosk), owners of the 2 perimeter walls,*
- *Hasten the construction process to reduce period of inconvenience/length of impacts*
- *Develop comprehensive resettlement plans that outline procedures for compensation, alternative housing, and livelihood restoration*

8.5.2. Construction Phase

8.5.2.1. Air Pollution from dust

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 39: Air Pollution Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	4
Likelihood	Frequency/duration of activity	3
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	**High**	104

Proposed Mitigation:

- *Use water spray systems to control dust and the active construction sites;*
- *Schedule high-dust activities during low-wind periods;*

- *Provide workers with personal protective equipment (PPE) like dust masks;*
- *Display warning signs and implement traffic control measures;*
- *Inform nearby residents and businesses about construction activities and potential dust impacts;*
- *Train construction workers on dust control measures and the use of personal protective equipment;*
- *Engage with the local community to provide information on the air quality impact challenges they are encountering and establish their mitigation measures.*

Air pollution from source emissions

Source emissions pollution during construction refers to the release of pollutants directly from construction activities and equipment. These emissions can have adverse effects on air quality, human health, and the environment. Common sources of emissions during construction include construction equipment, machinery, and materials.

Proposed Mitigation:

- *Use fuel efficient construction equipment;*
- *Install emission control technologies such as diesel particulate filters and selective catalytic reduction systems on construction equipment;*
- *Train operators on best practices for equipment operation to optimize fuel efficiency and reduce emissions;*
- *Implement regular maintenance schedules to ensure equipment operates efficiently and meets emission standards;*
- *Undertakes baseline air quality to assess particulates and gases before start of construction and;*
- *Ensure continuous air quality monitoring throughout the entire construction period.*

8.5.2.2. Noise and vibration

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 40: Noise Pollution Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4

	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	4
Likelihood	Frequency/duration of activity	3
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	**Medium High**	88

Proposed Mitigation

- *Use equipment that is properly fitted with noise reduction devices such as mufflers;*
- *Use equipment that have low noise emissions as stated by the manufacturers;*
- *Standard restrictions to hours of site woks;*
- *Workers should be provided with personal protective equipment;*
- *The residents will be informed ahead of the commencement of works.*
- *Encourage the adoption of low noise technology and practice for machines during construction.*
- *Construction activities should be limited to daylight hours although scheduling may require overnight operations on specific occasions;*
- *Limit operation for specific loud pieces of equipment or operations to day-time;*
- *Require contractors to prepare and implement a Vehicle & Traffic Management Plan (VTMP);*
- *Ensure continuous noise level monitoring throughout the entire construction period.*

8.5.2.3. Soil and Water Pollution

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 41: Surface and ground water pollution Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	3
Likelihood	Frequency/duration of activity	2
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Low**	40

Proposed Mitigation Measures

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

8.5.2.4. Surface Water Runoff

Soil exposed from site clearance and de-vegetation, Improper location of stockpiles of sand, gravel, cement, etc., at the construction site could cause fine materials to be washed away during heavy rainfall events.

Table 42: Water runoff 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	2
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	**Low**	28

Proposed Mitigation measures

- *Schedule construction activities to avoid periods of heavy rainfall when the risk of runoff is higher;*
- *Develop and implement comprehensive storm water management plans that include erosion control measures*.

8.5.2.5. Solid Waste Generation

Solid wastes will mainly emanate from the construction activities and will include excavated soil, cement storage bags and other packaging materials used during construction, spillage of oil and grease from machines used in excavation, waste from repair and maintenance of construction equipment, part demolition waste among others.

Table 43: Solid water 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	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	Low Medium	56

Proposed Mitigation Measures

- *Provide clearly labeled bins for source separation of different types of waste (e.g., metal, wood, concrete) to encourage recycling;*
- *Train construction workers on the importance of source separation and proper disposal practices to minimize contamination;*
- *Develop and implement a comprehensive program for the reuse and recycling of construction waste materials, including concrete, wood, metal, and other recyclables*
- *Prioritize material efficiency and waste reduction by planning construction activities to minimize excess materials and packaging;*
- *Provision of toilet facilities for use by the contractor staff and other workers during construction and operation phases respectively. Provide portable sanitary conveniences for the construction workers for control of sewage waste. A ratio of approximately 25 workers per chemical toilet should be used;*
- *Develop strategies (waste management plan) for management of specific waste streams prior to construction phase;*
- *Store hazardous wastes such as used oils and other chemicals in bunded areas away from watercourses.*

8.5.2.6. Potential Impact on Traffic/ Obstruction of Temporary Access

The potential impact on traffic and obstruction of temporary access during construction is a significant consideration. Construction activities can disrupt normal traffic flow and access routes, leading to safety concerns and inconvenience for the locals. The potential impacts include traffic congestion, obstruction of access routes, pedestrian safety risks, emergency vehicle access etc.

Table 44: Traffic 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	2
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Very Low**	24

Proposed Mitigation Measures

- *Develop a comprehensive traffic management plan that includes measures to minimize congestion, regulate traffic flow, and ensure safe pedestrian movement;*
- *se clear and visible signage to inform the public about construction activities, detours, and expected delays. Communicate construction schedules in advance;*
- *Schedule construction activities during off-peak hours to minimize disruption to normal commuting times;*
- *Identify and promote alternative routes for motorists to bypass construction zones, reducing congestion on primary routes;*
- *Provide safe and well-marked pedestrian walkways, ensuring that pedestrians can navigate around construction zones without compromising their safety;*
- *Engage with the local community through the SEC committee to inform them about construction plans, potential traffic impacts, and mitigation measures. Solicit feedback and address concerns;*
- *Plan construction activities in phases to minimize the extent of road closures and traffic disruptions at any given time;*
- *Coordinate with emergency services to establish clear emergency access routes and ensure that construction activities do not impede their response.*

8.5.2.7. Occupational Health and Safety Risks

Occupational health and safety impacts during construction are of paramount concern, as construction sites involve various hazards that can pose risks to workers. Addressing these impacts is crucial to ensure the well-being of construction workers and prevent accidents and injuries. These hazards include falls, struck-by hazards, caught between hazards, electrical hazards, ergonomic hazards, chemical and biological hazards, psychosocial hazards, noise and vibration etc.

Table 45: Occupational Safety Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	3
Likelihood	Frequency/duration of activity	4
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Medium High**	77

Proposed Mitigation Measures

- *Provide comprehensive safety training for all workers, emphasizing hazard awareness, safe work practices, and emergency procedures.*
- *Ensure the use of appropriate PPE, such as hard hats, safety glasses, gloves, and respiratory protection.*

- *Conduct regular inspections and audits to identify and address potential hazards on the construction site.*
- *Develop and communicate emergency response plans to address potential accidents or incidents promptly.*
- *Implement health monitoring programs to track workers' exposure to hazardous substances and identify potential health issues.*
- *Design workstations and processes with ergonomic principles to minimize strain and prevent musculoskeletal disorders.*
- *Promote overall worker well-being through wellness programs and initiatives addressing both physical and mental health.*

8.5.2.8. Soil Erosion and Loss

There is a risk of soil erosion during excavation/ construction works, or if inadequate measures for storm water management is not put in place. The natural drains around the project area are expected to receive eroded soil.

Table 46: Soil erosion Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	3
Likelihood	Frequency/duration of activity	2
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Low**	40

Proposed Mitigation measures

- *Practice selective vegetation clearing where necessary;*
- *Schedule construction activities to avoid periods of heavy rainfall when the risk of runoff is higher;*
- *Cover soil stockpiles and construction materials on site and on transit to prevent wind and water erosion;*
- *Minimize the extent of grading and disturbance to natural terrain, preserving existing vegetation and soil structure.*
- *Use excavated soils for backfilling while carry away excess soil for appropriate disposal.*
- *Carry out slope protection along the steep slopes to rehabilitate areas where excavation has taken place to prevent future collapse and erosion;*
- *Re-vegetating disturbed areas once construction and demolition works are completed during construction and decommissioning phases, respectively.*

8.5.2.9. Drainage Impacts - Flooding of storm water due to blocked drainage channels

Flooding could occur mainly due to alternation or blockage of existing drainage channels during construction. This with the changing weather patterns could lead to flooding that may lead to loss of property and life.

Table 47: Flooding Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	4
Likelihood	Frequency/duration of activity	3
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium - High**	77

Proposed Mitigation Measures

- *Designate emergency overflow routes or areas where excess water can be safely directed during heavy rainfall that will help to prevent flooding in critical areas by providing an alternative path for excess water;*
- *Develop and implement comprehensive storm water management plans that address the entire watershed;*
- *Assess and Implement early warning systems to provide timely alerts about potential flooding that could guide on construction timings;*
- *Develop and enforce construction waste management practices to prevent improper disposal of construction debris and materials into drainage channels;*
- *Rationale: Strict enforcement discourages practices that contribute to blockages in the drainage system.*

8.5.2.10. Destruction of the physical Environment

The requirement and use of local building materials during construction can have various implications for sustainability, cost-effectiveness, and community development. Some materials may be abundant and others need to be sourced from outside the area. Locally available materials could be easy to source and thus reduce environmental footprint, more cost effective however, quality may need to be assessed.

Table 48: Construction Materials Impacts Rating

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

Criteria		Rating
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	88

Potential Mitigation Measures

- *The construction contract should stipulate that the Contractor sources materials from an approved site;*
- *The tender documents should specify required standards and certification for procurement of all materials and appliances;*
- *The sources of all required materials should be inspected prior to acquisition to confirm that they are legitimate operations;*
- *The contractor should ensure that he sources construction materials sustainably;*
- *The contractor should ensure that the storage area for materials is good so as to avoid spoils and waste;*
- *Possibly invest in local capacity building to enhance the skills and capabilities of local craftsmen and suppliers, ensuring that they can meet project requirements;*
- *Collaborate with local industries to develop and supply materials that meet project specifications, fostering a sustainable supply chain.*

8.5.2.11. Sustainability and Climate Change Impacts

Sustainability and climate change impacts during construction are critical considerations as the construction industry significantly influences environmental and social aspects. Addressing these impacts is essential for creating resilient, eco-friendly, and socially responsible built environments. The potential impacts include greenhouse gas emissions, resource depletion, air and water pollution etc.

Table 49: Climate Change Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	3
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	66

Proposed Mitigation measures

- *Use of low emission vehicles for mobilization activities;*
- *Use generators with low emissions;*
- *Switch-off engines when not in use;*
- *Conduct regular maintenance of vehicles and equipment to minimize emissions;*

- *Disturbed areas that will no longer be developed can be revegetated with local vegetation to serve as buffer for future activities and operation and to increase local sequestering capacity for greenhouse gases;*
- *Ensure regular monitoring of possible GHGs emissions.*

8.5.2.12. Vegetation loss

A number of ornamental plants and exotic trees were identified along the project areas. Site preparation by vegetation clearance and excavations exposes soils leaving them vulnerable to erosion by heavy rainfall and surface run-off.

Table 50: Vegetation loss 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	4
	Frequency of impact	5
Impact Significance Rating (Consequence × likelihood)	**Low**	45

Proposed Mitigation Measures

- *Conduct a comprehensive assessment of the existing vegetation, including species diversity, ecological value, and health to assist in developing targeted mitigation strategies;*
- *Establish a monitoring program to track vegetation recovery and adjust mitigation strategies based on ongoing assessments.*

8.5.2.13. Immorality and Increase in Sexually Transmitted Diseases

Migration of people from different regions with diverse moral backgrounds through various workforce may lead to behavioral influences, which may increase the spread of diseases such as Human Immuno-Deficiency Virus (HIV), Acquired Immune Deficiency Syndrome (AIDS) and other Sexually Transmitted Infections (STIs).

Table 51: STI diseases Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	5
Likelihood	Frequency/duration of activity	4
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Medium High**	98

Proposed Mitigation Measures

- *Implement comprehensive sexual education programs that cover safe sex practices, STD prevention, and the importance of consensual relationships. This will promote awareness and equips individuals with the knowledge to make informed decisions about their sexual health;*
- *Ensure easy access to condoms and other forms of contraception to encourage safe sexual practices;*
- *Establish feedback mechanisms to receive input from the community about the effectiveness of prevention and education programs.*

8.5.2.14. Possibility of encroachment along the access road

Table 52: Encroachment Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	5
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	Low Medium	63

Mitigation Measures

- *Sensitize locals on penalties associated with encroachment to road reserves*

8.5.2.15. Inadequate stakeholder Engagement

Table 53: Inadequate Stakeholder Consultations Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	4
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**High**	104

Mitigation Measures

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

8.5.2.16. High Project Maintenance Cost

Table 54: High project Maintenance Cost Impacts Rating

Criteria	Rating

Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	4
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	99

Mitigation Measures

- *Use quality material during the construction phase to reduce cost of maintenance*
- *Engage local communities in road maintenance efforts to foster a sense of ownership and responsibility*
- *Train and sensitize maintenance staff on effective technologies*
- *Conduct regular maintenance and inspection of the road*

8.5.2.17. Ineffective Grievance Management

Table 55: Ineffective Grievance Management Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	5
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**High**	117

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.*

8.5.2.18. GBV-Sexual Exploitation

Table 56: GBV during Construction Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	5
Likelihood	Frequency/duration of activity	4

	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	80

Mitigation Measures

- *Conduct comprehensive training sessions for all construction workers, supervisors, and contractors on recognizing, preventing, and responding to GBV and SEA. Raise awareness about the impact of these issues and emphasize the importance of respectful behavior and gender equality on construction sites;*
- *Establish clear codes of conduct and policies that explicitly prohibit GBV and SEA, including harassment, exploitation, and discrimination*
- *Create a safe and secure working environment on construction sites through adequate lighting, secure facilities, and effective security measures*
- *Assign dedicated personnel to monitor construction sites regularly for any signs of GBV or SEA*
- *Engage with local communities to raise awareness about GBV and SEA, as well as available support services*
- *Design construction projects with gender considerations in mind, including the provision of separate and secure facilities for men and women, such as restrooms and changing areas*
- *Establish accessible and confidential reporting mechanisms for workers to report incidents of GBV or SEA*
- *Hold contractors, supervisors, and project managers accountable for preventing and addressing GBV and SEA on construction sites*

8.5.2.19. Child Exploitation and Abuse

Table 57: Child Abuse Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	4
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	72

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 labor laws and labour management practices. Put visible signage on site "No Jobs for children.*

8.5.3. Project Operations Phase Impacts

8.5.3.1. Air pollution

Emissions from vehicles and motorbikes using the roads on a daily basis will contribute to air pollution during operation phase of the project. The impact on air quality during repairs and maintenance (operation phase) is expected to occur.

Table 58: Air Pollution Impacts Rating during Operations

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	5
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	66

Mitigation

- *Promote the use of cleaner vehicles, enforce emission standards, and implement dust control measures.*
- *Use of manual equipment to minimize the air quality impacts from motorized machinery.*

8.5.3.2. Noise pollution

Noise emission and associated impacts during repairs and maintenance is expected to be low and will emanate from motorized equipment as well as noise from the motor vehicles on the roads.

Table 59: Noise Pollution Impacts Rating during Operations

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	5
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	66

Mitigation: *use of manual equipment to minimize the noise levels impacts from motorized machinery Provide speed limits.*

8.5.3.3. Possibility of flooding due to blocked drainage systems

Flooding could occur mainly due to blockage of the drainage systems by solid waste.

Table 60: Flooding Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	4
Likelihood	Frequency/duration of activity	3
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Low**	50

Proposed Mitigation Measures

- *Designate emergency overflow routes or areas where excess water can be safely directed during heavy rainfall that will help to prevent flooding in critical areas by providing an alternative path for excess water;*
- *Develop and implement comprehensive storm water management plans that address the entire watershed;*
- *Assess and Implement early warning systems to provide timely alerts about potential flooding that could guide on construction timings;*
- *Develop and enforce construction waste management practices to prevent improper disposal of construction debris and materials into drainage channels;*
- *Rationale: Strict enforcement discourages practices that contribute to blockages in the drainage system.*

8.5.3.4. Possible Vandalism and Theft of Accessories

Table 61: Vandalism Impacts Rating during Operations

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	5
	Duration of Impact	2
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	66

Proposed Mitigation Measures

- *Employ security personnel or community watch programs;*
- *Use tamper-resistant accessories or materials;*
- *Educate the community on the importance of infrastructure protection.*
- *Engage local authorities and law enforcement in monitoring and preventing vandalism.*

8.5.3.5. Accidents from Speeding Vehicles

Table 62: Accidents Impacts Rating during Operations

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	5
Likelihood	Frequency/duration of activity	4
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Medium High**	77

Proposed Mitigation measures

- *Implement speed limits and enforce traffic regulations.*
- *Install speed bumps or rumble strips.*
- *Display prominent road signs indicating speed limits.*

8.5.3.6. Trips and fall into uncovered drainages

Table 63: Trip and fall Impacts Rating during Operations

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	2
	Duration of Impact	5
Likelihood	Frequency/duration of activity	4
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Medium High**	77

Proposed Mitigation measures

- *Ensure the drainage system is covered especially near the pedestrian access areas*
- *Ensure clear warning signage are displayed*

8.5.3.7. Possibility of Spread of Waterborne Diseases from Contaminated Piped Water

Table 64: Water Borne Diseases Impact Rating during Operations

Criteria		Rating
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	4
Likelihood	Frequency/duration of activity	3
	Frequency of impact	2
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	60

Proposed Mitigation Measures

- *Regularly test and monitor water quality from public watering points;*
- *Install water treatment facilities if necessary;*
- *Educate the public on safe water practices.*

8.5.3.8. Destruction of roads and amenities from riots and demonstrations

Table 65: Riots Impacts Rating during Operations

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	4
Likelihood	Frequency/duration of activity	3
	Frequency of impact	3
Impact Significance Rating (Consequence × likelihood)	**Low**	48

Proposed Mitigation Measures

- *Conduct awareness campaigns on the importance of the infrastructure and its impact on the community.*
- *Communicate the potential consequences of destructive actions during riots and demonstrations;*
- *Familiarize project stakeholders with legal consequences for engaging in destructive actions;*
- *Collaborate with local authorities to enforce legal measures against those involved in vandalism.*

8.5.3.9. Possibility of encroachment along the access road

Table 66: Encroachment Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	1
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	5
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Low Medium**	63

Mitigation Measures

- *Sensitize locals on penalties associated with encroachment to road reserves*

8.5.3.10. Inadequate stakeholder Engagement

Table 67: Inadequate Stakeholder Engagement Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	4
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**High**	104

Mitigation Measures

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

8.5.3.11. Maintenance Cost

Table 68: High Maintenance Cost Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	4
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	99

Mitigation Measures

- *Use quality material during the construction phase to reduce cost of maintenance*
- *Engage local communities in road maintenance efforts to foster a sense of ownership and responsibility*
- *Train and sensitize maintenance staff on effective technologies*
- *Conduct regular maintenance and inspection of the road*

8.5.3.12. Ineffective Grievance Management

Table 69: Ineffective Grievance Management Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	3
	Duration of Impact	5
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4
Impact Significance Rating	**High**	117

(Consequence × likelihood)		

Mitigation Measures

- *Log, date, process, resolve, and close out all reported grievances are in a timely manner.*

8.5.3.13. GBV-Sexual Exploitation

Table 70: Gender based violence Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	5
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	80

Mitigation Measures

- *Undertake sensitization and training on gender-based violence*
- *Develop clear policies that explicitly condemn Gender based Violence(GBV) and Sexual Exploitation and Abuse (SEA)*
- *Engage with local communities to raise awareness about GBV and SEA, their impact, and available support services*
- *Establish confidential and accessible reporting mechanisms for survivors or witnesses of GBV and SEA.*
- *Develop protocols for responding to reports of GBV and SEA promptly and effectively*
- *Conduct regular risk assessments to identify potential vulnerabilities and risks related to GBV and SEA within project operations*
- *Integrate gender considerations into all aspects of project design, implementation, monitoring, and evaluation*
- *Hold staff and partners accountable for their behavior and adherence to GBV and SEA policies through monitoring, supervision, and performance evaluation*
- *Work closely with government agencies, local authorities, NGOs, and other stakeholders to coordinate efforts and share resources in addressing GBV and SEA*
- *Collect disaggregated data on GBV and SEA incidents to better understand patterns, trends, and underlying factors*

8.5.3.14. Child Exploitation and Abuse

Table 71: Child Exploitation Impacts Rating

Criteria		**Rating**
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	5
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4

Impact Significance Rating (Consequence × likelihood)	**Medium High**	126

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 labor laws and labour management practices. Put visible signage on site "No Jobs for children.*

8.5.4. Project decommissioning phase impacts

8.5.4.1. Solid Waste Generation

Solid wastes will mainly emanate from the decommissioning activities and will include excavated soil, Unused or Surplus Materials, electronic waste, packaging materials, spillage of oil and grease from machines and general wastes among others.

Table 72: Solid water 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	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	Low Medium	56

Proposed Mitigation Measures

- *Re-use and recycling of materials whenever possible. Salvage and repurpose materials such as bricks, concrete, wood, and metal for future projects. Establish recycling programs for materials such as metals, plastics, glass, and electronic waste;*
- *Ensure that waste is transported and disposed of by licensed and reputable waste management companies following proper procedures. Maintain records of waste disposal activities to track waste volumes and ensure compliance with regulations*

8.5.4.2. Child Exploitation and Abuse

Table 73: Child Exploitation Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	5
	Spatial Scope/Geographic Extent of Impact	4
	Duration of Impact	5
Likelihood	Frequency/duration of activity	5
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	126

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 labor laws and labour management practices. Put visible signage on site "No Jobs for children.*

8.5.4.3. GBV-Sexual Exploitation

Table 74: Gender based violence Impacts Rating

Criteria		Rating
Consequences	Severity/Magnitude of Impact	4
	Spatial Scope/Geographic Extent of Impact	1
	Duration of Impact	5
Likelihood	Frequency/duration of activity	4
	Frequency of impact	4
Impact Significance Rating (Consequence × likelihood)	**Medium High**	80

Mitigation Measures

- *Undertake sensitization and training on gender-based violence*
- *Develop clear policies that explicitly condemn Gender based Violence(GBV) and Sexual Exploitation and Abuse (SEA)*
- *Engage with local communities to raise awareness about GBV and SEA, their impact, and available support services*
- *Establish confidential and accessible reporting mechanisms for survivors or witnesses of GBV and SEA.*
- *Develop protocols for responding to reports of GBV and SEA promptly and effectively*

- *Conduct regular risk assessments to identify potential vulnerabilities and risks related to GBV and SEA within project operations*
- *Integrate gender considerations into all aspects of project design, implementation, monitoring, and evaluation*
- *Hold staff and partners accountable for their behavior and adherence to GBV and SEA policies through monitoring, supervision, and performance evaluation*
- *Work closely with government agencies, local authorities, NGOs, and other stakeholders to coordinate efforts and share resources in addressing GBV and SEA*
- *Collect disaggregated data on GBV and SEA incidents to better understand patterns, trends, and underlying factors*

CHAPTER NINE

9. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

9.1. Overview

This chapter outlines the environmental management plan for the impacts mentioned in the preceding chapter (8) summarizes the key identified elements and their mitigation measures, the actions to be taken by various parties and the monitoring activities. The EMMP has been presented in line with the project phases including the construction phase, the operations phase and decommissioning phase.

9.2. Objectives of this ESMMP

This ESMMP has been developed as a tool to guide the proponent and the contractor during the project implementation since it captures the anticipated impacts and therefore acts as a preventive measure towards possible social and economic disruptions that may arise during project implementation. It provides the indicative mitigation measures, the monitoring indicators, responsibilities for mitigation and monitoring and the anticipated costs.

The EMPs presented in this Chapter therefore summarizes the environment and social impacts identified and their proposed mitigation measures, the actions to be taken by various parties and the monitoring indicators. An indication of the implementation and monitoring timelines is also provided. Tables 75 – 78 below present the Environmental Management and Monitoring Plans during pre-construction, construction, operation and decommissioning phases of the project.

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9.3. Pre-Construction Phase

Table 75: Pre-construction phase Impacts

Project	Potential Environmental and Social Impacts	Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
Roads, Footpath and Storm water drainage Projects Water supply projects Lighting project	Inadequate planning and engagements	• Review and develop of all environmental and social Management plans • Communicate with the occupiers of land, stakeholders, and all relevant authorities	• Availability of environmental, social, safety and security management plans • Aligned communication with the project affected persons along the construction corridors	Contractor Proponent	Before construction	No additional cost
Roads, Footpath and Storm water drainage Projects Water supply projects Lighting project	Lack of public notification of commencement of work	Notify the public especially the residents on the commencement giving all relevant details	• Notifications sent to the public especially the project affected persons along and around the construction corridors	Contractor Proponent	Before construction	No additional cost
Roads, Footpath and Storm water drainage Projects Water supply projects Lighting project	Losses or damages related to the clearance of corridors.	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	• Consultation minutes and signed lists of participants. • Type and amount of facilitation/compensation provided to affected persons. • Number of Project affected Persons	Contractor Proponent	Before construction	No additional cost

Project	Potential Environmental and Social Impacts	Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		all grievances prior to commencing works. Notify the public on the areas to be cleared Restrict clearance to the marked areas	facilitated/compensated. • Number and type of Grievances reported. • Number of Grievances resolved/not resolved.			
Roads, Footpath and Storm water drainage Projects Water supply projects Lighting project	Leasing/allocation of land for Contractor facilities and workers' camp. (Implement agreements for use of land and restoration).	Evidence of leased space/land	• Lease agreements	Contractor Proponent	Before construction	No additional cost
Road, drainage and water supply Projects	Displacement Impacts of 2 PAPs	• Adequate notice period to relocate business wares and structures, • Minimize damages and Compensate traders for damages, time and income lost • Hasten the construction process to reduce period of inconvenience/length of impacts	• Documentation of notice periods provided to affected residents and businesses; • Compensation records for traders affected by construction; • Progress tracking of construction activities against the planned schedule;	Contractor Proponent	Before construction	Ksh 20,000

Project	Potential Environmental and Social Impacts	Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		Develop comprehensive resettlement plans that outline procedures for compensation, alternative housing, and livelihood restoration	• Implementation of the Resettlement Action Plan.			

9.4. Construction Phase Environmental and Social Impacts Management and Monitoring Plan

Table 76: Construction Phase ESMP Matrix

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
ENVIRONMENTAL IMPACTS					
Water Resource Impacts	**Surface and sub-surface soil and water pollution** ● Store construction chemicals in designated areas with proper containment measures; ● Develop a spill prevention and response plan to address accidental releases of hazardous materials; ● Conduct educational programs for construction crews on proper soil management practices and the importance of preventing soil pollution; ● Use designated areas for concrete washout and provide proper containment and disposal methods. Consider using environmentally friendly concrete additives.	● Existence and use of designated areas for chemical storage ● Existence and implementation of a spill prevention and response plan ● Construction team training records on soil and water pollution ● Designated areas for concrete washout	Contractor Proponent RE Contractor's Environmental Officer	Monthly Throughout construction period	N/A
	● Conduct water monitoring during and after construction	● Water monitoring reports	Contractor Proponent RE	Quarterly throughout the	300,000

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
				construction period	
Surface water contamination	• Preventing wet concrete and cement from entering watercourse; • Stockpiles to be kept away from watercourses; • Prepare a spill contingency response plan and procure appropriate equipment for oil and • fuel spill management; • Develop a water quality monitoring programme in collaboration with relevant lead agencies; and • Procure an oil spill response kit and build capacity of staff to respond effectively to potential oil spillages	• Implementation of measures to prevent wet concrete and cement from entering watercourses • Documentation of stockpile locations and their distance from watercourses • Existence and implementation of a spill contingency response plan and procurement and availability of an oil spill response kit • Existence and implementation of a spill	Contractor Proponent RE	Monthly Throughout construction period	100,000 to obtain spill kits for the four project areas

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		contingency response plan			
Solid Waste	● Provide clearly labeled bins for source separation of different types of waste (e.g., metal, wood, concrete) to encourage recycling; ● Train construction workers on the importance of source separation and proper disposal practices to minimize contamination; ● Develop and implement a comprehensive program for the reuse and recycling of construction waste materials, including concrete, wood, metal, and other recyclables ● Prioritize material efficiency and waste reduction by planning construction activities to minimize excess materials and packaging; ● Provision of toilet facilities for use by the contractor staff and other workers during construction and operation phases respectively. Provide portable sanitary conveniences for the construction workers for control of sewage waste. A ratio of approximately 25 workers per chemical toilet should be used;	● Existence of clearly labeled bins for different types of waste ● Implementation of training programs for construction workers ● Existence and implementation of a waste reuse and recycling program ● Existence and accessibility of toilet facilities for construction and operation phases ● Existence and implementation of a waste management plan	Contractor Proponent RE Contractor's Environmental Officer	Monthly Throughout construction period	1,000,000

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
	● Develop strategies (waste management plan) for management of specific waste streams prior to construction phase; ● Store hazardous wastes such as used oils and other chemicals in bunded areas away from watercourses.	● Documentation of storage areas for hazardous wastes.			
	● Design proper waste skips to avoid overflow ● Locate the waste management facility away from drainages and natural water sources ● Locate the waste with consideration of wind direction	● Proper design of the waste facility ● Appropriate waste facility location away from water sources and wind direction considerations	Design team	Once during design	Design costs
Air Pollution	● Use water spray systems to control dust at the active construction sites; ●	● Water consumption rates for dust suppression;	Contractor Proponent RE	Monthly Throughout construction period	3,000,000
	● Schedule high-dust activities during low-wind periods	● Reduction in visible dust levels in the air	Contractor Proponent RE		N/A
	● Provide workers with personal protective equipment (PPE) like dust masks	● Compliance with PPE usage among	Contractor Proponent RE	Monthly Throughout construction period	483,000

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		construction workers			
	● Display warning signs and implement traffic control measures.	● Visibility of warning signs to motorists and pedestrians	Contractor Proponent RE	Monthly Throughout construction period	500,000
	● Train construction workers on dust control measures and the use of personal protective equipment.	● Training records indicating topic trained attendance and participation rates	Contractor's Environmental Officer	Monthly Throughout construction period	100,000
	● Engage with the local community to provide information on the air quality impact challenges they are encountering and establish their mitigation measures.	● Feedback from the community on the effectiveness of dust suppression efforts	Contractor's Environmental Officer	Monthly Throughout construction period	70,000
	● Inform nearby residents and businesses about construction activities and potential dust impacts	● Communication to the public regarding the ongoing works;	Contractor's Environmental Officer	Monthly Throughout construction period	Covered under signage costs
	● Undertake regular dust monitoring (PM_{10} and $PM_{2.5}$) throughout the construction phase.	● Air quality measurements during high-	Contractor's Environmental Officer	Daily monitoring records	300,000

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		dust and low-wind periods ● Dust monitoring records.			
	● Implement dust control measures to minimize the visual impact of airborne particles generated during construction.	● Implementation of dust control measures to minimize airborne particles during construction	Contractor's Environmental Officer	Daily during construction	Included in dust suppression cost
Sedimentation (Soil Loss)	● Practice selective vegetation clearing where necessary; ● Schedule construction activities to avoid periods of heavy rainfall when the risk of runoff is higher; ● Cover soil stockpiles and construction materials on site and on transit to prevent wind and water erosion; ● Minimize the extent of grading and disturbance to natural terrain, preserving existing vegetation and soil structure. ● Use excavated soils for backfilling while carry away excess soil for appropriate disposal.	● Documentation of areas subject to selective clearing ● Adherence to construction schedules that avoid periods of heavy rainfall ● Compliance with guidelines for minimizing terrain disturbance ● Records of the use of excavated soils	Contractor Proponent RE Contractor's Environmental Officer	Monthly Throughout construction period	No additional cost

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
	• Carry out slope protection along the steep slopes to rehabilitate areas where excavation has taken place to prevent future collapse and erosion.	for backfilling and documentation of excess soil disposal practices			
Noise and Vibration	• Use equipment that is properly fitted with noise reduction devices such as mufflers;	• Installation and utilization of noise mufflers on machinery.	Contractor Proponent RE	Every time a new equipment is introduced	N/A
	• Use equipment that have low noise emissions as stated by the manufacturers;	• Documentation of equipment specifications regarding noise emissions	Contractor's Environmental Officer	Every time a new equipment is introduced	N/A
	• Workers should be provided with personal protective equipment;	• Availability and usage of personal protective equipment (PPE) among workers;	Contractor Proponent RE	Throughout construction period	Covered in PPE cost
	• The residents will be informed ahead of the commencement of works;	• Documentation of communication done with residents;	Contractor's Environmental Officer	Weekly Throughout construction period	150,000

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
	● Encourage the adoption of low noise technology and practice for machines during construction.	● Documentation of equipment specifications regarding noise emissions	Contractor Proponent RE Contractor's Environmental Officer	Throughout construction period	N/A
	● Limit operation for specific loud pieces of equipment or operations to daytime.	● Document indicating Adherence to designated construction hours.	Contractor's Environmental Officer	Throughout construction period	N/A
	● Require contractors to prepare and implement a Vehicle & Traffic Management Plan (VTMP).	● Existence and implementation of a Vehicle & Traffic Management Plan (VTMP)	Contractor Proponent RE Contractor's Environmental Officer	Monthly throughout construction period	200,000
	● Undertake noise monitoring at the construction sites	● Noise monitoring reports	Contractor's Environmental Officer	Daily, throughout construction period	200,000
	● Monitor the conditions of the structures along the construction corridors to ascertain their baseline conditions before construction begins.	● Regular inspection and observation of the structures	Contractor	Continuous during construction	Part of EHS performance monitoring

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		• Residents feedback			
Potential impact on traffic/ obstruction of temporary access	• Develop a comprehensive traffic management plan that includes measures to minimize congestion, regulate traffic flow, and ensure safe pedestrian movement; • Use clear and visible signage to inform the public about construction activities, detours, and expected delays. Communicate construction schedules in advance; • Schedule construction activities during off-peak hours to minimize disruption to normal commuting times; • Identify and promote alternative routes for motorists to bypass construction zones, reducing congestion on primary routes; • Provide safe and well-marked pedestrian walkways, ensuring that pedestrians can navigate around construction zones without compromising their safety; • Engage with the local community through the SEC committee to inform them about construction plans, potential traffic impacts, and	• Existence and implementation of a comprehensive traffic management plan • Implementation of clear and visible signage at construction sites • Adherence to construction schedules that prioritize off-peak hours • Identification and promotion of alternative routes to bypass construction zones • Existence and accessibility of safe and well-	Contractor Proponent RE	Weekly Throughout construction period	2,000,000

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
	mitigation measures. Solicit feedback and address concerns; • Plan construction activities in phases to minimize the extent of road closures and traffic disruptions at any given time; • Coordinate with emergency services to establish clear emergency access routes and ensure that construction activities do not impede their response.	marked pedestrian walkways around construction zones • Documentation of community awareness and feedback on traffic impacts • Coordination with emergency services to establish and maintain clear emergency access routes			
Health and Safety Impacts	• Provide comprehensive safety training for all workers, emphasizing hazard awareness, safe work practices, and emergency procedures.	• Existence and implementation of safety training programs	Contractor Proponent RE	Regular training on onboarding of new staff Throughout construction period	200,000 for every 25 committee members 120,000 for Fire Risk Training to all staff annually 100,000 for First aid training to all staff Annually

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
	● Ensure the use of appropriate PPE, such as hard hats, safety glasses, gloves, and respiratory protection.	● Implementation and use of appropriate personal protective equipment (PPE)	Contractor's Safety Officer	Daily inspection and supervision reports	Included in PPE provision costs Supervision included in Safety Officer's cost
	● Conduct regular inspections and audits to identify and address potential hazards on the construction site.	● Existence and implementation of regular inspection and audit programs	Contractor's Safety Officer		100,000 paid to the safety officer monthly to monitor; 150,000 Annual External HSE Auditor
	● Develop and communicate emergency response plans to address potential accidents or incidents promptly.	● Emergency response Plan ● Communication of emergency response plans through tool box talks ● Incidents and accidents records	Contractor's Safety Officer	Daily	Safety Officer Cost
	● Provide safe working tools to adhere to the ergonomic principles to minimize strain and prevent musculoskeletal disorders.	● Safe working tools provided ● Zero cases of ergonomic disorders during the	Contractor Proponent RE	Annually	Included in the medical examination costs

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		construction phase			
	• Promote overall worker well-being through wellness programs and initiatives addressing both physical and mental health.	• Existence and implementation of wellness programs addressing physical and mental health including fitness to work medical examination	Contractor	Annually	50,000
Drainage Impacts	• Designate emergency overflow routes or areas where excess water can be safely directed during heavy rainfall that will help to prevent flooding in critical areas by providing an alternative path for excess water; ▪ Develop and implement comprehensive storm water management plans that address the entire watershed; ▪ Assess and Implement early warning systems to provide timely alerts about potential flooding that could guide on construction timings; • Develop and enforce construction waste management practices to	• Identification and signage of designated overflow routes • Existence and implementation of a comprehensive storm water management plan • Implementation and functionality of early warning systems	Contractor Proponent RE	Monthly Throughout construction period	250,000

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
	prevent improper disposal of construction debris and materials into drainage channels.	• Documentation of construction waste management practices • Inspection reports indicating waste management practices			
Natural resource depletion	• Construction contract should stipulate that the Contractor sources materials from an approved site; • The tender documents should specify required standards and certification for procurement of all materials and appliances; • The sources of all required materials should be inspected prior to acquisition to confirm that they are legitimate operations; • The contractor should ensure that he sources construction materials sustainably; • The contractor should ensure that the storage area for materials is good so as to avoid spoils and waste;	• Inclusion of material sourcing requirements in the construction contract • Obtain relevant certifications and licenses at the material sourcing sites • Inclusion of required standards and certification details in tender documents	• Proponent procurement department Contractor procurement	Monthly Throughout construction period	Cost covered under material sourcing cost

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
	• Possibly invest in local capacity building to enhance the skills and capabilities of local craftsmen and suppliers, ensuring that they can meet project requirements; • Collaborate with local industries to develop and supply materials that meet project specifications, fostering a sustainable supply chain.	• Existence and implementation of material source inspection processes • Documentation of sustainable sourcing practices for construction materials • Existence and maintenance of proper storage areas for construction materials • Existence and implementation of collaboration with local industries			
	• Obtain permits and any relevant documentation on the construction sources of water	• Sources of construction water • Water abstraction	Contractor Proponent RE	Monthly	Water for dust suppression included in dust suppression cost

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		permits where relevant ● Records on the amount of water used on a daily basis to assess resource utilization ● Water bills			Construction water amount covered in construction cost Water abstraction permit covered in construction cost
SOCIAL IMPACTS					
Incidence of HIV/AIDS	● Implement comprehensive sexual education programs that cover safe sex practices, STD prevention, and the importance of consensual relationships. ● Ensure easy access to condoms and other forms of contraception to encourage safe sexual practices.	● Community education programme in place with the curriculum coverage; ● Availability and accessibility of condoms and contraceptives.	Contractor Proponent RE	Quarterly Throughout construction period	4,000,000
Ineffective Grievances redress mechanisms	● Grievances shall be addressed through the GRM document developed for KISIP II	● Existence of the grievance redress mechanism document	Proponent Contractor RE	Monthly Throughout construction period	200,000
GBV-Sexual Exploitation and Abuse	Undertake sensitization and training on gender-based violence	Trainings undertaken	Contractor	During recruitment	Contractor training cost

Construction Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
(SEA) of communities by project workers and Sexual Harassment (SH) amongst project workers					
Child Exploitation and Abuse	Undertake sensitization and training on child labour	Trainings undertaken	Contractor	During recruitment	Contractor training cost
Exclusion of disadvantaged and vulnerable groups e.g., PWDs, elderly, youth, the sick, the poor, single-women, OVC etc.	Ensure that all vulnerable persons benefit from the opportunities presented by the projects to be implemented. This will include the recruitment of casual laborers and also compensation of lost household assets and livelihood restoration interventions	Monitor the Grievance received	Contractor	Continuously	No additional cost
Inadequate stakeholder engagement	a stakeholder engagement plan has been prepared and will be implemented during all phases of the project	Stakeholder engagement reports	Proponent Contractor RE	Continuously	50,000

9.5. Operation Phase Environmental and Social Impacts Management and Monitoring Plan

Table 77: Operations Phase ESMMP

Operations Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
ENVIRONMENTAL IMPACTS					
Noise and air pollution during road maintenance	• Use efficient machinery and equipment during repairs and road maintenance if any • Sensitize maintenance personnel to switch off machinery when not in use	• Feedback from community • Noise monitoring reports	Contractor Proponent RE	Quarterly Throughout operations of the project	500,000
	• Undertake road repairs during the day	• Feedback from community			
Energy demand for the streetlights and high mast lights	• Use solar powered streetlights and floodlights • Enhance use of energy saving fittings/methods	• Energy consumption records-Annual Audit reports	Proponent RE	Annual	100,000
Possibility of flooding due to blocked drainage system	• Sensitize locals on importance of proper waste disposal • Install visible warning signs advertising fines for littering waste into the drainage system • Conduct regular inspection of the drainage system • Regularly remove trash and litter	• Number of Community sensitizations undertaken • Installed signages • Inspection records • Drainage cleaning/clearing schedule and records • Annual Audit reports	Proponent RE	Annual	200,000
SAFETY IMPACTS					
Possible vandalism and	• Employ security personnel or community watch programs;	• Presence of security	Proponent RE	Annual	200,000

Operations Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
theft of accessories	• Educate the community on the importance of infrastructure protection. • Engage local authorities and law enforcement in monitoring and preventing vandalism • Educate the community on the importance of infrastructure protection. • Engage local authorities and law enforcement in monitoring and preventing vandalism • Promptly repair any damage and strengthen preventive maintenance.	personnel or community watch programs at vulnerable sites • Develop an incident reporting system for immediate response to vandalism or theft • Community feedback on awareness and reported incidents of attempted vandalism • Incidents reported and actions taken by law enforcement in response to vandalism • Number of community education programs conducted			

Operations Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		• Records of reported damages and timelines for repairs			
Accidents from speeding vehicles	• Implement speed limits and enforce traffic regulations. • Install speed bumps or rumble strips where necessary • Display prominent road signs indicating speed limits.	• Number of reported speeding incidents and actions taken; • Inspection reports confirming the installation of speed bumps or rumble strips • Inspection reports confirming the installation of speed bumps or rumble strips	Proponent RE	Annual	200,000
Trips and fall into uncovered drainage	• Ensure the drainage system is covered especially near the pedestrian access areas • Ensure clear warning signage are displayed	• Drainage design • Annual audit report	Proponent RE	Annual	200,000
Dilapidated roads and vandalism	• Ensure proper drainage system is developed alongside the road	• Inspection reports	Proponent RE	Annual	200,000

Operations Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
	• Ensure timely renovation and effective maintenance of roads • Enforce fines to road use violators	• Road inspection and maintenance records • Road use laws and regulations			
Possibility of spread of waterborne diseases from contaminated piped water	• Regularly test and monitor water quality from public watering points for waterborne pathogens • Educate the public on safe water practices • Implement water treatment measures as needed	• Frequency of water quality testing specifically for waterborne pathogens • Documentation of water treatment measures implemented based on testing results	Proponent RE	Annual	500,000
Destruction of roads and amenities from riots and demonstrations	• Conduct awareness campaigns on the importance of the infrastructure and its impact on the community. • Communicate the potential consequences of destructive actions during riots and demonstrations; • Familiarize project stakeholders with legal consequences for engaging in destructive actions; • Collaborate with local authorities to enforce legal measures against those involved in vandalism.	• Documentation of sessions or materials used to familiarize stakeholders with legal consequences • Community feedback on their understanding of the infrastructure's	Proponent RE	Annual	200,000

Operations Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		importance and impact • Records of collaboration with local authorities for legal enforcement • Number of legal actions taken against individuals involved in vandalism			
SOCIAL IMPACTS					
Possibility of encroachment along the access road	• Sensitize locals on penalties associated with encroachment to road reserves	• Coming up with policies and regulating laws	Proponent RE	Annual	200,000
Maintenance cost	• Use quality material during the construction phase to reduce cost of maintenance • Engage local communities in road maintenance efforts to foster a sense of ownership and responsibility • Train and sensitize maintenance staff on effective technologies • Conduct regular maintenance and inspection of the road	• Records of quality of materials used • Contracts issues to local for road maintenance • Training records • Inspection reports	Proponent RE	Annual	200,000

Operations Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
Inadequate stakeholder Engagement Exclusion of disadvantaged and vulnerable groups	• Engage stakeholders and share project information widely and in a timely manner through diverse, feasible and accessible channels of communication e.g., public forums.	• Number of Vulnerable and disadvantaged groups mapped in each of the settlements. • Minutes of all meetings held with disadvantaged groups.	Proponent RE	Annual	N/A
Ineffective Grievance Management	• Log, date, process, resolve, and close out all reported grievances are in a timely manner.	• Number of nature of cases received and logged (updated GR logs/register). • Number and type of pending grievances. • Number of GRC meetings conducted and grievances resolved in the GRC meetings. • Number and type of facilitations done for the SEC/GRC to	Proponent RE	Annual	200,000

Operations Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Monitoring Frequency	Estimated Cost (KES)
		solve community Grievances. • Number of grievances resolved in a timely manner. • Number of grievances escalated to national courts and the World Bank Grievances Redress Service and Inspection Panel.			

9.6. Decommissioning Phase EMMP

Decommissioning refers to the formal process of bringing to an end. As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased.

This EMP should be treated as a guiding document that will be employed in the initial stages of the decommissioning. Detailed procedures will be developed with the cause of decommissioning in mind by competent persons and agencies. Table 78 below presents the EMP of the decommissioning phase for the proposed project.

Table 78: Decommissioning Phase ESMMP

Decommissioning Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsible party	Time Frame	Cost (Ksh)
ENVIRONMENTAL IMPACTS					
Demolition waste	• Adopt an integrated solid waste management system i.e. through a hierarchy of options: Source reduction; Recycling; Reuse; Sanitary land filling.	• Integrated waste management system • Inspection report	Contractor Proponent RE	One-off	Part of construction cost
	• All structures and partitions that will not be used for other purposes must be removed and	• Structure tracking records	Contractor Proponent RE	One-off	Part of construction cost

Decommissioning Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsible party	Time Frame	Cost (Ksh)
	recycled/reused as far as possible.				
	● All foundations must be removed and recycled, reused or disposed of at a licensed disposal site.	● Tracking records	Contractor Proponent RE	One-off	Part of construction cost
	● Where recycling/reuse is not possible, the materials should be taken to a licensed waste disposal site.	● Waste tracking records	Contractor Proponent RE	One-off	Part of construction cost
Rehabilitation of project site	● Implement an appropriate re-vegetation programme to restore the site to its original status.	● Re-vegetating programme	Contractor Proponent RE	One-off	200,000
	● Consider use of indigenous plant species in re-vegetation.				
Increased occupational health and safety risks	● Adherence to the Occupational Health and Safety Rules and Regulations stipulated in the Occupational Safety and Health Act, 2007.	● Occupational Health and Safety Audit report during Decommissioning	Contractor Proponent RE	One-off	200,000
	● Provision of appropriate personal protective equipment as well as ensuring a safe and				

Decommissioning Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsible party	Time Frame	Cost (Ksh)
	healthy environment for demolition workers. ● Mitigate demolition workers accidents by enforcing adherence to safety procedures and preparing contingency plan for accident response.				
Noise and Vibration	● Sensitize demolition vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used.	● Training records	Contractor Proponent RE	Weekly During decommissioning	N/A
	● Sensitize demolition drivers to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as churches, offices, hospitals, residential houses and schools.	● Training records	Contractor Proponent RE	Weekly During decommissioning	N/A
	● Ensure that demolition machinery is kept in good condition to reduce noise and vibration generation.	● Inspection records	Contractor Proponent RE	Weekly During decommissioning	N/A

Decommissioning Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsible party	Time Frame	Cost (Ksh)
	• Ensure that all generators and other equipment used are insulated or placed in enclosures.	• Inspection records	Contractor Proponent RE	Weekly During decommissioning	N/A
	• The noisy construction works will be planned to be during the day.	• Inspection records	Contractor Proponent RE	Weekly During decommissioning	N/A
SOCIAL IMPACTS					
Local Employment	• Prioritize hire of locals for all unskilled labour. • Implement 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. • Adhere to labour laws, and labour management practices (timely renumeration, equitable compensation for both genders for equal work etc.)	• Fair and transparent local recruitment plan in place. • Recruitment processes (job adverts, interviews, selection etc.). • Number of locals employed based on gender, vulnerability, ethnic group, clan etc. • Type of employment (skilled, semi-skilled and unskilled). • Grievances raised, those aggrieved, status of resolution.	Contractor Proponent RE	One-off	200,000

Decommissioning Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsible party	Time Frame	Cost (Ksh)
	• Create awareness to workers and the community on worker and project grievance redress mechanisms.				
Local Sourcing	• Source materials from local businesses/communities. • As applicable, give opportunities to businesses owned or operated by vulnerable individuals.	• Number and types of businesses sourced from. • Number and types of businesses owned and operated by vulnerable individuals.	Contractor Proponent RE	One-off	Procurement cost
Inadequate stakeholder Engagement Exclusion of disadvantaged and vulnerable groups	• 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	• Number of Vulnerable and disadvantaged groups mapped in each of the settlements. • Minutes of all meetings held with disadvantaged/vulnerable groups.	Contractor Proponent RE	One-off	200,000

Decommissioning Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsible party	Time Frame	Cost (Ksh)
	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	• 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	• Local Grievances Committee in place, composition of committee. • Number of nature of cases received and logged (updated GR logs/register). • Number and type of pending grievances. • Number of GRC meetings conducted and grievances resolved in the GRC meetings. • Number and type of facilitations done for the SEC/GRC to solve community Grievances. • Awareness of community and workers on project and worker GRMs.	Contractor Proponent RE	One-off	N/A

Decommissioning Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsible party	Time Frame	Cost (Ksh)
	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.	• Number of grievances resolved in a timely manner. • Number of grievances escalated to national courts and the World Bank Grievances Redress Service and Inspection Panel.			
Gender-Based Violence Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	• Develop and implement a policy on 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. • Ensure all those with physical presence on site sign and understand the Code of Conduct. • Put in place measures for monitoring GBV/sexual harassment.	• Number of Inductions sessions on SEA/SH. and signing of Code of Conducts. • Signed Code of Conducts. • Number of, SEA and SH cases reported and resolved. • Number of Community sensitization sessions on SEA and SH. • Number of Continuous training and awareness training done through toolbox talks. • Number of IEC materials done to create awareness. • Number of stakeholder engagements conducted on GBV/SEA/SH.	Contractor Proponent RE	One-off	N/A

Decommissioning Phase Environmental Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsible party	Time Frame	Cost (Ksh)
		• Establishment of a grievance responsive GRM.			
Child Exploitation and Abuse	• 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."	• Records of Child protection cases reported in the project. • Develop a child protection Code of Conduct. • Number of Inductions sessions on Child protection Code of Conducts. • Number of refresher awareness training on Child protection Code of Conducts. • Number of staff who have signed Code of Conduct.	Contractor Proponent RE	One-off	N/A

CHAPTER TEN

10.CONCLUSION AND RECOMMENDATIONS

10.1. Conclusion

Trans-Nzoia KISIP 2 projects identified in collaboration with the community, prioritize essential elements such as roads, drainage systems, sanitation, and street lighting. Following a thorough screening, various methods were used in impact identification, prediction, evaluation and analysis. Taking into account factors like project location, design, available alternatives, regulatory compliance, and community feedback, the ESIA assessment identified that the proposed project will have both positive and attendant negative impacts during its implementation phase. For each potential impact, the study determined its likelihood and consequence and recommended mitigation measures to enhance the positive impacts and minimize magnitude of the negative.

Some of the project positive impacts highlighted in the study are creation of employment opportunities, development of area due to improved road infrastructure, enhanced visibility and security within the area, reduced flooding and damaging of the infrastructures. On the other hand, the negative impacts include air and noise pollution, occupational safety and health risks, storm water blockage causing flooding, possible vandalism and theft and displacement of people.

During the survey, only two (2) PAPs were recorded to be along the road construction corridor and will be resettled as per the RAP report recommendations.

10.2. Recommendations

The contractor will prepare the following social management plans:

- ✓ *Labour Management Plan,*
- ✓ *Child Protection Strategy,*
- ✓ *Gender-based Violence Action Plan,*
- ✓ *Waste Management Plan,*
- ✓ *Contractors Code of Conduct,*
- ✓ *Gender Inclusivity Strategy,*
- ✓ *HIV/Aid Prevention Strategy.*

The contractors will be required to engage services of a qualified Environment, Health and Safety Officers and Social Safeguards Officer at the time of Project implementation.

At Project implementation stage, the contractor with approval of the supervising engineer will prepare periodic Environmental and Social Implementation Report. The reports will provide status of implementation of risks & impacts management measures to date from the project start to the end of the reporting period.

From an Occupational Health and Safety approach, the contractors will ensure they undergo the following;

- OSH risk assessment, Registration of workplaces, Safety and Health (OSH) Audit, Fitness to work assessment of employees,
- Training of all workers or workers' representatives in basic Occupational Safety and Health, Accident and incident reporting, Compensation of injured workers who die or get injured and disabled and

At Project completion stage, within the Defects Liability Period, Elgeyo Marakwet County Government will initiate an Initial Environment and Social Audit for the Project as required by EIA/EA Audit Regulations of the year 2003 amended in 2019 and subsequent annual self-audits. The Audit will develop an Environment and Social Audit Action Plan (ESAAP) that will be used to track Project Environment and Social Compliance during Operations Stage

i. All unforeseen social impacts which will result from displacement of project affected persons during project construction phase will be addressed as per the provisions of RPF
ii. Grievance redress system should be made -GBV responsive before commencement of works
iii. Project workers should have a transparent, open, available and anonymous GRMs for lodging grievances which should be solve in a timely manner
iv. Issues of climate smart interventions and gender should be given a priority during the entire project life cycle

The main recommendation of this ESIA is the need for concerted implementation of the EMP and Monitoring Plans by the proponent. These recommendations include;

i. Develop an ESMMP implementation action plan
ii. Develop the traffic management plans that will be used during the construction phase Development of an ESMMP implementation action plan prior to construction
iii. Provide adequate notice to the public on the areas to be cleared
iv. Develop the Implement the traffic management plans that will be used during the construction phase
v. Obtain all the required construction and operational permits before commencement
vi. Develop the Health and Safety management plans
vii. The contractor should comply with the approved designs and implement ESMP developed by the consultant
viii. Include the proposed mitigations in the tender contract and tender documents so that the contractor who will be selected for the project will be bound to implement them.

On the basis of a commitment by the proponent to implement the proposed measures to mitigate the potential negative environmental, safety, health and social impacts associated with the life cycle of the proposed project. it is within our expert opinion that the project be issued an EIA License as per the Environmental Management and Coordination Act Cap. 387 of the Laws of Kenya.

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24. Operational Manual - OP 4.11: Physical Cultural Resources, Revised 2006 by World Bank
25. Operational Manual World Bank Access to Information Policy, 2015

26. Physical and Land Use Planning Act, 2019
27. Project Appraisal Document (PAD) for KISIP, 2020 by MLPWHUD State Department for Housing and Urban Development, Kenya
28. Republic of Kenya Land Act, 2012
29. Republic of Kenya Public Health Act (Cap.242) by the National Council for Law Reporting
30. Republic of Kenya Sessional Paper No. 3 of 2016 on National Housing Policy
31. Republic of Kenya Sessional Paper No. 6 of 1999 on Environment and Development
32. Republic of Kenya Urban Areas and Cities Act 2011 by the National Council for Law Reporting
33. Republic of Kenya, Environmental (Impact Assessment and Audit) Regulations, 2003
34. Republic of Kenya, Environmental Coordination and Management Act (Water Quality) Regulations, 2006.
35. Republic of Kenya, Environmental Coordination and Management Act (Air Quality) Regulations, 2014.
36. Republic of Kenya, Environmental Management and Coordination (Amendment) Act 2015
37. Resettlement Policy Framework (RPF) 2019 for KISIP II by MLPWHUD State Department for Housing and Urban Development, Kenya
38. Sessional Paper No. 3 of 2009 on National Land Policy, Ministry of Lands Kenya
39. Special issue, Kenya gazette supplement No. 62, Legislative supplement No. 16, Legal notice No 31, The Environmental Management Coordination Act (EMCA), no 8 of 1999
40. Stakeholder Engagement Framework (SEF), 2019 for KISIP II by MLPWHUD State Department for Housing and Urban Development, Kenya
41. The Climate Change (Amendment) Act, 2023
42. The Sustainable Development Goals (SDGs)
43. Elgeyo Marakwet County Integrated Development Plan 2023-2027 by County Government of Elgeyo Mrakwet.
44. Water Act, 2016 Republic of Kenya
45. World Bank Group Environment Health and Safety Guidelines on Water and Sanitation
46. World Bank Group Environment, General Health and Safety Guidelines

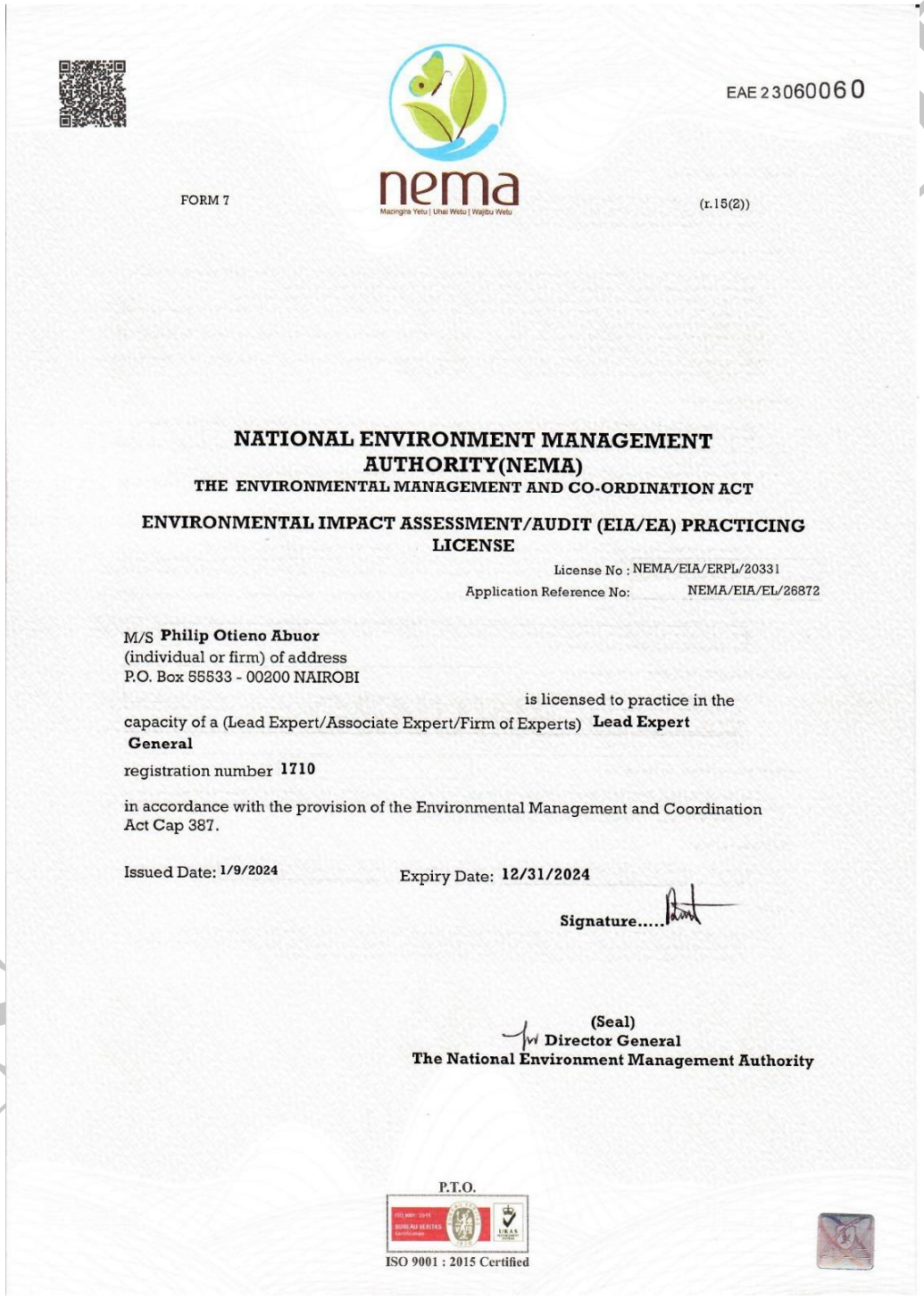
12.APPENDICES

12.1. Appendix I: Project Team

NAME	Role	Qualifications
Philip Abuor	Teal Leader	Lead EIA Expert/MSC Environmental Science
Dr. Dan Adino	Sociologist	PhD in Sociology
Eva Illa	Assistant Expert	Bachelor of Environmental Studies and Community Development

The following Experts have been Authenticated and their certificates presented below:

12.2. Appendix II: Expert NEMA Licenses



EAE 23060060

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/20331

Application Reference No: NEMA/EIA/EL/26872

M/S **Philip Otieno Abuor**
(individual or firm) of address
P.O. Box 55533 - 00200 NAIROBI

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

registration number **1710**

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

Issued Date: **1/9/2024** Expiry Date: **12/31/2024**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001 : 2015 Certified

13.ANNEXES

13.1. ANNEX I: Baseline Assessment reports

a) Water Quality

b) Noise Monitoring

c) Air Quality Report

13.2. ANNEX II: Bill of Quantities

13.3. ANNEX III: Abbreviated RAP Report

13.4. ANNEX IV: Social Screening Checklist

13.5. ANNEX V: Environmental Screening Checklist

13.6. ANNEX VI: Focus Group Discussion Guide

13.7. ANNEX VII: Socio economic survey tool

13.8. ANNEX VIII: Minutes of the community meetings held

13.9. ANNEX IX: List of participants of community participation meetings

13.10. ANNEX X: Asset inventory of the PAP

13.11. ANNEX XI: List of SEC members

13.12. ANNEX XII: Land Ownership Document