ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT STUDY FOR THE PROPOSED REHABILITATION OF 465KM LONGONOT-MALABA METRE GAUGE RAILWAY (MGR) BY KENYA RAILWAYS CORPORATION TRAVERSING THROUGH NAKURU, BARINGO, UASIN GISHU, KAKAMEGA, BUNGOMA AND BUSIA COUNTIES

This Environmental and Social Impact Assessment report is submitted to the National Environment Management Authority (NEMA) in pursuant to the requirements of the Environment Management and Coordination Act, 1999 and the Environmental (Impact Assessment and Audit) Regulations, 2003

PROJECT PROPONENT:

KENYA RAILWAYS CORPORATION

P.O. Box 30121-00100
Nairobi-Kenya

EIA LEAD EXPERTS:

Naftal Moibi Miregwa: NEMA Reg. EIA/ EA Lead Expert (2110)

Stellah Ndiwa: (NEMA Reg. EIA/ EA Lead Expert 10011)

Version: Final Report

October 2021

CERTICIFICATION

Certification by Lead Experts

We hereby certify that this Environmental and Social Impact Assessment (ESIA) study report has been prepared under our supervision and the assessment criteria, methodology and content reporting conform to the requirements of the Environmental Management and Coordination Act Cap. 387 of the Laws of Kenya.

Name: **Naftal Miregwa** (2110)
Email Address: nmiregwa2@gmail.com
Address: P.O. Box 30121-00100,
NAIROBI

Signature.....Date.....14/10/2021.....

Name: **Stellah Ndiwa** (10011)
Email Address: ndiwastellah@gmail.com
Address: 30121-00100
NAIROBI

Signature.....Date.....21/10/2021.....

Certification by Proponent

We, **Kenya Railways** confirm that this Environmental and Social Impact Assessment (ESIA) study report for the rehabilitation of Kenya Railways infrastructure has been prepared and submitted to NEMA with our authority as the proponent.

Signed for and on behalf of: **Kenya Railways**

Name: .....ENG. JOHN MAINA.....

Designation: .....PLANNING, DESIGN & ENVIRONMENT MANAGER

Signature:.....Date.....21/10/2024.....

Proponent Contact Details

Kenya Railways

P.O. Box 30121-00100

NAIROBI

Official Rubberstamp

INFRASTRUCTURE DEVELOPMENT DEPARTMENT
KENYA RAILWAYS CORPORATION

LIST OF ACRONYMS

ACMs	Asbestos Containing Materials
CEMP	Construction Environmental Management Plan
CoK	Constitution ok Kenya
COVID-19	Corona Virus Disease 2019
CSR	Corporate Social Responsibility
EA	Environmental Audit
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
EMCA	Environmental Management and Coordination Act
GoK	Government of Kenya
GHG	Green House Gases
GPS	Global Positioning System
HSE	Health, Safety And Environmental
HIV/AIDs	Human immunodeficiency virus infection and Acquired Immune Deficiency Syndrome
KES	Kenya Shillings
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KNBS	Kenya National Bureau of Statistics
KPC	Kenya Pipeline Corporation
KPHC	Kenya Population and Housing Census
KISIP	Kenya Informal Settlement Improvement Projects
KR	Kenya Railways
KURRA	Kenya Urban Roads Authority
KWS	Kenya Wildlife Service
MSDS	Material Safety Data Sheet
NCPB	National Cereals and Produce Board
NEMA	National Environment Management Authority
PM	Particulate Matter
PPE	Personal Protective Equipment
SOE	State of Environment
SPRP	Spill Prevention & Response Plan
TOR	Terms of Reference
WHO	World Health Organization
WRMA	Water Resources Management Authority

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NON TECHNICAL SUMMARY

General overview

The proponent, Kenya Railways (KR) proposes to rehabilitate 465Km of the Meter Gauge Railway line from Longonot –Malaba to facilitate for safe and efficient operation of this line and a seamless movement and transfer of cargo from Naivasha Inland Container Depot. The Longonot –Malaba MGR section railway line rehabilitation is located at the Rift Valley and western Kenya traversing various Counties including Nakuru, Baringo, Uasin Gishu, Kakamega, Bungoma and Busia County. The main material inputs will include sand, ballast, cement, steel and stones.

Rail transport is the second most important mode of transport in Kenya, after road transport, for both freight and passenger services. The railroad system in Kenya consists of the national railway network transport and the metropolitan network. The Economic recovery strategy for wealth and employment creation identified the transport sector as the third pillar of Kenya's economic recovery. The railway system is under the parastatal management of Kenya Railways (KR) and comprises 2,765 km of track. In addition to provision of freight services within the country, KR also handles transit traffic to and from the landlocked countries in the East African region.

The railway network has 2,350 route-km of a meter gauge track of which 23 percent is of the 95lb rail type, 39 percent is of the 80lb rail type and 38 percent is of the 50lb rail type. About 1,421 km of the railway network form the main line of which 1,182 is in Kenya. Most of the railway network was constructed more than 100 years ago. The lack of investment in the rail network combined with vandalism has seen serious deterioration of track and train control systems. This has resulted in low train operating speeds and capacity restraints. The branch lines are the Nakuru-Kisumu and Nairobi-Nanyuki railway lines, while the minor branch lines consist of Voi-Taveta, Gilgil-Nyahururu, Rongai-Solai and Leseru-Kitale. These were built primarily to serve the former white highlands. KR operates a meter gauge (1000 mm) system built in the late nineteenth and early twentieth centuries

This proposed rehabilitation of Railways infrastructure will play a major role to provide public rail transport along the Nairobi –Malaba line through the rehabilitation of the existing Longonot -Malaba MGR Main line which is 465Km long. This is an important measure for improving Kenyan transportation network, and an important means to optimally improve the meter gauge railway operations.

Implementation of the KR Infrastructures rehabilitation project is expected to raise a number of environmental and social concerns that are both negative and positive to the surrounding environment and local communities. Kenya Railways ,commissioned this Environmental Impact Assessment (EIA) study to determine the likely impacts of the proposed development on the environment and local communities and advice on mitigation measures that need to be undertaken to address adverse negative impacts.

The ESIA Study

Pursuant to such works and as stipulated in the Environmental Management and Coordination Act, 1999 the Proponent is required to carry out an Environmental and Social Impact Assessment (ESIA) study to determine the adverse impacts the project would have on the environment and propose mitigation measures to eliminate or reduce the magnitude of these impacts.The ESIA Study aims to:

- Identify and examine in detail likely adverse environmental and social impacts directly and / or indirectly attributable to this project
- Appropriate mitigation measures for the identified impacts.
- Equip stakeholders with tools for making informed decisions about key impacts expected to emanate from the project
- Establish environmental and associated baselines for future monitoring purposes.

The ESIA Study includes a full on-site field assessment to characterize the ecological resources present with particular reference to identification of environmentally sensitive areas or species. The possibility of adverse impacts resulting from the implementation of the proposed development was assessed with respect to fauna and flora and other ecological resources associated with the site. In addition project impacts on public health and safety was assessed.

Public consultation was done through administration of questionnaires. The questionnaires were administered randomly in areas where the projects influence. A number of issues were raised by the public and key stakeholders consulted. Public consultative meetings were held as per the table 1 below. (Copy of minutes and attendance list attached in annex 2).

Table 1: Stakeholder Engagement Meeting venue and dates

No	Area/ Location	Venue	Date	Time
1.	Longonot	Chiefs Camp office	24/08/2021	10:00hrs
2.	Gilgil	Gilgil Railway Station	25/08/2021	09:00hrs
3	Nakuru	Nakuru Locoshed	27/08/2021	11:00hrs
4	Eldoret	Eldoret Railway Station	29/08/2021	14:00Hrs
5	Bungoma	Bungoma Railway Station	31/08/2021	14:00hrs
6	Malaba	Malaba Railway Station	01/09/2021	09:00hrs

This ESIA study report proposes necessary mitigation measures that will greatly reduce or prevent environmental damage that would be caused by the project's activities and outlines an Environment Management Plan (EMP) to ensure compliance with the proposed measures.

TERMS OF REFERENCE FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

The following Terms of Reference for the Environmental and Social Impact Assessment (ESIA) of the proposed project were adapted in accordance with the NEMA environmental impact assessment guidelines.

1. Introduction – The Experts would identify the development project to be assessed and explain the executing arrangements for the environmental assessment. This chapter would detail the rationale for the development and its objectives.
2. Background Information – The Experts would highlight the major components of the proposed project, the implementing agents, a brief history of the project and its current status including a justification why the project is necessary.
3. Study Area – Specification would be made of the boundaries of the study area as well as any adjacent or remote areas considered to be affected by the project
4. Description of the Proposed Project - a full description of the relevant parts of the project, using maps at appropriate scales where necessary, activities, technology, procedures and processes, materials to be used, Products, by-products and waste generated, during the project construction, operation and de-commissioning phases
5. Description of the Environment - Evaluate and present baseline data conditions on the relevant environmental characteristics of the study area (and disposal sites), including the following:
    a) Physical environment: geomorphology, meteorology (rainfall, wind), water quality, and ambient noise.
    b) Biological environment: terrestrial vegetation and fauna, rare or endangered species, wetlands, coral reefs, and other sensitive habitats, species of commercial importance and endangered species.
    c) Socio-cultural environment: shipping and fishing activities and use of the port, population, land use, planned development activities, employment, recreation and public health, community perception of the development, vulnerable occupants

    The Experts would analyze the extent and quality of the available data, indicating significant information deficiencies and any uncertainties associated with the prediction of impacts.
6. Legislative and Regulatory Considerations – A description of the applicable legislation, regulations would be outlined as well as environmental policies that are relevant and applicable to the proposed project.
7. Identification of the Potential Impacts of the Proposed Project – Identification of impacts related to rehabilitation of KRs infrastructure, fencing of Railway Stations, Asbestos removal, rehabilitation of railway stations .i.e. Longonot, Munyu, Gilgil, Nakuru, Menengai, Rongai, Visoi, Maji Mazuri, Makutano, Equator, Timboroa, Ainabkoi, Tumeiyo, Kipkabus, Kaptagat, Plateau, Eldoret, Turbo, Kipkaren, Lugari,

Webuye, Bungoma, Myanga and Malaba.

8. Special attention would be paid to:
   a) Effects of the project on water quality and existing rivers and sensitive ecosystems and resources,
   b) Effects of the project on road traffic,
   c) Effects of the project on ambient noise levels
9. Analysis of Alternatives to the Proposed Project – A Description of the alternatives will be examined for the proposed project that would achieve the same objective including the "no action" alternative. The most environmentally friendly alternatives would be identified and proposed for implementation
10. Mitigation of Negative Impacts – The Experts will identify possible measures to prevent or reduce significant negative impacts to acceptable levels
11. Development of a Monitoring Plan – Identify the critical issues requiring monitoring to ensure compliance with mitigation measures and present impact management and monitoring plan for such issues.
12. Public Participation and Consultation - The experts would identify appropriate mechanisms for providing information on project activities and progress of project to stakeholders, assist in co-coordinating the environmental assessment with the relevant government agencies and in obtaining the views of local stakeholders and affected groups.
13. Report Preparation - The environmental and social impact assessment report, to be presented in electronic and hard copies, contains the findings, conclusions and recommended actions supported by summaries of the data collected and citations for any references used in interpreting those data. The report will be prepared in the format prescribed by NEMA.

Findings of the ESIA Study

During the site visits and reconnaissance survey, the following key findings were identified:

(i) Most of the buildings are dilapidated, with some missing window panes and broken/ missing roofing tiles

(ii) Dilapidated sanitary facilities with no water connection at most of the stations

(iii) Asbestos Containing Materials were noted on site, at Nakuru Railway Station, Nakuru Locoshed and bicycle shed, Kipkabus, Sosian, Eldoret CXR, Malaba CXR,

(iv) High vegetation noted along the railway line

(v) No enough ballast on the railway line

(vi) Absence of security fence in various areas around station yards

(vii) Absence of running water at Nakuru station, including proper lavatories on site

(viii) High risk level crossings at Nakuru, Eldoret and Bungoma

(ix) No new land acquisition will be done

(x) Effluent discharge flowing from Bungoma GK prison

(xi) Rumoro Solid waste disposal site for Bungoma town being operated by County Government of Bungoma

1. INTRODUCTION

1.1. Background

The proponent, Kenya Railways (KR) proposes to rehabilitate of the 465Km Longonot – Malaba MGR section to facilitate safe and efficient operation of this line. The Longonot – Malaba MGR section railway line rehabilitation is located at the Rift Valley and western Kenya traversing various Counties including Nakuru, Baringo, Uasin Gishu, Kakamega, Bungoma and Busia County. The main material inputs will include sand, ballast, cement, steel and stones.

Rail transport is the second most important mode of transport in Kenya, after road transport, for both freight and passenger services. The railroad system in Kenya consists of the national railway network transport and the metropolitan network. The Economic recovery strategy for wealth and employment creation identified the transport sector as the third pillar of Kenya's economic recovery. The railway system is under the parastatal management of Kenya Railways (KR) and comprises 2,765 km of track. In addition to provision of freight services within the country, KR also handles transit traffic to and from the landlocked countries in the East African region.

The railway network has 2,350 route-km of a meter gauge track of which 23 percent is of the 95lb rail type, 39 percent is of the 80lb rail type and 38 percent is of the 50lb rail type. About 1,421 km of the railway network form the main line of which 1,182 is in Kenya. Most of the railway network was constructed more than 100 years ago. The lack of investment in the rail network combined with vandalism has seen serious deterioration of track and train control systems. This has resulted in low train operating speeds and capacity restraints. The branch lines are the Nakuru-Kisumu and Nairobi-Nanyuki railway lines, while the minor branch lines consist of Voi-Taveta, Gilgil-Nyahururu, Rongai-Solai and Leseru-Kitale. These were built primarily to serve the former white highlands. KR operates a meter gauge (1000 mm) system built in the late nineteenth and early twentieth century's.

This proposed rehabilitation of Railways infrastructure will play a major role to provide public rail transport along the Nairobi –Malaba line through the rehabilitation of the existing Longonot -Malaba MGR Main line which is 465Km long. This is an important measure for improving Kenyan transportation network, and an important means to optimally improve the meter gauge railway operations.

Implementation of the KR Infrastructures rehabilitation project is expected to raise a number of environmental and social concerns that are both negative and positive to the surrounding environment and local communities. Kenya Railways commissioned this Environmental and Social Impact Assessment (ESIA) study to determine the likely impacts of the proposed development on the environment and local communities and advice on mitigation measures that need to be undertaken to address adverse negative impacts.

1.2. Scoping

The scoping process was carried out with a view to identifying key issues and to help focus available resources on the issues. The first step was to identify all interested parties relevant to the project. The second step was to develop information on the resource to be affected, potential concerns and project alternatives. The scoping process involved:

- Discussions with the proponent and consultation with relevant officials in the regulatory Authorities,
- Verbal interviews with key project beneficiaries and key stakeholders.
- Physical investigation of the site and the surrounding areas using a checklist with a view to identify potential environmental, social and safety issues that pertain to the project.
- Documentary review of the nature of the proposed activities, relevant legal and regulatory framework

1.3. The ESIA Study

1.3.1. ESIA Terms of Reference

In accordance with the Terms of Reference, the following scope has been defined for this ESIA.

- Clear description of the physical location and linkages of the project including the baseline conditions of the project area;
- A description of the project characteristics including project objectives, project design, activities, technology, procedures and processes, materials to be used, Products, by-products and waste generated, during the project construction, operation and de-commissioning phases;
- A description of the national environmental legislative and regulatory framework, baseline information and any other relevant information related to the project;
- Description of the recipient environment (baseline environment and social setting of the project area and the water railway line corridor),
- The potential environmental effect of the project, including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated;
- Project alternative analysis including locations, technologies or process available, analysis of alternatives, and reasons for preferring the proposed option;
- An environmental management and monitoring plan outlaying the activities, associated impacts, mitigation measures, monitorable indicators, implementation timeframes, responsibilities, and cost;
- An Action Plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities or major industrial and other development projects:
- Measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies;

Conclusions, recommendations and identification of gaps and uncertainties which were encountered in compiling the report

1.4. ESIA Objectives and Scope of Work

The ESIA report should be in line with the Environmental Impact Assessment and Audit Regulations of June 2003 established under Environmental and Management and Coordination Act (EMCA), 1999. The objective of the study is to carry out an Environmental and Social Impact Assessment for the rehabilitation of Railways infrastructure along the Longonot –Malaba line which is 465Km long. This is an important measure for improving Kenyan transportation network, and an important means to optimally improve the meter gauge railway operations for Kenya Railways traversing through Nakuru, Baringo, Uasin Gishu, Kakamega, Bungoma and Busia Counties. In accordance with the ESIA regulations, therefore, the objectives of the study should include the following key issues;

i. A clear description of the proposed project including its objectives, design concepts, proposed rehabilitation process and anticipated environmental and social impacts,
ii. Description of the baseline conditions in the project areas such as to cover the physical location, environmental setting, social and economic issues,
iii. A description of the legal, policy and institutional framework within which the proposed rehabilitation project will be implemented,
iv. Description of the project alternatives and selection criteria,
v. Details of the anticipated impacts to the environment, social and economic aspects of the area covered by the project. This include cumulative impacts associated with other projects in the areas associated with the project,
vi. Appropriate mitigation and/or corrective measures,
vii. Develop an environmental management plan (EMP) presenting the project activities, potential impacts, mitigation actions, targets and responsibilities, associated costs and monitoring indicators

The scope of the Environmental and Social Impact Assessment (ESIA) was to develop suitable recommendations to be integrated in the project design and implementation for mitigation of anticipated adverse impacts to the environment and social setting the project and service areas. An evaluation of public opinions and stakeholders attitude towards the project was captured through interviews and consultative forums conducted throughout the project area variously during the study period.

1.5. ESIA Methodology Approach

This approach was defined to identify impacts resulting from the proposed project to be determined on the basis of the baseline conditions established during the field work and information obtained from the documents reviewed. Detailed evaluation of the project area was undertaken to focus on any significant environmental issues. The communities living within the Railway line corridor area were interviewed during consultation and participation process during the detailed study process. Among the tools used included questionnaires, self writing forms, photographs, focus Group Discussions, etc. Overall, the study was undertaken through the stages below;

1.5.1. Scoping Process

This process was designed to provide a preliminary view of the environmental and social status. It involved establishment of the diversity on physical environment, climatic conditions,

demographic trends as well as the hydro-geological status in the area. Relevant policy and legal requirements were listed. This enabled determination of project elements that would be emphasized on. Among the aspects identified and that have been discussed in detail under this report included;

Environmental aspects

(i) The related ecosystems (vegetation species and habitats for organisms and breeding areas),
(ii) Excavation of biomass accumulated over years,
(iii) Water quality
(iv) Emergence of new alien species in the area such as to include vectors, wild animals and plant species,
(v) Effects on micro climatic conditions in the neighbouring areas,

Social and Economic

(i) Land issues with respect to encroachment
(ii) Social linkages of the railway line such as to include public health (HIV/AIDS, level crossing collisions, etc.), income generation (employment, business, farming, etc.) and access to transport and other social facilities and amenities,
(iii) Economic values of existing natural resources (biomass, sand, soils, stones, etc.),

Hydrology

(i) Daily rainfall data;
(ii) Daily Evaporation data;
(iii) Wind speed and direction;
(iv) Other climatic parameters (humidity, temperature), etc.

Ecological Aspects

A comprehensive review, field analysis, documentation and collation of existing and relevant literature or reports was done to help gain a clear and detailed understanding of the ecological (e.g. climatic conditions etc.) and biological characteristics of the project sites and their environs.

Other Issues

Additional emphasis was on the following key areas;

(i) Updating the environmental and social baseline conditions in and around Nakuru, Baringo, Uasin Gishu, Kakamega, Bungoma and Busia Counties,
(ii) Evaluating the land use patterns within the project areas and the larger Nakuru, Baringo, Uasin Gishu, Kakamega, Bungoma and Busia Counties in general with respect to influence from the railway line,
(iii) Reviewing the environmental impacts with particular focus on physical environment, social and economic issues as well as natural resources aspects within the project areas,

(iv) Reviewing the social implications of the project to be gathered through structured public participation and interviews of the public officials, community groups, farmers, land owners, public institutions, opinion leaders, etc.,

(v) Reviewing the mitigation measures and an environmental management plan outline,

This Environmental and Social Impact Study Report on the proposed project and associated accessories has been developed on the basis of available information and a report will be prepared for submission to the National Environmental Management Authority (NEMA) in accordance to the legislation. In addition to the physical environmental assessment, the communities (Farmers, business people, landowners, institutional heads, residents, etc.) within the project area will be involved through interviews and consultation forums to give their views and opinions as beneficiaries. Liaison with the local leadership and the administration is expected to facilitate this process while the presence of the Client's representative at this stage would be necessary in order to clarify certain policy issues that may arise during the meetings.

The ultimate goal was to identify the anticipated impacts resulting from the proposed project that is determined on the basis of the baseline conditions established during the field work and information obtained from the documents reviewed.

1.5.2. Documentary/ Literature Review

Various relevant documents were reviewed for a clear understanding of the terms of reference, environmental status of the project route areas, data on demographic trends (for the project route area, the beneficiary areas and the adjoining districts), land use practices in the affected areas (either as catchments, railway line corridor or the beneficiary areas), development strategies and plans (local and national) as well as the policy, legal and institutional documents.

1.5.3. Field Assessment

Field assessment was designed to address the physical, social, economic and biological environment. The field work session was, therefore, focused on establishing the anticipated positive and negative impacts in terms of physical and biological environment i.e. (hydrology, climatic patterns and water resources related aspects), social and economic trends, (population trends, settlement trends, economic patterns, cultural setting and linkages, land ownership issues, etc). Other specific objectives of the field study included;

(i) Evaluate the environmental setting along the railway line. General observations were focused on the topography, land use trends, ground and surface water sources, public amenities, wetlands, settlements, forests, soils, etc. Also to identify climatic and land cover variations along the affected areas,

(ii) Obtain any available information and data from the local public offices including environment, water, lands, education, health and agriculture. Public consultations were also conducted with the stakeholders.

(iii) Evaluate social, economic and cultural settings in the entire railway line corridor

(iv) Undertake comprehensive consultative public participation exercise such as to reach a large section of the project affected persons as well as other stakeholders.

1.5.4. Detailed ESIA Study Activities

This assignment involved a series of activities carried out in liaison with the relevant government departments, local authorities, community groups and other organizations in the area with a view to sharing their experiences and information with respect to environmental resources and social aspects. Effective evaluation of the social baseline status achieved through interviews (consultative meetings and discussions) and physical inspection of the entire project area. The baseline conditions provided the starting. point for the impacts predictions and benchmark for the mitigation measures. Details of the activities have been listed under the terms of reference, but the expected outputs for each activity are outlined in the sub-sections below;

(i) Review of the proposed railway line rehabilitation project details to understand project magnitude and the overall implementation plan.

(ii) Establishment of the current baseline conditions to provide a documented foundation for the impact predictions and a benchmark for the development of mitigation measures

(iii) Update of the legislative and regulatory requirements as a basis for drawing a compliance monitoring protocol for the construction and commissioning phases.

(iv) Environmental and social impacts assessments significant impacts to the environment and the nearby communities. Types and levels of impacts as well as criteria for developing suitable mitigation measures and an environmental management plan.

(v) Environmental management plan on mitigation measures, responsibilities, timeframes, environmental costs and an environmental management plan.

1.6. Stakeholders and Public Consultations

Field visits to also involve interviews of selected persons, groups of persons or institutional officials in collaboration with the County's Commissioner's Office. A questionnaire and other information collection tools have been prepared for application on stakeholders during the meetings. The consultations are meant to obtain available information and data.

1.7. Reporting

The ESIA Study Report has been done such as to cover the requirements of the National Environmental Management Authority (NEMA) EIA guidelines.

The structure of this ESIA Report is as follows:

- Executive Summary
- Introduction (Chapter 1)
- Project Description (Chapter 2)
- Policy, Institutional and Legal Framework (Chapter 3)
- Environmental and Socio-economic Baseline (Chapter 4)
- Analysis of Alternatives (Chapter 5)
- Project Activities (Chapter 6)
- Materials to be used (Chapter 7)

- Product and by products (Chapter 8)
- Public and Stakeholder Consultation (Chapter 9)
- Impact Identification and Mitigation Measures (Chapter 10)
- Environmental and Social Management and Monitoring Plan (Chapter 11)
- Conclusion and Recommendations (Chapter 12)
- Reference
- Appendices
  - ✓ Site Pictures
  - ✓ Experts' licenses
  - ✓ Questionnaires
  - ✓ Stakeholders Engagement minutes
  - ✓ Other relevant documents

1.8. ESIA Study Experts

This ESIA study was carried out by the following experts;

(i) Lead EIA Expert and Team Leader
(ii) Associate Expert
(iii) Sociologist
(iv) Railway Engineer
(v) Surveyor
(vi) Architect
(vii) Field Data Collection, Enumeration and Analysis

2. PROJECT DESCRIPTION

2.1. Project Location

The Longonot –Malaba MGR section railway line rehabilitation is located at the Rift Valley and western Kenya traversing various Counties including Nakuru, Baringo, Uasin Gishu, Kakamega, Bungoma and Busia County.

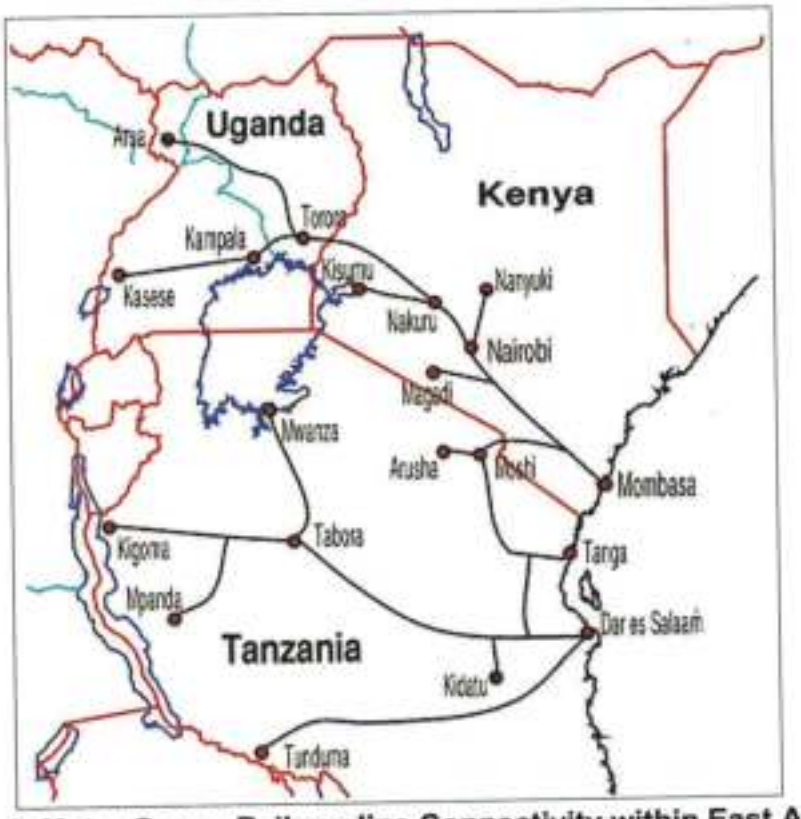

Figure 1: Meter Gauge Railway line Connectivity within East Africa

Figure 2: Longonot- Malaba MGR Route Map (*Courtesy of Google Maps*)

2.2. Scope of Work to be undertaken by Kenya Railways

2.2.1. Rehabilitation of Longonot- Malaba Railway Line

Currently, the Longonot- Malaba MGR line is operational for freight services only and most of the sections are in a dilapidated state or overgrown with vegetation. The dilapidated condition of the track is characterized by: ballast deficiency, silted side drains, overgrown bushes, buried tracks, encroachments of railway reserve; vandalized track elements; dilapidated station buildings and vandalized signaling and communication equipment. The poor condition of the line is due to deferred maintenance over a long time resulting in encroachment. Due to the deteriorated condition of the MGR railway line, KRs operations have been experiencing various derailments and capsizements while transporting transit cargo.

Rehabilitation of Longonot- Malaba MGR Section scope of work include;-

a. **Unclogging/ clearing existing storm water drainage systems**
   All blocked drainage systems and channels shall be unclogged to avoid wash away incidents during the rainy seasons and for railway line stability.
b. **Renovation of 465.1Km of track bed**

The railway track is composed of rails, sleepers, fastenings clips, ballast, roadbed, etc. The criteria for the track should be defined according to the annual passing tonnage and maximum operating speed of the line. Some of the activities to be done here are;-

- Desilting Ballast and pre screening
- Ballast Screening

c. **Adjustment of 258Km track curves;**

Track geometry is three-dimensional geometry of track layouts and associated measurements used in design, construction and maintenance of railroad tracks. The subject is used in the context of standards, speed limits and other regulations in the areas of track gauge, alignment, elevation, curvature and track surface.

- Re-railing
- Geometry Correction

d. **Repair 18million kg rail**
e. **Installation of 8,500no. new steel sleepers**
f. **Repair of 25,800no. existing steel sleepers**

By re-sleepering- replacing damaged / missing sleepers, replacing all rotten wooden sleepers at all turnout points.

Rail sleepers are an important part of railway components. In general, they are also called railroad ties, railway ties or crossties. In order to keep the correct distance of gauge, the rail sleeper usually lays between the two rail tracks.

g. **Fitting of 416,000 sets of new fasteners**
h. **Laying of 139,000m3 ballast**
i. **Laying of 278,000kg of new rails within the stations**
j. **Laying 50 sets of new turnouts within the stations**

Turnout is a combination of a set of points, V crossing and guard rails which permits traffic to turnout from one track to another.

k. **Renovation of 72 sets of existing turnouts within the stations**
l. **Laying of 29,000m3 of ballast within the stations**

Ballast is provided to give support, load transfer and drainage to the track and thereby keep water away from the rails and sleepers. Ballast must support the weight of the track and the considerable cyclic loading of passing trains. Ballast is made up of stones of granite or a similar material and should be rough in shape to improve the locking of stones. In this way they will better resist movement. Ballast stones with smooth edges do not work so well.

- Cess building
- Installation of missing track fittings i.e. fishplates, clips, fish bolts
- Overhaul of Turnouts (timber, self normalizing points to be fixed). Turnout is a combination of a set of points, V crossing and guard rails which permits traffic to turnout from one track to another.

m. **Level crossing overhauls & other minor repairs**

The frequency of train operation will become high after rehabilitation of the railway. Therefore, level crossings also need rehabilitation. The rehabilitation shall consist of installing the recommended check rails at the level crossings, whistle boards for approaching trains and St. Andrews warning signs for approaching vehicles

n. **Viaduct Repairs & Maintenance**

Substructure Strengthening Works, Strengthening of joists & U-channel bearers, Repainting & Bituminizing, Replacement of vandalized Tie Rods, RCC Deck Bridge/Culverts

Figure 3: A section of the existing MGR line covered with soil at Bungoma- Malaba Section

2.2.2. Fencing of Railway Stations

All existing Railway stations shall be fenced off using chain link and concrete posts to keep off trespassers from accessing the railway stations.

2.2.3. Removal of asbestos roofing sheets from the station buildings

Asbestos roofing sheets on all identified buildings shall be removed and replaced with corrugated iron sheets in accordance with the NEMA National Guidelines on Safe Management and Disposal of Asbestos. The stations identified with asbestos roofing include the following;

- Nakuru Railway Station
- Nakuru Locoshed
- Eldoret Railway Station
- Eldoret Locoshed
- Eldoret CXR

a) Risk Assessment for Asbestos removal

This means examining the potential risks posed by the Asbestos Containing Materials (ACMs) to health and identifying which precautions are needed to make the work safe.

All risk assessments are based on five key steps:

1. Identify the risks to health.
2. Identify who may be harmed by the risks.
3. Identify the precautions needed to remove or reduce the risks.
4. Record the findings and precautions, and implement them.
5. Review and update the risk assessment when required.

b) Water Supply Connection

All the active railway stations will also be reconnected with water supply

2.3. Projects Construction activities and inputs

Construction activities relate to preparatory stages of the project,

2.3.1. Pre- construction stage

This involves:

- Design and drawing of architectural plans and designs including establishing coordinates, elevation systems, resurveys and correcting any discrepancies between site and design drawings, review opinions on designs etc. has been ongoing.
- Survey of the project area.
- Environmental and social impact assessment, public participation process and seeking approvals by NEMA.

2.3.2. Inputs

The project will basically handle input materials of various nature:

a. **Non-hazardous materials**: The store for non-hazardous materials will be accommodated within the site area. Materials to be stored shall include samples for review / testing by consultants and or inspectors.
b. **Hazardous materials:** Hazardous materials shall include paints, oil, grease, vehicle fuel, bitumen etc. The store to keep these materials shall have iron sheet walling and roof and a waterproof concrete floor to contain spills. Storage and handling of all hazardous chemicals shall be in accordance with manufacturer's instructions as outlined on the material safety data sheets.
c. **Bulk construction materials:** The bulk materials to be stored on site include: sand, ballast, stones, cement, quarry chips, steel, timber etc. It is recommended that the project proponent should plan for material to be delivered in manageable quantities in order to avoid any form of deposit, which will impede site activities, induce safety hazards and create a nuisance to the neighbourhood.

Other inputs include:

- **Water**: The project will require significant volumes of water for various activities including spraying dusty sections, concrete-making, optimum compacting of different layers of materials constituting the roadway, cleaning operations in worksite camps. The project has the option of digging boreholes to supplement water needs for both road construction and campsite
- **Labour**: The contractor will hire skilled, semi-skilled and unskilled workers. In terms of numbers to be mobilized, this has not yet been estimated.

2.3.3. Site office

The proponent/contractor shall construct temporary site offices/sites especially for the teams along the corridor to run and manage all activities at different phases. This will also include securing of the utility services such as water, electricity which will be crucial for the construction activities.

2.3.4. Site Management

Clearly visible signage on roads and buildings under construction will be set up. Sufficient and quality diversions will be created as well as protected walkways for pedestrians maintained. Provision and maintenance of access to all properties and project neighbours' facilities will be mandatory.

2.3.5. Foreseen Works

- Site clearing of the entire corridor and removal of encroachment;
- Rehabilitation of the permanent way infrastructure (i.e. subgrade, drainage system, line geometry correction, replacement of rails, replacement of sleepers, fittings and fastenings, replacement of collapsed pipe culverts, strengthen of bridges and viaduct, reinstatement of signaling, communication and control systems, repair of station building structures, construction of new stations, fencing of station areas etc
- Refurbishment of available locomotives
- Refurbishment of rolling stock
- Landscaping

2.4. Project cost

The cost of the rehabilitation of Longonot – Malaba MGR line is approximately 2.5 Billion Kenya Shillings.

3. POLICY, LEGAL, REGULATORY AND ADMINSTRATIVE FRAMEWORK

3.1 Introduction

The Third Schedule of EIA/EA Regulations requires that environmental guidelines and standards which include Kenya government policies and strategies, national legislation, multi-lateral environmental agreements and the institutional arrangements to render them should be incorporated in an ESIA report. The legal and institutional frameworks provide important safeguards for protection and conservation of vulnerable and fragile environments and communities and support the implementation of the EMPs. Under this section, the ESIA will therefore review the applicable sets of laws, international agreements and institutions which environmental compliance requirements for the proposed rehabilitation of the Longonot –Malaba MGR Main line.

The Kenyan Government has put in place a wide range of policy, institutional and legislative arrangements to address the causes of environmental degradation in the country. Laws governing environmental protection and conservation in Kenya are derived from the constitutional statutes and the ratified international conventions. These laws regulate the establishment and operation of development projects and their associated activities, which may have negative impact on the environment, human health and socio-economic well-being of the people who interact with such projects.

Before the enactment of the Environmental Management and Coordination Act (EMCA) 1999, Kenya did not have a consolidated legislation for the protection and management of the environment. It had about 77 statutes that touched on various aspects of environmental management. Some of the legislative instruments have been in place for many years and are duplicated in other legislations. Environmental protection and sustainable use of natural resources have also been stated in all development plans since independence. The sessional papers and presidential directives have also emphasized the need to conserve the environment and manage the natural resources sustainably. Lack of consolidated legislation offered inadequate protection for the environment due to the absence of legal and institutional framework.

3.1.1 The Constitution of Kenya

The Constitution of Kenya 2010 is the supreme law of the land. Under Chapter IV, Article 42 provides for the right to a clean and healthy environment for all. Further, Article 43 states the supporting of public involvement in ensuring the need for every person to have access to clean and safe water in adequate quantities; Article 69 - Environment and natural resources (1) (d) encourages public participation in the management, protection and conservation of the environment (f) Supports environmental impact assessment, environmental audit and monitoring of the environment (g) Eliminates processes and activities that are likely to endanger the environment; and Article 66 – Regulates use of any land or any interest or right over any land, in the interest of public health or public planning; Article 185: 22 - Protects the environment and natural resources with a view to establishing a durable and sustainable system of development.

Relevance to the proposed project

The proponent should ensure that railway operations do not infringe on the right to a clean and healthy environment for all. Additionally, the proponent must ensure that the operations are carried out in an ecologically, economically and socially sustainable manner, the project will contribute to social and economic development at national level and also in the around Nakuru, Baringo, Uasin Gishu, Kakamega, Bungoma and Busia Counties.

3.1.2. Kenya Vision 2030

Article 42 of the Bill of Rights of the Kenyan Constitution provides that 'every Kenyan has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures'. Under Chapter 5 (Land and Environment), Part 1 is devoted to land. It requires that land be used and managed in 'a manner that is equitable, efficient, productive and sustainable, and in accordance with the following principles:

Equitable access to land;

(i) Security of land rights;
(ii) Sustainable and productive management of land resources;
(iii) Transparent and cost effective administration of land; and
(iv) Sound conservation and protection of ecologically sensitive areas.

Part 2 of Chapter 5 of the Constitution is dedicated to Environment and Natural Resources. Article 69 in Part 2 provides that the state shall;

(i) Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
(ii) Work to achieve and maintain tree cover of at least ten per cent of the land area of Kenya;
(iii) Encourage public participation in the management of, protection and conservation of the environment;
(iv) Protect genetic resources and biological diversity;
(v) Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
(vi) Eliminate processes and activities that are likely to endanger the environment; and
(vii) Utilize the environment and natural resources for the benefit of the people of Kenya.

3.1.3 National Environment Action Plan

According to the Kenya National Environment Action Plan (NEAP), 1994 the Government recognized the negative impacts on ecosystems emanating from economic and social development programmes that disregarded environmental sustainability. In this regard, establishment of appropriate policies and legal guidelines, as well as harmonization of the existing ones, has been accomplished, while some others are in the process of development. Under the NEAP process Environmental Impact Assessment (EIA) was introduced and among the key participants identified were the institutions dealing with water resources management. Chapter 4 sub-section 4.1.3 the NEAP report recommends that EIA be made a pre-condition for approval of all projects as well as post investment impact assessment for all related operations.

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

Among the key objectives of the Sessional Paper No. 6 of 1999 on Environment and Sustainable Development (1993) include ensuring that development policies, programmes and projects take environmental considerations into account, ensuring that an independent environmental impact assessment (EIA) report is prepared for any development before implementation and to ensure that effluent treatment standards that conform to acceptable health standards. This paper provided the basis for the environmental Policy framework that is in the process of formulation. Under this paper, broad categories of development issues have been covered that require sustainable approach. These issues include the waste management and human settlement sectors. The paper recommends the need for enhanced re-use/recycling of residues including wastewater and increased public awareness raising and appreciation of clean environment as well as the participation of stakeholders in the

3.1.5 The National Poverty Eradication Plan (NPEP) and the Poverty Reduction Strategies Paper (PRSP)

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

3.2 Legal Framework

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

Part II of the Environment Management & Coordination Act, 1999 states that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. In order to partly ensure this is achieved, Part VI of the Act directs that any new programme, activity or operation should undergo environmental impact assessment and a report prepared for submission to the National Environmental Management Authority (NEMA), who in turn may issue a license as appropriate.

Section 87 sub-section 1 states that no person shall discharge or dispose of any wastes, whether generated within or outside Kenya, in such a manner as to cause pollution to the environment or ill health to any person, while section 88 provides for acquiring of a license for generation, transporting or operating waste disposal facility. According to section 89, any person who, at the commencement of this Act, owns or operates a waste disposal site or plant or generate hazardous waste, shall apply to the NEMA for a license. Sections 90 through 100 outline more regulations on management of hazardous and toxic substances including oils, chemicals and pesticides.

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

Compliance Aspects: This applies in all aspects of the intervention project including among others;

i. Social disruption control
ii. Waste management
iii. Effluent discharge practices
iv. Aerial emissions,
v. Excessive noise and vibrations
vi. Excavations and soil loss
vii. Adverse interference with natural resources including wetlands and water resources.
viii. The project cycle should ensure compliance with this statute all the time.

3.2.4 Environmental Management Regulations

Water Quality Regulations, 2006 (Legal Notice No. 120) These regulations were drawn under section 147 of the Environmental Management and Coordination Act 1999. In accordance with the regulations, every person shall refrain from acts that could directly or indirectly cause immediate or subsequent water pollution and no one should throw or cause to flow into water resources any materials such as to contaminate the water. The regulation also provides for protection of springs, streams and other water sources from pollution.

Compliance Aspect: This will apply anytime there is a discharge of effluent into the environment without meeting the established standards. This requires all time compliance through the project cycle.

Table 2: Recommended guidelines for waste water discharge.

Parameters	Units	Discharge into public sewer	Discharge into open water bodies
PH	-	6.0-9.0	6.0-9.0
BOD (5 days at 20°) not to exceed	Mg/l	500	20
COD not to exceed	Mg/l	1000	50
Total suspended solids not to exceed	Mg/l	500	30
Copper (Cu) not to exceed	Mg/l	1.0	0.05
Lead (Pb) not to exceed	Mg/l	1.0	0.1
Total Mercury (Hg) not to exceed	Mg/l	0.05	0.005
PCB not to exceed	Mg/l	Nil	0.003
Sulphates not to exceed	Mg/l	1,000	500
Dissolved Magnesium (mn)	Mg/l	-	1.0
Chlorine not to exceed	Mg/l	1000	1000
Fluoride not to exceed	Mg/l	-	2.0
Coli form bacteria	Mg/l	-	1,000/100ml
Total dissolved solids not to exceed	Mg/l	3,000	1,200
Temperature not to exceed	-	+/-2 of the ambient temperature	
Oil/ grease	Mg/l	No trace	Nil/No trace

Source: Department of water development.

Waste Management Regulations, 2006 (Legal Notice No. 121) The regulations are formed under sections 92 and 147 of the Environmental Management and Coordination Act, 1999. Under the regulations, a waste generator is defined as any person whose activities produces waste while waste management is the administration or operation used in handling, packaging, treatment, conditioning, storage and disposal of waste. The regulations requires a waste generator to collect, segregate and dispose each category of waste in such manners and facilities as provided by relevant authorities. Regarding transportation, licensed persons shall operate transportation vehicles approved by NEMA and will collect waste from designated areas and deliver to designated disposal sites.

Compliance Aspect: *This will apply on disposal of solid wastes in compliance with the established standards and procedures. This requires all time compliance.*

Noise and Excessive Vibration Pollution Control Regulations, 2009- 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 and section 3(2) states that in determining whether noise is loud, unreasonable, unnecessary or unusual. 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 30m from any moving source.

Compliance Aspect: *This will apply to effects of activities with noise and vibrations in excess of the established standards.*

Fossil Fuel Emission Control Regulations, 2006- This Regulation aims at eliminating or reducing emissions generated by internal combustion engines to acceptable standards. The regulation provides guidelines on use of clean fuels, use of catalysts and inspection procedures for engines and generators. This regulation is triggered as the proponent would use vehicles and equipments that depend on fossil fuel as their source of energy. It is recommended the requirements of the regulation be implemented in order to eliminate or reduce negative air quality impacts.

Compliance Aspect*: This would be relevant for construction equipment and vehicles and operations within the project road thereafter, and particularly with respect to utilization of the pavements*

Integrated Environmental (Impact Assessment and Audit) Regulations, 2003 (Revised 2018)

These regulations are made under section 147 of the EMCA, 1999 (Amended 2015), and contain rules relative to content and procedures of an EIA in the sense of section 58 of the Act. They also contain rules relative to environmental impact audit (EA) and monitoring and

strategic environmental assessment (SEA) and regulate some other matters such as appeal and registration of information regarding environmental impact assessment.

Regulation 3 states that:

"These Regulations shall apply to all policies, plans, programmes, projects and activities specified in Part IV, Part V and the Second Schedule of the Act."

Compliance Aspect: *This study was done to comply with this regulation under Second Schedule of the EMCA, 1999, Amendment 2015.*

3.2.3 The Water Act 2002

Part II section 18 provides for national monitoring and information systems on water resources. Following on this, sub-section 3 allows the Water Resources Management Authority to demand from any person, specified information, documents, samples or materials on water resources. Under these rules, specific records may be required to be kept and the information thereof furnished to the authority on demand.

Section 25 of the Act requires a permit to be obtained for among others any use of water from a water resources, discharge of a pollutant into any water resource. According to section 29 of the same Act, application for such a permit shall be subject to public consultation as well as an environmental impact assessment as per the Environmental Management and Coordination Act, 1999. The conditions of the permit may also be varied if the authority feels that the water so used is causing deterioration of water quality or causing shortage of water for other purposes that the authority may consider has priority. This is provided for under section 35 of the Act.

Compliance Aspect: *The statute established to coordinate sustainable utilization of water resources including protection of the same from pollution and degradation (abstraction, use and disposal of wastewater thereof). Related water rules should be applied at all times. Water related initiatives should undergo ESIA process.*

3.2.4 Public Health Act (Cap 242)

Part IX section 115 states that no person shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires Local Authorities to take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable for injurious or dangerous to human health.

Such nuisance or conditions are defined under section 118 as waste pipes, sewers, drains or refuse pits in such a state, situated or constructed as, in the opinion of the medical officer of health, to be offensive or injurious to health. Any noxious matter or waste water flowing or discharged from any premises into Public Street or into the gutter or side channel or watercourse, irrigation channel or bed not approved for discharge is also deemed as a nuisance. Other nuisances are accumulation of materials or refuse which in the opinion of

the medical officer of health is likely to harbour rats or other vermin.

On the responsibility of local authorities, Part XI section 129 of the Act states in part "It shall be the duty of every local authority to take all lawful, necessary and reasonably practicable measures for preventing any pollution dangerous to health of any supply of water which the public within its district has a right to use and does use for drinking or domestic purposes, and purifying such supply so polluted". Section 130 provides for making and imposing on local authorities and others the duty of enforcing rules in respect of prohibiting use of water supply or erection of structures draining filth or noxious matter into water supply as mentioned in section 129.

Compliance Aspect: *All health and safety measures should be in place to ensure the workers and the neighboring communities are not exposed to risks*

Legal Notice No. 50 of 2020

Due to the COVID 19 Pandemic The Cabinet Secretary for health invoked the Public Health Act under section 36, to restrict Movement of Persons and Related Measures Rules, in view of the serious threat posed to the health and lives of Kenyans by the spread of the COVID-19 pandemic. Section 7 of the Legal Notice bans all public gatherings except funerals which are limited to fifteen people.

Compliance Aspect: *All public meetings which were scheduled to be held were cancelled as a result of the Legal Notice.*

3.2.5 National Guidelines on Safe Management and Disposal of Asbestos, Revised 2013

The guidelines developed in 2012 and revised in 2013 require the proponent to:

- Take appropriate measures to prevent or control release of asbestos dust into the air.
- Ensure that exposure limits or other exposure criteria are complied with.
- Reduce exposure to asbestos dust to as low a level as is reasonably practical.
- Provide, maintain and replace as necessary, at no cost to the workers, adequate respiratory protective equipment in the event measures prescribed in (a) to (c) do not bring exposure to asbestos within exposure limits or do not comply with other exposure criteria.
- Establish and implement practical measures for prevention and control of exposure of workers to asbestos and for their protection to hazards due to asbestos.
- Engage contractors recognized by NEMA as qualified in removal of asbestos according to provision of the guidelines.
- Ensure that the contractor before starting demolition works (removal of asbestos) draws up a work plan (in consultation with workers or their

representatives) specifying the measures to be taken including:

- Provide appropriate personal protective equipment like respirators, overalls, Rubber boots, gloves and eye protection to the workers coming into contact with asbestos.
- Limit the release of asbestos dust into the air and
- Provide for disposal of asbestos according to Article 19 of the Asbestos Convention of 1986.
- Provide appropriate working clothes (PPEs) which shall not be worn outside the workplace in situations where the workers' personal clothing may be contaminated with asbestos dust.
- Ensure handling and cleaning of used work clothing and special protective clothing is carried out under controlled conditions as required by NEMA to prevent release of asbestos dust.
- Clean, maintain and store work clothing, special protective clothing and PPEs.
- Provide facilities for workers exposed to asbestos to wash, take a bath or shower at workplace as appropriate.
- Dispose waste containing asbestos in a manner that does not pose health risks to workers concerned including those handling asbestos waste or population in the vicinity of the railway stations.
- Take appropriate measures to prevent pollution of the general environment by asbestos dust released from the workplace.

Compliance Aspect: *The KR shall be required to follow these guidelines when handling, transporting and disposing the asbestos from the roofs of the various old structures at the stations.*

3.2.8 The Lands Act, No. 6 of 2012

Part II Section 8 provides guidelines on management of public land by National Land Commission on Behalf of both National and County Governments. This law in Section 8(b) stipulates that the Commission shall evaluate all parcels of public land based on land capability classification, land resources mapping consideration, overall potential for use, and resource evaluation data for land use planning. Section 8(d) stipulates that The Commission may require the land to be used for specified purposes subject to such conditions, covenants, encumbrances or reservations as are specified in the relevant order or other instrument.

In managing public land the Commission is further required in Section 10(1) to prescribe guidelines for the management of public land by all public agencies, statutory bodies and state corporations in actual occupation or use. In these guidelines management priorities and operational principles for the management of public land resources for identified uses shall be stated. This in essence means that the Commission shall take appropriate action to maintain public land that has endangered or endemic species of flora and fauna, critical habitats or protected areas. As well the Commission shall identify ecologically sensitive

areas that are within public lands and demarcate or take any other justified action on those areas and act to prevent environmental degradation and climate change.

Compliance Aspect: *This part of the law seeks to preserve and direct management of fragile public land held by the various public bodies for sustainable development.*

3.2.9 Physical Planning Act (Cap 286)

Section 24 of the Physical Planning Act gives provision for the development of local physical development plan for guiding and coordinating development of infrastructure facilities and services within the area of authority of County, municipal and town council and for specific control of the use and development of land. The plan shows the manner in which the land in the area may be used. Section 29 of the Physical Planning Act gives the county councils power to prohibit and control the use of land, building, and subdivision of land, in the interest of proper and orderly development of its area. The same section also allows them to approve all development applications and grant development permissions as well as to ensure the proper execution and implications of approved physical development plans. On zoning, the act empowers them to formulate by-laws in respect of use and density of development.

Section 30 states that any person who carries out development within an area of a local authority without development permission shall be guilty of an offence and the development shall be invalid. The act also gives the local authority power to compel the developer to restore the land on which such development has taken place to its original conditions within a period of ninety days. If no action is taken, then the council will restore the land and recover the cost incurred thereto from the developer. In addition, the same section also states that no person shall carry out development within the area of a local authority without development permission granted by the local authority. At the same time, subsection 5, re-enforce it further that, no licensing authority shall grant under any written law, a license for commercial use for which no development permission had been granted by the respective local authority.

Section 36 states that if in connection with development application a local authority is of the opinion that, the proposed activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an Environmental Impact Assessment report. The environmental impact assessment report must be approved by the National Environmental Management Authority (NEMA) and followed by annual environmental audits as spelled out by EMCA 1999. Section 38 states that if the local authority finds out that the development activity is not complying to all laid down regulations, the local authority may serve an enforcement notice specifying the conditions of the development permissions alleged to have been contravened and compel the developer to restore the land to its original conditions.

3.2.10 HIV/AIDS Prevention and Control Act (Act No.14 of 2006).

Part 11, Section 7 requires HIV and AIDs education in the work place. The government is expected to ensure provision of basic information and instruction on HIV and AIDs prevention and control to; Employees of all Government ministries, Departments, authorities, and other agencies; and, Employees of private and informal sectors. The information on

HIV/AIDs is expected to be treated with confidentiality at the work place and positive attitudes shown towards infected employees and workers.

***Compliance Aspect** : During the rail rehabilitation, the contractor is expected to create awareness to the employees and the local communities on the issues related to HIV/AIDs.*

3.2.11 Traffic Act (Cap. 403)

The highway authority is expected to erect and maintain traffic signs as prescribed so as plainly to indicate to drivers entering or leaving such roads or areas where the fifty kilometer per hour speed limit restriction begins and ends. Section 47 of the act states that any person who drives a motor vehicle on a road recklessly, or at a speed or in a manner which is dangerous to the public, shall be guilty of an offence and liable to a fine . Part VIII of cancelling any driving license or provisional driving license held by the offender and declaring the offender disqualified for holding or obtaining a driving license for such period as it thinks fit.

Section 52 Part 1, The driver of the vehicles are expected at all times to obey directions given by the police officer whether verbally or in signal, conform to the indications given by any traffic sign, and when any person in charge of any cattle raises his hand or in any manner signalling to stop, and keep it stationary for as long as it is reasonably necessary.

Section 52 A forbids any person who, being the driver of a vehicle from leaving the vehicle for a period in excess of the time, failing to comply with any traffic sign or leaving the vehicle in contravention of any traffic sign in any parking bay or parking area. Section 71, gives permission to the authority or the authority representative to close the roads for purpose of preventing damage caused to any road, carry out any works considered necessary in connection with maintenance/improvement of road or close whole or part of road to vehicles of particular type at any time for any period.

Under the Traffic sign rules part 13, temporary traffic sign signal unit may be used for purposes of controlling the movement of vehicles on the road where the road works are in progress or where the width of the carriageway is temporary restricted.

3.2.13 Urban Areas and Cities Act, 2011

Section 5 states that a municipality is eligible for a city status if it has infrastructural facilities including but not limited to roads, street lights, market and fire station and an adequate capacity for disaster management. Has infrastructure that provides national and regional connectivity.

Under section 26 (b) gives power to the council of the city or large municipality to formulate and implement a master plan for urban and physical planning and infrastructural development and provision of essential services including; provision of water, sanitation, health care, education, housing, transport, disaster management systems and facilities for safe environment.

According to section 26 (c) the council is expected to exercise control over land use, land sub-division, land development and zoning by public and private sectors for any purpose including; agriculture, industry, commerce, markets, employment centers, residential, recreational parks, entertainment, passenger transport freight and the transit stations within framework of spatial and master plans for the city and municipality. Section 44 provides for the council to form partnership on provision of social infrastructural services with companies within and outside the country. This includes; construction of roads, environment conservation and preservation, construction of health centers and promotion of tourism and cultural events.

3.2.14 Occupation Safety and Health Act, 2007

Section 13 part 1(a) the employee is expected to ensure his own safety and health and of the other person who may be affected by his acts or omissions at work place, (c)requires the employee at all times to use protective equipment or clothing provided by the employer for purpose of preventing risks to his safety and health, (f) report to the supervisor any accidents or injury that arise in connection with his work Part 2 states that any employee who fails to follow this section commits an offence and shall on conviction be liable to a fine or imprisonment.

Section 21 provides that the employer or self employed person to notify the occupational health and Safety Officer of any accidents, dangerous occurrence, or occupational poisoning which has occurred at the work place. Section 32 gives power to the occupational safety and Health officer to enter inspects examine by day or night, a work place which he has reasonable cause to believe to be a work place and any part of any building of which forms a work place. Section 55 requires all plant, machinery and equipment whether fixed or mobile for use at work place to be used for designed work and operated by a competent person. Section 97 prohibits employers to employ persons below the age of 18 years at the work place or perform work by which its nature its likely to harm the persons safety or health.

3.2.15 Work Injury Benefits Act, 2007

This Act provides for compensation to employees for work related injuries and disease contracted in the course of their employment and for connected purposes. Key sections of the Act include the obligations of employers; right to compensation; reporting of accidents; compensation; occupational diseases; medical aid etc. In case of any accidents or incidents during the project cycle, this Act will guide the course of action to be taken.

3.3 The World Bank Safeguards

3.3.1 OP/BP 4.01 (Environmental Assessment)

The World Bank has well-established environmental assessment procedures, which apply to its lending activities and to the projects undertaken by borrowing countries, in order to ensure that development projects are sustainable and environmentally sound. Although its operational policies and requirements vary in certain respects, the World Bank follows a relatively standard procedure for the preparation and approval of an environmental assessment study, which:

(i) Identifies and assesses potential risks and benefits based on proposed activities, relevant

site features, consideration of natural/human environment, social and trans-boundary issues, (ii) Compares environmental pros and cons of feasible alternatives, (iii) Recommends measures to eliminate, offset, or reduce adverse environmental impacts to acceptable levels (sitting, design, technology offsets), (iv) Proposes monitoring indicators to implement mitigation measures, (v) Describes institutional framework for environmental management and proposes relevant capacity building needs.

The environmental assessment evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The assessment takes into account: the natural environment (air, water, and land); human health and safety) social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and transboundary and global environmental aspects. Preventive measures are favoured over mitigation or compensatory measures, whenever feasible. This approach is universally applied in many institutional projects.

The World Bank considers environmental impact assessment (EIA) as one among a range of instruments for environmental assessment. Other instruments used by the World Bank include regional or sectoral environmental assessment, strategic environmental and social assessment (SESA), environmental audit, hazard or risk assessment, environmental management plan (EMP) and environmental and social management framework (ESMF). The Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of environmental assessment.

3.3.2 OP/BP 4.04 (Natural Habitats)

The policy is designed to promote environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The policy seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water area where most of the native plant and animal species are still present).

3.3.3 OP/BP 4.11 (Physical Cultural Resources)

This policy is meant to assist in preserving physical cultural resources including the movable or immovable (above or below ground, or under water) objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance including sites and unique natural values. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The objective of this policy is to avoid or mitigate adverse impacts on physical cultural resources from development projects. There are no significant conflicts in this regard.

3.3.4 OP/BP 4.12 (Involuntary Resettlement)

The policy states that "Where large-scale of population displacement is unavoidable, a detailed resettlement plan, timetable, and budget are required. Resettlement plans should be built around a development strategy and package aimed at improving or at least restoring the economic base for those relocated. Experience indicates that cash compensation alone is normally inadequate. Voluntary settlement may form part of a resettlement plan, provided measures to address the special circumstances of involuntary re-settlers are included. Preference should be given to land-based resettlement strategies for people dislocated from agricultural settings. If suitable land is unavailable, non land-based strategies built around opportunities for employment or self-employment may be used".

Involuntary resettlement is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The objective of this policy is to avoid or minimize involuntary resettlement, though participation in resettlement planning and implementation and, where this is not feasible, to assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects. There are notable resettlement issues along the corridor triggering this aspect. The RAP study was being reviewed alongside this ESIA Review.

3.4 Institutional Responsibility

Kenya Railways Corporation Cap 397, Revised Edition, 2012

It is Act of Parliament to provide for the establishment of a Corporation to be known as Kenya Railways, for the transfer to the Corporation of the undertakings of the East African Railways Corporation within Kenya, for the functions of the Corporation and for purposes connected there with. The general obligation of KR is to provide a synchronized and incorporated system within KR being the proponent for the proposed access road will ensure that the project meets all legal Kenya for rail transport services.

4. BASELINE ENVIRONMENTAL AND SOCIO-ECONOMIC INFORMATION

4.1. Kenya National Socio-Economic Profile

4.1.1. Environment

The environment in Kenya consists of a wide range of natural ecosystems including arid and semi-arid areas, savannah and forests within its total area of 581,700 km2. The Great Rift Valley is a mega geomorphic landscape which cuts across the country from North to south with a total length of over 800km in Kenya, a width of 50-100km, and a depth of 450-1000 m, The rift valley is characterized by geological instability due to on-going tectonic motion and is therefore a major challenge in engineering operations. The country, like the rest of the world, has a rapidly expanding built environment in the urban areas. The water or aquatic environment is composed of marine and coastal ecosystems, inland freshwater and saline lakes and a network of periodic and permanent rivers. The aquatic environment includes 14,300 km^2 and 143,100 km^2 of territorial waters and Exclusive Economic Zone (EEZ) respectively in the Indian Ocean. The country has over 35 000 known species of flora and fauna for which remarkable conservation efforts have been made with about 53 national and international protected areas including 5 Biosphere Reserves, 4 Ramsar Sites and 3 World Heritage Sites .

4.1.2. Administration and Size

Kenya is divided into 47 counties and each county is further divided into sub-counties and wards, which are now the focal points of service delivery. The total land area covered by Kenya is approximately 583,000km^2, which consists of land area of 569,300 km^2, water area of 13,400 km^2 and other area of 536 km^2.

4.1.3. Population

Currently, the national total population had reached 47,564,296, with an annual population growth rate of 1.57%. 27% of the total population is in urban areas. Although the level of urbanization is still low in Kenya, the rate of urbanization is high. The rate of urbanization is 4.23 percent for the period of 2015-2020. Forty-five (45) percent of the urban population is located in Nairobi out of the 194 urban centers in Kenya. The rise of squatter settlements and slums in urban centers is a major obstacle in the establishment of social infrastructure such as roads and railways. The country has a total of 42 tribes and economic development is expected to penetrate into all ethnic groups.

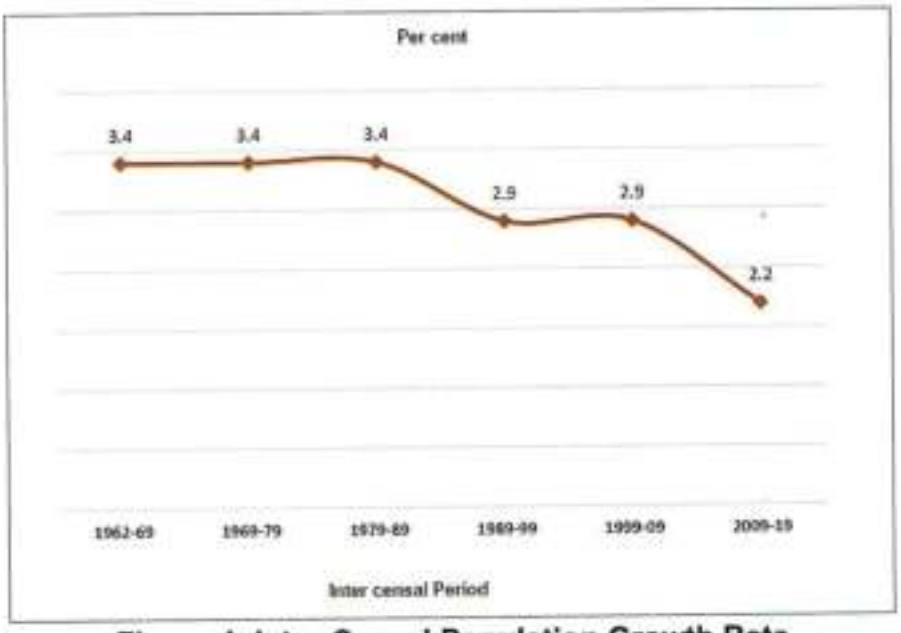

Figure 4: Inter-Censal Population Growth Rate

4.1.4. Agriculture

Growth in Agriculture Value Added at constant prices increased to 6.6 per cent in 2018 from 1.8 per cent recorded in 2017. The improved performance during the year under review was due to favourable weather conditions for both crops and livestock production, occasioned by the long rains in 2018. Maize production increased by 26.0 per cent from 35.4 million bags in 2017 to 44.6 million bags in 2018. Production of tea and coffee recorded growths of 12.1 and 7.0 per cent, respectively, during the review period. The volume of fresh horticultural exports increased by 6.1 per cent to 322.6 thousand tonnes in 2018. The value of marketed livestock and livestock products increased by 8.3 per cent to KSh 146.8 billion during the year under review.

During the review period, the prices of tea and coffee declined by 15.5 per cent and 15.3 percent to Kshs. 25,896.47 and Kshs. 40,286.41, respectively, per 100 kilogram. The price paid for wheat increased by 11.2 per cent from Kshs. 3,197.99 per 100 kilogram in 2017 to Kshs. 3,555.50 per 100 kilogram in 2018. The total domestic sugar production increased by 30.6 per cent from 376.1 thousand tonnes in 2017 to 491.1 thousand tonnes in 2018. Overall, marketed production increased by 11.4 per cent from Kshs. 446.9 billion in 2017 to Kshs. 497.9 billion in 2018.

4.1.5. Transport and Storage

The value of output from transport and storage expanded by 14.6 per cent from Kshs. 1,092.1 billion in 2017 to Kshs. 1,252.0 billion in 2018. Cargo throughput handled at the Port of Mombasa rose from 30.3 million tonnes in 2017 to 30.9 million tonnes in 2018. Commercial passenger traffic handled at the airports increased by 16.8 per cent to 11.8 million in 2018. Domestic and international passengers handled increased by 22.5 per cent and 13.1 per cent to 4.9 million and 6.9 million, respectively, during the review period.

Rail freight traffic more than tripled from 1,147 thousand tonnes in 2017 to 3,544 thousand tonnes in 2018, mainly due to introduction of freight transportation services on the Standard Gauge Railway (SGR). Revenue from railway freight increased from Kshs. 3.0 billion in 2017 to Kshs. 9.8 billion in 2018. Similarly, earnings from passenger traffic stream more than doubled to Kshs. 1.7 billion in 2018.

The total length of Kenya railway network is 2,210 km. The network runs from Mombasa through Nairobi, Nakuru, to the Uganda border at Malaba, a distance of some 1,083 km. A branch line of 217km is going from Nakuru to Kisumu, where it links with a ferry service on Lake Victoria. There is a set of additional branch lines, 618km long in total, to Magadi, Taveta (Tanzania border), Nanyuki, Kitale, Butere, Nyahururu and Solai. The existing railway line links Mombasa Port to Nairobi and then Nairobi to Nakuru, Kisumu and Malaba) and facilitates import and export trade in the country and also to the neighboring countries. Figure 4-5 shows the current distribution of railway network in East Africa. The railway network distribution in Kenya is shown in the next **Figure.**

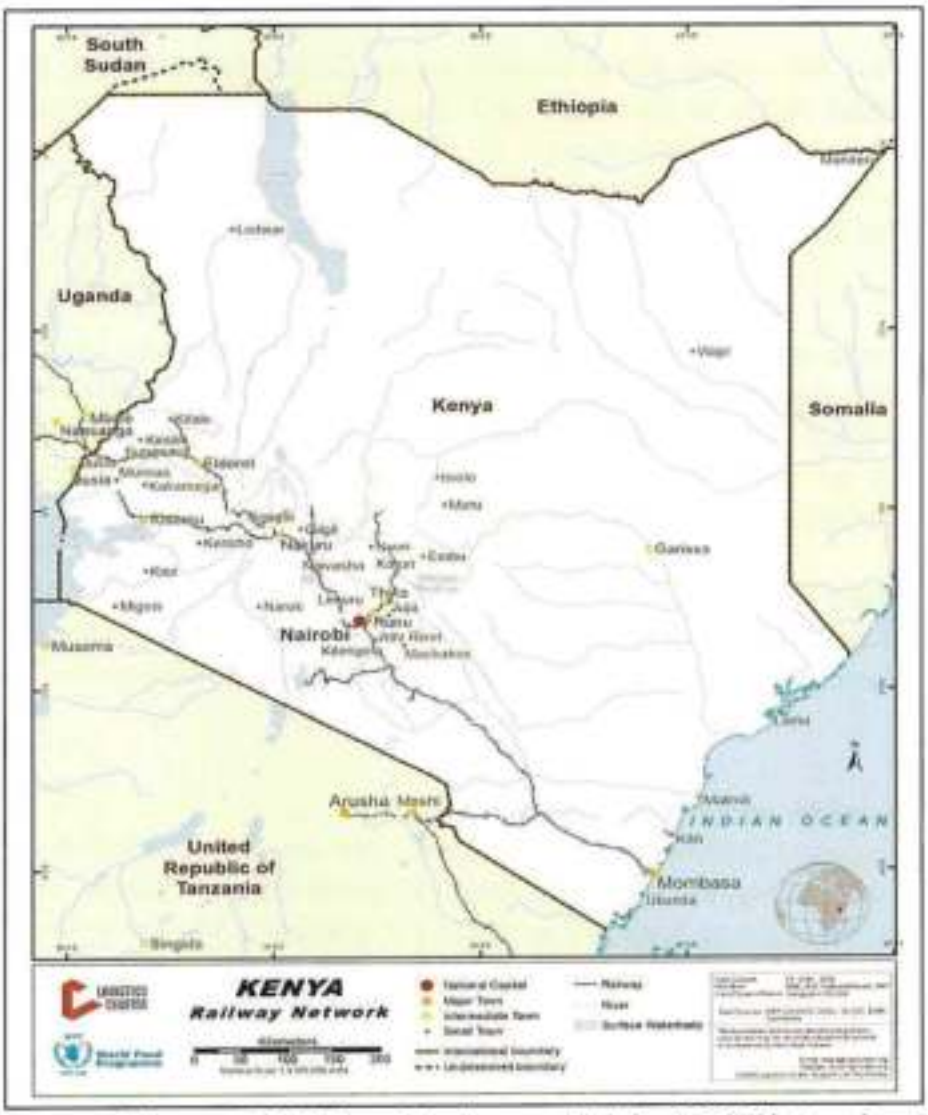

Figure 5: Existing Mombasa - Malaba MGR Network

4.2. Nakuru County

4.2.1. Location and Size

Nakuru County is one of the 47 Counties of the Republic of Kenya established in the Constitution of Kenya 2010 which covers 7498.8Km^2. The name Nakuru means 'a dusty place' in the Maasai language-in reference to frequent whirlwinds that engulf the area with clouds of dust. The County is among the most cosmopolitan in the country. The dominant communities include; Kikuyu and Kalenjin. Other communities present in the County include; Luo, Luhya, Maasai, Kamba, Meru among others. The County is among the 14 Counties within the Rift Valley region. The County covers an area of approximately 7,498.8 Km² and is located between Longitudes 35.41 ° East or 35 ° 24' 36" East and 36.6 °East or 36 °36' 0" East and Latitude 0.23 ° North or 0 ° 13' 48" North and 1.16 ° South or 1° 9'36" South. The County headquarters is Nakuru Town. The County's two major towns are; Nakuru Town which is the County's headquarters and Naivasha town which is popular for both local and international tourism because of its proximity Nairobi the capital city of Kenya. Nakuru and Naivasha towns are complemented by other urban centres spread across the County that include; Molo, Njoro, Gilgil, Mai Mahiu, Subukia, Salgaa and Rongai.

It is located in the Rift Valley and it borders seven Counties; Laikipia to the north-east, Kericho to the West, Narok to the south-west, Kajiado to the South, Baringo to the North, Nyandarua to the East and Bomet to the West. The County has 11 sub-counties/constituencies namely; Naivasha, Nakuru Town West, Nakuru Town East, Kuresoi South, Kuresoi North, Molo, Rongai, Subukia, Njoro, Gilgil and Bahati. There are 55 wards in the County.

The major economic activities include; agriculture, tourism and financial services. Nakuru is an agricultural rich County whose background was shaped by the early white settlement schemes. The County human settlement has been shaped by major transport infrastructure i.e. early colonial rail network and road A104. The poverty level for the County is at 29.1 percent below the National target which is at 36.1 percent.

4.2.2. Population

The county's population was reported to be 2,162,202 in accordance with the 2019, Kenya Population and Housing Census with 1,077,272 males, 1,084,835 females and 95 being intersex.

4.2.3. Physiography and Natural Conditions

The main topographical features in Nakuru County are the Mau Escarpment covering the Western part of the County, the Rift Valley floor, Ol-Doinyo Eburru Volcano, Akira Plains and Menengai Crater. The County boasts of an elaborate drainage and relief system with various inland lakes on the floor of the Rift Valley where nearly all the permanent rivers and streams in the County drain into. These rivers include river Njoro and Makalia which drain into Lake Nakuru, Malewa which drains into Lake Naivasha and Molo River which drains into Lake Baringo among others. The topographical features provide an interesting niche for research as well great tourist attraction sites. One of the predominant features is the Hells Gate gorges in Naivasha which is part of the important tourist sites. The topography in Naivasha

and Gilgil Sub-Counties is characterized by mountain ranges and savannah vegetation that supports various species of wildlife. The County's soil pattern presents a complex distribution of three main classifications that have been influenced by climatic conditions, volcanic activities and the underlying rock type.

The Ecological zones of Nakuru County are strongly influenced by the climatic conditions and physical features. The Mau Escarpment with an average altitude of 2,400m above sea level is very important as most of the forests are located on it. It is also the source of Njoro River that drains into Lake Nakuru which is inhabited with flamingos, and among the tourist attraction sites in Kenya.

The forests in Nakuru County viz-a-vis, Menengai Crater, Mbogoini, Solai, Mau, Bahati, Subukia, Eburru and Dundori) are a major source of timber and firewood as well as providing employment to high number of the county population. The same forests generate income for the government in form of revenue from saw millers. The forest and the high altitude also influence climate condition in the county resulting to wet conditions suitable for agro-based economic activities.

Underground hot springs in Olkaria are an important source of geothermal power that serves not only the county but also provides power supply to the national grid. The County is characterized with Latosolic soils; Planosolic soils and alluvial and lacustrine deposits. The resources, if exploited in an optimal and sustainable manner, will propel the County to attaining the SDGs and Vision 2030.

Climatic Conditions

The climate of Nakuru County is strongly influenced by the altitude and physical features. There are four broad climatic zones as shown in the figure 2 below:

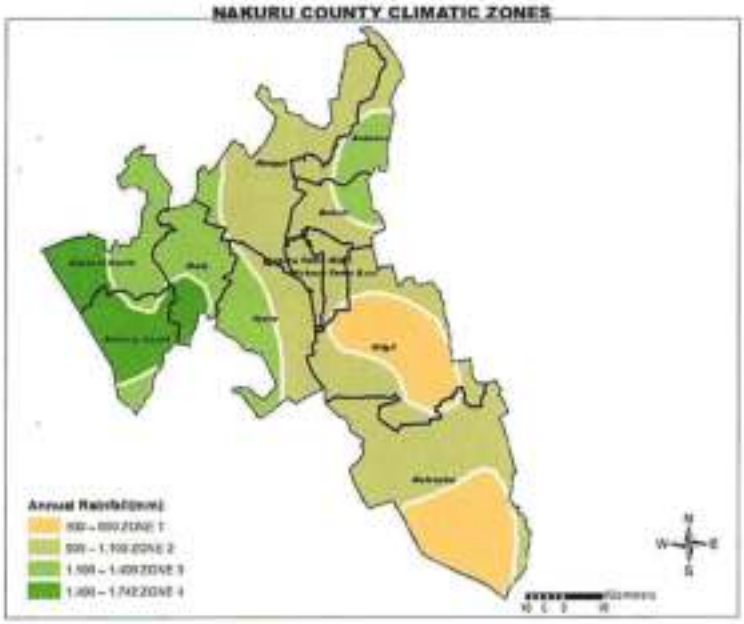

Figure 6: Nakuru County Climatological Zones

Zone 1 has lowest mean annual amount of rainfall of about 500-800mm per annum. This

zone is predominantly experienced in Gilgil and Naivasha sub-counties.
Zone 2 occupies most parts of Nakuru County with a general elevation of between 900M and 1800m amsl.
Zone 3 receives rainfall of between 1100 and 1400 mm per annum and covers areas with an altitude of between 1800-2300m above sea level. This zone covers much of the sub-counties of Kuresoi North, Molo, Njoro, Subukia and Bahati and are very suitable for agricultural activities.
Zone 4 covers areas with an altitude between 2300m and 2700m above mean sea level (amsl), receiving rainfall of over 1400mm per annum. This zone covers Mau Escarpment that is parts of both sub-counties of Kuresoi North and South.

4.2.4. Biodiversity

There are eight gazetted forests in the County covering 69,663ha. These are; Mau Complex, Bahati forest, Dundori forest, Eburru forest, Menengai forest, Part of Aberdare forest, Sururu forest and Bararget Forest.

Mau complex is a major water tower that benefits several counties in the country as well the neighbouring country, Tanzania. There has been continuous destruction of forests across the County and this has affected the ecosystem and intensive reforestation programmes will be undertaken to ensure that these forests are preserved for sustainable use.

Forests and related forestry activities contribute to improved agricultural productivity, protection of water catchment areas and provide raw material for the timber industry. The current forest cover for Nakuru is approximately 9 percent.

Although there is a significant forest cover in Nakuru County due to the Mau Forest, there are also large areas which have little tree cover. In addition, the Mau forest was previously seriously threatened by planned excision of land for settlement and excessive harvesting of trees without replanting. Water catchment areas in the county are being rehabilitated. Farmers are also being encouraged to adopt agro forestry.

Black and white rhinos thrive in the surrounding national parks, which also has its fair share of Cape buffalos, African wild dogs, Zebras, Elands, Waterbucks, Baboons, Velvet Monkeys, Columbus Monkeys, Giraffes, Impalas, Thomson Gazelles, Bush Bucks, Reed Bucks, Warthogs, Lions and flamingos on the shores of Lake Nakuru and Lake Elementaita. Recently there has been increased number of Leopard sightings and the rare Rothschild's Giraffe.

4.2.5.Economic sectors

Livestock Production

Livestock production is one of the major economic activities undertaken in the County. The main livestock reared include; dairy cattle, poultry, sheep, goats and rabbits. Dairy and meat production are the main income earners. Milk production has been boosted by the availability of major milk processing companies that purchase milk directly from the farmers' co-operatives. The companies include Kenya Cooperative Creameries (KCC), Brookside among others.

Crop production

The main crops produced include; maize, beans, Irish potatoes, sweet potatoes, vegetables, herbs, spices fruits and cut flowers. During the period 2014/15 the County produced the following; maize 2,168,656 (90 kg bags), beans 96,347 (90kgbags), Irish potatoes 255,196 MT, sweet potatoes 2,845 MT and horticultural crops in (MT) are 534,837 various vegetables which include tomatoes, carrots, onions, French beans, cabbages, kales, asparagus and leeks, herbs/spices, 8,961fruits and cut-flowers.

The Blue Economy

Blue Economy means the use of the sea and its resources for sustainable economic development. In Nakuru the aspects of Blue Economy entails; fisheries, tourism, sport fishing and boat riding within Lake Naivasha.

Aquaculture

Fish farming in Nakuru County involves production of fish in fish ponds which are earthen, cemented or lined as well as fishing in Lake Naivasha. Some are practicing emerging technologies like raised ponds and aquaponics. There are a total of 1,524 ponds constructed in the County. The County continues to provide fish farming extension services to encourage the uptake of this initiative. Fisheries play an important role in the economy of Nakuru County by providing food security and employment. The major fishery activities carried out in the County include; fish farming (aquaculture), in-land capture in Lake Naivasha, River Malewa and public and privately-owned dams.

Lake Naivasha fishing activities supports about 704 fishermen (holding about 176 boats, 1,760 fishing nets of 4 inches mesh size), and more than 3000 people indirectly. The main species of fish caught in the County is Common Carp and Tilapia although there are other species caught but on small scale like the Cray fish.

Marine transport and tourism

Boat riding activities along Lake Naivasha are provided by the lodges along the Lake as well as licenced boat riders who provide the services on the public beaches. This gives both local and international tourists a view of different wildlife and birds e.g. fish eagle found in the lake.

Micro, Small and Medium enterprise (MSME)

MSMEs have been identified under the Kenya Vision 2030 as a key driver in the provision of goods and services enhancing competition, fostering innovation, generating employment hence alleviating poverty.

The 2016 National MSME Survey indicated that there were a total of 118,200 licensed and 257,900 un-licensed MSMES in Nakuru County. Further a large proportion of these, at 47.9 percent of the licensed MSMEs are owned by males while 32.2 percent are owned by females.

Tourism Activities

Nakuru County is among the counties with a large inflow of tourists from within and outside Kenya. The county boasts of major flora and fauna that attract tourists. The National Parks are the major tourist attractions in the County. These are; Lake Nakuru National park, Hells Gate National Park and Mt. Longonot National Park. Other tourist sites include; Menengai Crater, Subukia Shrine, Lord Egerton Castle, Lake Naivasha, Lake Elementaita, Hyrax hill prehistoric site, Ol-doinyo Eburru volcano and Mau forest.

Other private wildlife conservancies that attract tourists include; Marura, Oserian and Kedong in Naivasha sub-County and Kigio and Soysambu in Gilgil sub-County.

The main tourist activities include; bird watching, hiking, picnics, excursions and game drives. The Tourism Regulatory Authority (TRA) categorises hotel establishments into five categories namely; town hotels, lodges and tented camps, vacation hotels, villas cottages and apartments. The following are available in Nakuru County; town hotels 40, lodges 10 and one tented camp. The total bed occupancy for the classified establishments is approximately 1300 beds. The County has two 2-star hotels, four 3-star hotels, three 4-star hotels and one 5-star hotel.

4.2.6.Transport infrastructure Development

Kenya's Vision 2030 has identified infrastructure as an enabler and foundation for socio-economic transformation. The County's infrastructure facilities include road network, rail network, airstrips, ICT, housing among others.

Roads and Railway Network

i. Road network

The entire road network in the Nakuru County is approximately 12,491km. Out of which paved roads are 993.7 Km and gravel roads are 4,500 Km and earth roads are 6998Km. The road infrastructure can be described as 20% good, 35% fair and 45% poor.

Some roads especially in agricultural rich areas including Kuresoi North and South, Molo, Njoro Subukia, Naivasha and Gilgil are still in deplorable condition hence leading to delays in transporting of agricultural produce to the market making farmers to incur losses for perishable goods. This situation is set to be improved in the plan period by opening up of more feeder roads.

The proposed dualing of the Nairobi- Nakuru Highway will ease traffic on the A104 road since this is a major highway connecting Kenya to Uganda, Rwanda, South Sudan and Democratic Republic of Congo (DRC).

ii. Rail Network

The old MGR line traverses through the County to Uganda which transports cargo mainly from the port of Mombasa to Malaba border. The Standard Gauge Railway (SGR) passes through Mai Mahiu (Naivasha) as it joins Narok County. Further implementation of SGR Phase 2A is complete and handed over to KR, currently operational. The ICD in Naivasha as a result of the SGR is expected to boost economic activities in the County. The ICD and

MGR line rehabilitation will supplement and reduce congestion along Nairobi – Malaba highway (A104/A8) and Nairobi Inland Container Depot (ICD) which is currently in operation.

iii. Airport and Airstrips

Currently, the County does not have an existing airport. However, there are plans for expansion of the airstrip at Lanet Military Base for commercial services. This will improve economic integration with the rest of the nation and open international market for products within the County including direct export of horticulture and floriculture.

4.3. Baringo County

4.3.1. Location, Administrative units and Size

Baringo County is situated in the Rift Valley Region and shares borders with 8 counties namely, West Pokot to the North West, Turkana to the North, Samburu to the North East, Laikipia to the East, Nakuru to the South, Kericho and Uasin-Gishu Counties to the South West, and Elgeyo-Marakwet to the West. The County is divided into 6 Sub-Counties, namely Baringo South, Mogotio, Eldama Ravine, Baringo Central, Baringo North and Tiaty being the largest sub county with an area of 4540 square kilometers. It has 30 Wards and 116 Locations.The County Government Act established the Village Administrative Units as the lowest administrative units in the Counties but are yet to be created in Baringo County.

It is located between longitudes 35 30' and 36 30' East and between latitudes 0 10' South and 1 40'. The Equator cuts across the county at the southern part. Baringo covers an area of 11,015.3 sq km of which 165 sq km is covered by surface water from Lake Baringo, Lake Bogoria, and Lake Kamnarok.

4.3.2. Population

The county's population was 666,763 in 2019 with 336,322 males, 330,428 females and 13 being intersex, according to the KPHC- KNBS statistics of 2019.

4.3.3. Physiographic, climate & hydrology

Topography

One of the prominent features is the Kerio Valley, which is situated on the western part of the county. In the eastern part of the county near Lake Baringo and Bogoria is the Loboi Plain covered mainly by the latchstring salt-impregnated silts and deposits. The Tugen Hills form a conspicuous topographic feature in the county. The trend of the hills is north-south and mainly consists of volcanic rocks. The hills have steep slopes with prominent gullies. On the eastern and western parts of the hills are escarpments. Rivers on the hills flow in very deep gorges. The floor of the Rift Valley owes its origin to the tectonic and volcanic disturbances, which have dislocated surfaces, forming separate ridges. The troughs of the rift that have a north-south alignment are occupied by Lake Baringo and Bogoria, which occupy 164 Km2. Lake Bogoria is particularly spectacular because it is one of the few hot, salt water lakes in the world and is the breeding ground for flamingoes. Lake Baringo is a fresh water lake which is the home of crocodiles and hippopotamus. Lake Kamnarok an ox-bow lake covers 1 Sq. Km, and a home of elephants and crocodiles. It is also located in the larger Rimoi game reserve which occupies Baringo and Elgeiyo Marakwet counties.

The rainfall varies from 1,000mm to 1,500mm in the highlands to 600mm per annum in the lowlands. Due to their varied altitudes, the sub-counties receive different levels of rainfall.

Koibatek sub-county receives the highest amount of rainfall. The lowland sub-counties of Mogotio, East Pokot and Baringo North receive relatively low amounts. The temperatures range from a minimum of 10°C to a maximum of 35°C in different parts of the county. Average wind speed is 2m/s and the humidity is low. The climate of Baringo varies from humid highlands to arid lowlands while some regions are between these extremes.

4.3.4. Ecological Conditions

Exotic forests exist in the county but the known indigenous forests are found in Kabarnet, Kabartonjo, Tenges, Lembus, Saimo, Sacho and Ol' Arabel and Eldama Ravine. The main exotic species are: Grevillea Rabusta, Cuppressuslusitanic and Eucalyptus saligna. Prosopisjuliflora also exists in Marigat area.Kipng'ochoch forest in Sacho, one of the 10 forest blocks under Tenges forest station, is an example of a well conserved indigenous forest where visitors and nature lovers could view the entire Lake Baringo basin, fluorspar mines, Laikipia ranges, Elgeyo escarpment, Kerio Valley and other touristic attractions that the county offers.The county is classified as arid and semi-arid. Most parts of East Pokot, Baringo Central, Baringo South, Baringo North, Mogotio sub-counties are arid and semi-arid except for Koibatek sub-county, which is in a highland zone. Rainfall ranges between 300 mm and 500 mm, decreasing from south to north.

4.3.5. Climatic Conditions

The rainfall varies from 1,000mm to 1,500mm in the highlands to 600mm per annum in the lowlands. Due to their varied altitudes, the sub-counties receive different levels of rainfall. Koibatek sub-county receives the highest amount of rainfall. The lowland sub-counties of Mogotio, East Pokot and Baringo North receive relatively low amounts.

The temperatures range from a minimum of 10°C to a maximum of 35°C in different parts of the county. Average wind speed is 2m/s and the humidity is low. The climate of Baringo varies from humid highlands to arid lowlands while some regions are between these extremes.

4.3.6. Economic sector

Trade and Industrialization are important economic activities in Baringo County. These two thematic areas have so many informal entities that contribute to the County revenue base. These two thematic areas require transformation in order to sustainably develop. The three formal industries in the County which include:

a. Salawa Cotton Ginnery in Salawa.
b. Goldox slaughter house in Mogotio,
c. Abattoir in Mogotio.

There are also two existing industrial zones in Kabarnet and Eldama Ravine, a planned industrial zone in Marigat and Mogotio. There are two operating coffee processing factories at Kituro and Kapkawa. Honey processing on a small scale happens at Koriema, Radat (KBS approved) and Kapimoi. Several slaughter houses are being constructed in Barwessa, Maoi and Loruk. Mineral extraction also takes place in Tenges and Tiaty.

4.3.7. Infrastructure Development

Roads and Rail Network

A modern and well-maintained physical infrastructure is a key catalyst to economic growth and poverty reduction. The county does not have a good road network. It has a total 5,943.92km of road with Class B, D, E, G, R and U having 66.4km, 339.22km, 1810km,

46.85km, 1,538.08km, and 2043.37km respectively. The roads are mainly earth and mixed type. These roads are usually impassable during the rainy season. The road transport network is challenged by uneven topography which makes it expensive to construct and maintain access roads. This impedes livestock marketing business commuting, which is the main source of livelihood for majority of the residents. There are four airstrips in the county and no airport, ports or jetties.

Baringo County is endowed with many wide spread tourist attraction sites across the County with accessibility challenges but with many mapped airstrips and airfields. Most of these airstrips and airfields are undeveloped with only Kabarnet airstrip having a tarmacked runaway. There are several helipads in all the sub-counties though not officially gazetted. All landings are at the discretion of the pilots. These include school playfields, forest glades, bare hilltops and open grasslands.

The county has several km of railway line on its southerly boarder with three railway stations namely: **Makutano, Majimazuri** and **Equator**. However, they are underutilized. There is need for the county to collaborate with Kenya Railways and other stakeholders to service and operationalize the railway to boost the county's economy.

4.3.8. Energy Access

The county is endowed with significant amounts of renewable energy resources such as wind, solar, geothermal, small hydro and biomass. If harnessed, these resources can play a significant role in the country's energy supply mix. The county has a great significant potential in solar, geothermal and wind the department will take steps in promotion, development and utilization of renewable energy resulting in an increase in the contribution to national grid.

The Sub-Sector is responsible for Renewable Energy Promotion and Development; Thermal Power Development; Oil and Gas Exploration; Oil/Gas and Minerals sector capacity development; Rural Electrification Programme; Energy Regulation, Security and Conservation; and Fossil Fuels Exploration and Development. Mobilize resources for research and development of alternative energy sources.

Electricity connections in the county are just above 9.6% of the County Population. This situation is rapidly changing as the County in collaboration with the National Government invests more resources in power generation, transmission and distribution through its last mile programme. The County is still below the national averages in the renewable improved energy sources.

4.3.9. Land and Land Use

Land, sometimes referred to as dry land, is the solid surface of the earth that is not permanently covered by water. Most human activities occur on land which supports agriculture, vast habitats and natural resources. Baringo County with a total land area of 11,015 square kilometres, has total arable land of 4, 435, total non-arable land of 5, 700 and total urban area land of 715 square kilometres of Land.

4.3.10. Water Sources

The sources of water in the county include dams, lake, water pans, streams, wells, springs and boreholes. They may be piped water or point sources. Water from vendors, especially in urban centres and small market centres, constitute a small percentage. The average distance to the nearest water point is 5km.

4.3.10 Sanitation

Most of the population does not have access to good sanitation. Households using bushes to relieve themselves constitute 49 per cent while 46 per cent use pit latrines. Only five per cent of the population has access to proper sanitation.

There is no sewerage plant in all the towns and trading centres in the county. This poses a major health and pollution hazard among the residents of Baringo.

4.4. Uasin Gishu County

Uasin Gishu County was created in 2010 upon the promulgation of the Constitution of Kenya. The name uasin gishu comes from the word Illwuasin-kishu, a Maasai clan name. It is however believed that a pastoral tribe called the Sirikwa was the first occupant of the land before they were dislodged by the Maasai who were later ousted by the Nandi in a battle fought at Kipkarren in the 19th century. The Nandi used the plateau as their grazing land until it was alienated for white settler occupation in 1905 when they were expelled to the Nandi reserve. But it was not until 1907 and 1908 when settlement in Uasin Gishu began with a major trek of Afrikaans-speaking arriving from South Africa. The colonial government later established an administrative centre in the area in 1912 at the present day Eldoret Town.

4.4.1. Location and Size

The County is located in the North Rift region of Kenya. The County has partnered with seven other counties in the region namely Elgeyo Marakwet, Nandi, Transnzoia, Baringo, Turkana, Samburu and West Pokot to form an economic bloc referred to as the North rift Economic Bloc (NOREB) which intends to bring long term social and economic benefits to the residents of the region.

Uasin Gishu County has its headquarters in Eldoret town. The County extends between longitudes 340 50' east and 350 37' east and latitudes 00 03' South and 00 55' North. The County shares common borders with Trans Nzoia County to the North, Elgeyo Marakwet County to the East, Baringo County to the South East, Kericho County to the South, Nandi County to the South West and Kakamega County to the North West. It covers a total area of 3,345.2 Km^2.

4.4.2. Population

The county's population was reported to be 1,163,186 in accordance with the 2019, Kenya Population and Housing Census with 580,269 males, 582,889 females and 28 being intersex.

4.4.3. Physiography, climate & hydrology

Uasin Gishu County is a highland plateau. Altitudes fall gently from 2,700m above sea level at Timboroa in the East to about 1,500m above sea level at Kipkaren in the West. The County can be divided into two broad physiographic regions, with Eldoret (2,085m) forming the boundary between the regions. The topography is higher in the east and declines towards the western borders. The plateau terrain in the County allows easier construction of infrastructure such as roads and use of modern machinery for farming.

The County is within the Lake Victoria catchment zone and therefore all the rivers from the County drain into Lake Victoria. Major rivers in the County include: Moiben, Sergoit, Kipkarren, Chepkoilel and Sosiani. The rivers provide water for livestock, domestic and industrial use.

The County experiences a high and reliable rainfall with an average annual rainfall ranging between 624.9mm-1560.4mm. It occurs between the months of March and September withtwo distinct peaks in May and August. The areas with relatively higher rainfall are found in Ainabkoi, Kapseret and Kesses whereas Turbo, Moiben and Soy receive relatively lower amounts of rainfall. The dry spells starts in the month of November and end in February. Average temperatures range between 70C and 290C. The rainfall and temperatures in the County are conducive for both agriculture and livestock farming.

4.4.3.1. Ecological Conditions

The County is divided into three zones namely: the upper highlands, upper midlands and Lower highlands. These zones have greatly influenced the land use patterns in the County as they determine the climatic conditions of an area. The geology of the County is dominated by tertiary volcanic rock, with no known commercially exploitable minerals.

There are four main soil types in the County; red loam, red clay, brown loam and brown clay soils. The red loam soils are found mainly in the northern part of the County in Turbo, Moi's Bridge and lower Moiben and this type of soils mainly supports maize, sunflower, and cattle farming. The red clay soils occur around Soy, upper Moiben, and Nandi border areas and they support wheat and maize growing, and the natural vegetation is similar to that of the areas with red loam soil. The brown clay soils occur mainly on the plateau and cover most of the upper Lessos plateau areas and are good for rearing livestock. Deep brown loam soils occur in high altitude areas of the County around Ainabkoi and Kaptagat that are good for forestry, dairy farming and wheat, pyrethrum, potato, oat and barley farming.

4.4.4. Economic sectors

The main economic activity in the County is agriculture both crop and livestock farming attributed to the County's rich fertile soils and favorable climatic conditions. Other economic activities include wholesale and retail trading and manufacturing. The County is also a commercial hub in the region providing transport, financial and educational services.

4.4.5. Land and Land Use

The average land holding size in the County is 5Ha. in rural areas and a 0.1Ha. within Eldoret Town and other major towns. The average farm sizes for small scale farming is 3Ha

while for large scale farming is approximately 50Ha. Most of the land holding in the County is private with about 95 per cent of the entire land with title deeds. The type of land tenure in the County is 90 per cent freehold and 10 per cent leasehold.

4.4.6. Water and Sanitation

The main water resources are dams, rivers, boreholes, shallow wells and springs. There are 250 dams and pans constructed during the colonial period and mostly silted; and five major rivers namely Moiben, Sergoit, Kipkarren, Chepkoilel and Sosiani. There is also abundant good quality ground water that is a major source of water for the rural population who draw water from shallow wells, hand dug wells and springs.

The County has seven gazetted water schemes: Turbo, Moi's Bridge, Burnt Forest, Sambut, Sosiani, Kipkabus and Eldoret Water and Sanitation (ELDOWAS). Of the seven, six are run by the County government while ELDOWAS is managed as a public company. There is also Ngeria water scheme which is ungazetted and 260 community water supplies spread across the County. The current total water production for Eldoret and its Environs is 36,000 M3 per day which is below the current demand of about 60,000 M3 per day. The County in conjunction with Lake Victoria North Water Services Board is currently developing Elgarini Water Project that will provide an additional 9,000 M3 per day. There are also plans to develop Kipkaren water treatment plant that will provide an additional 24,000M3 per day.

The average distance to the nearest water point in the rural and urban areas of the County is approximately 500m – 1Km and 0-500m respectively; meaning anyone in the County does not have to spend a disproportionate part of the day fetching water for the family's needs. This distance can be reduced further if appropriate water supply and management strategies are initiated. The County is also expected to desilt dams, restore water towers and conserve water catchment areas.

Waste disposal in towns and urban centres remains a challenge despite efforts made by the County and thus a recipe for environmental degradation and pollution. The lack of proper sewer system in towns and urban centres and management of solid waste also poses major sanitation challenges. There is need to improve waste disposal by provision of sewerage systems, solid waste disposal sites, waste storage systems, establishing of a recycling plant at Kipkenyo dumpsite, among other interventions.

4.4.7. Health Access and Nutrition

There are 119 public health facilities in the County: one referral hospital; 8 hospitals, 16 health centres and 19 dispensaries owned and manage by the County Government. There are also 52 privately owned health facilities in the County: 9 private hospitals, 2 Faith Based Organization (FBO) hospitals, 2 private health centres, one Non Government Organization (NGO) health centre, one NGO dispensary, 7 private dispensaries and 33 private clinics. There are also two health facilities managed by the national government. The doctor-patient and nurse-patient ratios in the County currently stands at 1:36,099 and 1:2159 respectively, which is higher than the recommended ratios of 1:10,000 and 1:450 in that order? Access to quality health care services in the rural areas has increased due to construction of new health facilities, rehabilitation of existing ones and equipping.

4.4.8. Infrastructure Development

Road and Railway Line

The County has an extensive road network comprising 450 Km of bitumen surface, 1946 Km of gravel and 2,450 Km of earth surface. The Eldoret International Airport is located within the County and two airstrips in Eldoret town and Sergoit. The County also has a railway line traversing through with eight railway stations namely; **Timboroa, Ainabkoi, Tumeiyo, Kaptagat, Plateau, Eldoret Turbo and Kipkaren**. Major roads traversing the County include; A8 (Timboroa – Kipkaren) which forms part of the Northern Corridor linking Kenya with the rest of East and Central Africa; C51 (Eldoret – Iten), C 54 (Eldoret – Kaptagat), C39 (Eldoret – Kapsabet), B2 (Eldoret – Kitale), D328 (Eldoret – Ziwa – Kitale), which link the County with the neighboring counties of Elgeyo Marakwet, Nandi and Trans Nzoia. There are four main bus parks in Eldoret town namely; Sosiani, Iten, Tagore and Main Bus Park and two main lorry parks at Maili Nne and Jua Kali. This makes the County a regional transport and service hub. Further improvements on existing and development of new facilities will play a significant role in the economic development of the County.

Information Communication and Technology

The County enjoys a well-connected fibre optic infrastructure and good coverage of mobile broadband and voice network from a number of service providers. The entrance of more market players has significantly brought down the cost of access to Internet services. There are 16 postal offices spread across the County, nine licensed private courier service providers and an operational Huduma Centre.

Energy

The proportion of households in the County using lighting in form of electricity generated from the main grid is 49.9 per cent; while 23.4 per cent uses solar energy, 22.9 per cent paraffin and the remaining other sources. On the main source of cooking fuel, majority of households (44 per cent) rely on firewood; 27.3 per cent on charcoal; 13.7 per cent on kerosene; and 9.6 per cent on Liqufied Petroleum Gas (LPG). There is need to connect more households especially in the rural areas with electricity, as well as public institutions and trading centres. The use of firewood and charcoal in most households as the main source of cooking fuel may lead to respiratory diseases due to indoor air pollution and therefore there is need to promote use of clean sources of energy such as LPG and biogas in the County.

Housing

Slightly more than half of the households (50.1 per cent) in the County reside in their own dwellings with majority (81.1 per cent) having constructed the dwellings themselves. The proportion of households renting or leasing dwellings in the County is 44 per cent and mostly in urban areas.

On building material of dweling units, 94.3 per cent of households had dwelling units with roofs made of corrugated iron sheets while 47.6 per cent of households had dwelling units with walls made of mud. There is need to increase supply of housing units in the County especially in the urban areas where the demand is high through promotion of cheaper building technologies and financing for more people own homes.

4.5. Bungoma County

Bungoma County Government was established in 2013 as per the Constitution of Kenya 2010 which provides for the two levels of government. The County historically is inhabited by the Bukusu, Tachoni, Batura, Sabaot, Iteso and other Kenyan communities who reside side by side in peace. The County is generally cosmopolitan and has good representation of both local and foreign expatriates. Some of the notable achievements attained during this period included: a robust cooperative movement, which was a role model for the country and the railway stations at Webuye, Sudi, Bungoma and Myanga which revolusioned the transport system in the County. Today with devolution, we can built and expand on these developments.

4.5.1. Location and Size

The County lies between latitude 00 28' and latitude 10 30' North of the Equator, and longitude 340 20' East and 350 15' East of the Greenwich Meridian. The County covers an area of 3032.4 Km^2. It boarders the republic of Uganda to the North west, Trans-Nzoia County to the North-East, Kakamega County to the East and South East, and Busia County to the West and South West.

4.5.2. Population

The county's population was reported to be 1,670,570 in accordance with the 2019, Kenya Population and Housing Census with 812,146 males, 856,389 females and 35 being intersex.

4.5.3. Physiography, climate & hydrology

The major physical features include Mt. Elgon, several hills (Chetambe, Sang'alo and Kabuchai), rivers (Nzoia, Kuywa, Sosio, Kibisi and Sio-Malaba/Malakisi), waterfalls such as Nabuyole and Teremi. Mt. Elgon and Sang'alo hill have attractive caves. The altitude of the County ranges from over 4,321m (Mt. Elgon) to 1200m above sea level. The County has only one gazetted forest, the Mt. Elgon forest reserve which measures 618.2Km^2, and one National park, which measures 50.683 Km^2.

The County experiences two rainy seasons, the long rains of March to July and short rains - August to October. The annual rainfall in the County ranges from 400mm (lowest) to 1,800mm (highest). The annual temperature in the County vary between 0°C and 32°C due to different levels of altitude, with the highest peak of Mt. Elgon recording slightly less than 0°C. The average wind speed is 6.1 km/hr. In the last decade, the County experienced increasing variability in rainfall and temperature patterns that have influenced changes in agricultural seasons.

4.5.4. Ecological Conditions

The County environment supports a complex pattern and balance of relationships between plants, animals, people and manmade features. These complex interactions lead to different selective pressures on organisms, leading to natural selection which causes population of species to evolve. Variation in nutrients and accumulation of toxins due to human activities have affected the ability of the environment to support life systems. Mt. Elgon forest

ecosystem supports diverse life systems contributing immense goods (fruits, tubers, medicinal herbs, game meat, timber, logs, poles, firewood, fodder etc) and services (shed, pollination, decomposition, evaporation, absorption of CO_2, nutrient formation, recreation, spiritual and cultural values etc).

The expanding County population accompanied by increasing agricultural activities have reduced spaces for fauna and flora. Excessive use of artificial fertilizers for instance has affected soil nutrients, insects and certain bacteria niches thereby affecting nitrogen conversion for plants, leading to variability in yields. These and other related processes have led to co-evolution where species evolve in response to each other as seen from bees and the flowers they pollinate to predators and the prey they eat.

4.5.5. Economic sectors

Main crops produced include maize, beans, finger millet, sweet potatoes, bananas, sorghum, Irish potatoes and assorted vegetables. Sugar cane, cotton, palm oil, coffee, tea, sun flower and tobacco are grown as cash crops in the County. The area under food crops is 201,654.6 ha, while that under cash crops is 86,423.4 ha. Nzoia Sugar Company has about 50,000 hectares of land under sugar cane. Most of the agricultural activities are rain-fed, meaning that farmers only Plant during the rainy seasons. It is therefore important for efforts to be directed towards diversification from agriculture to other economic activities, while also embracing irrigation and green house farming technologies so as to boost food productivity.

The County is dominated by micro and small business enterprises and has over 350 market centres of different sizes spread all over.

The County has a number of classified hotels and restaurants that makes up the hospitality industry. However, demand for modern hotels and restaurants surpass the supply, hence the need for PPP initiatives to fill the gaps in the sector.

The main factories and industries in the County include; Nzoia Sugar Company, Rai paper, Malakisi Tobacco Leaf Centre, Webuye Heavy Chemicals Industry, Kitinda Dairy, Musese and Chesikaki coffee factories. They rely on raw materials produced locally. In the medium term, efforts will be made to sustain production of raw materials to enable industries operate optimally.

A significant proportion of the MSMEs are formal, while majority fall within the informal economy based on their size, location, ownership, status of formality and economic activity. The sub-sector produces a significant share of total value added, and provides a large segment of the poor and middle-income populations with affordable goods and services.

The County has an increasing number of financial institutions, namely, Kenya Commercial Bank (KCB), Equity, Family, Cooperative, National, Diamond, Bank of Africa, Post Bank, Standard Chartered and Barclays bank. Micro-Finance Institutions include; Sidian bank, Kenya Women Finance Trust (KWFT), and Faulu. Insurance services are offered by the leading providers in the Country. Mobile and agency banking have enhanced access to financial services.

The County has mining potentials in the following areas; sand harvesting, murram/gravel, quarrying for ballast, stones and clay.

4.5.6. Land and Land Use

Land is a natural resource which is fixed in supply and yet its demand is ever increasing. The County has 2,880.78 Km^2 of arable land. Land uses include: Agriculture, forestry, mining, human settlements, business, social and public amenities. Land is also used as collateral to obtain credit as well as for aesthetic purposes.

4.5.7. Infrastructure Development

In today's global economy, modern and efficient infrastructure and services are a necessary precondition for successful and sustainable economic growth.

Road Network

The Mombasa – Nairobi – Eldoret – Webuye – Malaba highway (A104) traverses through the County. It is a major link road for trade and commerce. The Webuye - Kitale highway (A1) has recently undergone re-construction, thereby positioning the County as the desired destination for attracting and retaining investment. Some of the major road works undertaken by the national government in the County include: Webuye-Kitale (59km), Musikoma-Buyofu-Mungatsi (ongoing), Lwakhakha- Korosiendet-Tulienge-Sirisia-Namwela-Chwele (ongoing), Musikoma – Sang'alo – Lurambi (ongoing).

Airstrips

The County has two underutilized airstrips in Webuye and Bungoma Towns. It is proposed that the latter airstrip, in consultation with the national government, be converted into a recreational or Small Medium Enterprises (SME) park.

Posts and Telecommunications

The County is served by a network of post offices and sub-post offices in all the major urban areas. Private couriers, namely G-4S Security, Wells Fargo and a number of public service vehicle couriers also operate in the County. There are several mobile phone and internet service providers including Safaricom, Airtel-Kenya, Telkom-Kenya, Jamii Telkoms and Liquid Telkoms.

Energy Access

Installed capacity

In 2016, the country had 2,325.8 MW. This was composed of; hydro (818.2 MW), thermol oil (803.5MW), geothermal (652 MW), wind (26.1 MW) and cogeneration (26 MW). In Bungoma County, 4.5% of the households have access to electricity. With the expansion of the Rural Electrification Programme (REP), more households will be covered.

Housing

The County housing is composed of a mix of units differentiated by cost, usage and material types. The dominant construction materials for floor are earthen; walls are mud and roofs corrugated iron sheets. Locally available construction materials include; sand, bricks, stones,

timber, logs, nails and corrugated iron sheets. The demand for housing in the County outstrips the supply.

Water supply and Sanitation

Access to safe drinking water is a basic necessity for human wellbeing. The County water resources are predominantly rivers and underground water sources.

There are four urban and six rural water supply schemes in the County. Urban schemes are mainly piped and are operated by Lake Victoria North Water Services Board through the water service provider - Nzoia Water and Sanitation Company. Rural water schemes are operated by the County Water Department through its field water officers. The water service provider relies on expensive pumping systems to distribute water to customers. The overhead costs of these systems reduce the efficiency and effectiveness in water service provision.

According to Multiple Indicator Cluster Survey of 2015, 87 percent of the population in the County uses an improved source of drinking water – 96 percent in urban areas and 79 percent in rural areas. The average distance to the nearest water source is 0.2km down from 1.5 km in the year 2013 in rural areas and 0.2km down from 0.5 km in 2013 in urban areas. Most households in rural areas depend on individual piped, roof catchment and communal water points such as boreholes, springs and wells.

In Bungoma County, 67 percent of the population has improved sanitation facilities. This percentage is 79 in urban areas and 57 percent in rural areas. Overall, half of the population use an improved sanitation facility. Improved sanitation can reduce diarrheal disease by more than a third, and can significantly lessen the adverse health impacts of other disorders responsible for death and disease among thousands of children in the County.

4.6. Kakamega County

4.6.1. Location and Size

Kakamega County is located in the Western part of Kenya and borders Vihiga County to the South, Siaya County to the West, Bungoma and Trans Nzoia Counties to the North and Nandi and Uasin Gishu Counties to the East. The County covers an area of 3,051.3 Km^2.

4.6.2. Population

The county's population was reported to be 1,867,579 in accordance with the 2019, Kenya Population and Housing Census with 897,133 males, 970,406 females and 40 being intersex.

4.6.3. Physiography, climate & hydrology

The altitudes of the county ranges from 1,240 metres to 2,000 metres above sea level. The southern part of the county is hilly and is made up of rugged granites rising in places to 1,950 metres above sea level. The Nandi Escarpment forms a prominent feature on the county's eastern border, with its main scarp rising from the general elevation of 1,700 metres to 2,000

metres. There are also several hills in the county such as Misango, Imanga, Eregi, Butieri, Sikhokhochole, Mawe Tatu, Lirhanda, Kiming'ini hills among others.

The annual rainfall in the county ranges from 1280.1mm to 2214.1 mm per year. The rainfall pattern is evenly distributed all year round with March and July receiving heavy rains while December and February receives light rains. The temperatures range from 18 0C to 29 0C. January, February and March are the hottest months with other months having relatively similar temperatures except for July and August which have relatively cold spells. The county has an average humidity of 67 percent. Since the early 1960s both minimum (night) and maximum (day) temperatures have been on a warming trend throughout Kenya. Current projections indicate increases in temperature.

Recent trends show a marked increase in inter-annual variability and distribution of rains, with an increase in the number of consecutive dry days and shorter but more intense periods of rainfall resulting in an increase in frequency of floods. Future climate change may lead to a change in the frequency or severity of such extreme weather events, potentially worsening impacts. Increased average temperatures and changes in annual and seasonal rainfall will be felt across key economic sectors, such as agricultural production, health status, water availability, energy use, infrastructure, biodiversity and ecosystem services (including forestry and tourism). Impacts are likely to have disproportionate effects on the poor as such groups have fewer resources to adapt to climatic change and vulnerability.

4.6.4. Ecological Conditions

There are two main ecological zones in the county namely; the Upper Medium (UM) and the Lower Medium (LM). The Upper Medium covers the Central and Northern parts of the county such as Ikolomani, Lurambi, Malava, Navakholo and Shinyalu that practise intensive maize, tea, beans and horticultural production mainly on small scale; and Lugari and Likuyani where large scale farming is practised. The second ecological zone, the Lower Medium (LM), covers a major portion of the southern part of the county which includes Butere, Khwisero, Mumias East, Mumias West and Matungu. In this zone, the main economic activity is sugarcane production with some farmers practising maize, sweet potatoes, tea, ground nuts and cassava production.

4.6.5. Economic sectors

The two main categories of crops grown in the county are food crops and industrial crops depending on the use of the harvested produce. A third category is horticulture crops (multipurpose). Food crops-are; cereals (maize, sorghum, finger millet, and rice), pulses (beans, peas and grams) or roots/tubers (cassava, s/potato, arrow roots). due to some factors e.g. diseases. Main crops produced are: maize, beans, sweet potatoes, cassava, bananas, sorghum, finger millet, local vegetables, rice, tea, sugarcane and horticulture. Maize production is supported by farm input subsidy, agricultural mechanization programmes. Tea is being promoted in Khwisero, Ikolomani and Shinyalu sub-counties factory construction is underway. The county is promoting upland rice and also rice production under irrigation in Matungu, Mumias and Butere sub-counties.

The County has 239 greenhouses that are underutilized. Banana is the main horticulture crop enterprise and the county has 2,080Ha currently and is promoting establishment tissue culture bananas for commercialization. Women groups have also been trained on horticulture production in local vegetables.

The county has huge unexploited mining potential including gold in Ikolomani, Lurambi, Khwisero and Shinyalu. Mining activities sustain a sizable proportion of the county residents by providing a source of livelihood for people engaged either directly or indirectly in mining. Main mining activities include artisanal gold mining, quarrying, sand harvesting, stone crushing, pottery and brick making.

Gold mining is carried out by artisanal miners in parts of the county including Rosterman in Lurambi, Ikolomani, Khwisero, Shinyalu and Butere. Mining sites are found in private farms, homesteads, riparian reserves, road, and reserves and along river courses. However most of the active mines are found concentrated within the vicinity of abandoned old mines. It is estimated that there are about 5000 people actively engaged in artisanal and small-scale gold mining in the county producing approximately 2kg of gold a week during peak periods.

Kakamega County has one national park, no game reserve and two camping sites which are managed by the National government. The Kakamega Forest is also a big tourist attraction because of the large species of birds, butterflies and other animals' species. Kakamega County has a total area of 244.25 km2 of Gazetted forest. Other tourism activities include bull fighting in Shinyalu and Ikolomani, cock fighting in Shinyalu, the dog market in Lubao, Malava, the crying stone in Ilesi, Lukova in Matete and Mawe Tatu in Likuyani. The county is also rich in cultural practices such as the existing Wanga Kingdom which attracts a number of people to the county.

The County has one national reserve and two camping sites. Kakamega Forest is also a big tourist attraction because of the large species of birds, butterflies and other animals' species the forest hosts.

The County has two star rated hotels; Kakamega Golf Hotel with a bed capacity of 112 and Rondo Retreat at Isecheno in Kakamega forest with a bed of 34, and 24 established bars and restaurants. It also has 540 unclassified hotels.

The county has 187 trading centres with 3021 registered retail traders and 487 whole sale traders. It also has seven established urban centres.

The county is a host to the biggest sugar factory in the Country i.e. Mumias sugar factory. Other sugar factories in the County include, Butali and West Kenya. There exist other small scale industries in the county which are pre-dominantly in the sugarcane growing regions such as the jaggeries, bakeries, small scale milk cold rooms and the fish factory in Kakamega town. There is no industrial park in the county.

Agro-forestry promotes farm forestry products by providing fuel wood, fruits, fodder, shade, medicine timber, soil fertility and erosion protection. This allows trees, crops and livestock to

interact on individual farms to ensure availability of fuel wood, fruits for improved nutrition, fertilizer trees improving soil fertility and fodder trees for improved livestock production.

The natural forests contribute immensely to provision of food to the community. Traditional fruits, roots and vegetables for example Mondia white (Mukombera, Basella, alba (Inderema), are abundant in the forest. Edible mushroom especially termitomyces mushrooms are frequently harvested from the forest for consumption as well as for sale. The community around hunt for wild meat including monkeys, antelopes and hedgehog. So many species of trees and shrubs for example albizzia gummifera, erythrina abyssinica have medicinal value of some tree.

It also presents wonderful opportunity for bird watching, hiking and rock climbing. It is also important to the growing tourism industry and can meet the growing demand for outdoor recreation, nature walks, education and research. Kakamega Forest has many of Africa's most beautiful butterflies providing high potential for butterfly farming and ecotourism. The forests are also used as sites for research and development by a number of institutions such and Masinde Muliro University of Science and Technology.

The potential for economic growth has necessitated major Banks and financial institutions to open their branches in the county. These trends have promoted the provision of wide range of financial services which has positive impact on economic activities of the county.

The county has twelve (12) banks, four (5) micro-credit finance institutions, six (6) SACCOSs with FOSAs that is IG, Wevarsity, Mudete Factory Tea Growers (MUFATE), Nitunze and Sukariand several mobile money agents. The county has one hundred and sixty (164) Cooperatives of which 123 are active and 41 dormant. The cooperatives are as follows: 72 producer, 18 housing, 2 consumer, 1 investment, 8 multi-purpose and 4 union cooperatives.

The major banks with branches in Kakamega county include; Kenya Commercial Bank (KCB), Corporative Bank of Kenya, National Bank, Family Bank, Equity Bank, Standard Chartered Bank, Barclays Bank, Diamond Trust Bank, Bank of Baroda, Commercial Bank of Africa, Post Bank and Spire Bank while micro-finance institutions include; Kenya Women Finance Trust (KWFT), Small Medium and Enterprises (SMEP), Faulu Kenya, Letshego and Starbuck Limited.

There are numerous mobile money agents and other bank agents offering finance services spread across the whole county.

4.6.6. Land and Land Use

Land is a factor of production where all economic and social activities take place. Land its self is static and it's not elastic in supply thus proper use and management is encouraged. Kakamega County has 753,745.5 acres of Land. Out of this, the arable land is 545,806.4 acres, non-arable land is 208, 210.9 acres and urban areas takes 63,011.8 acres

4.6.7. Infrastructure Development

Road Network

Kenya Vision 2030 recognises the need for seamless road network connectivity to spur economic growth through infrastructure development. Despite the progress made in accelerating economic growth, the County still exhibits poor road network in terms of road condition, road expansion and road linkages thereby hindering effective access to the market and reducing mobility of factors of production. In a bid to enhance road connectivity, the county government is committed to improving road network by tarmacking and gravelling of major roads and ensuring frequent maintenance of the roads.

According to the Kenya Roads Board, KRB – RICS (Road inventory and Condition survey – 2015 report and the Kakamega county infrastructure status report (2016) the total inventory of roads in the County is at 4,451.3Km. This includes 2,236.17 Km for gravel, 1,308.90 Km for earth surface and 939.32 Km for narrow unpaved roads. The bitumen and gravel standard roads in the County stands at 307.5 Kilometres and 2,792.25 Kilometres respectively.

Railway Network

The county has 35 km of railway line with two railway stations namely: **Lugari** and **Butere**. However, they are underutilized. There is need for collaboration with the Kenya Railways and other stakeholders to service and operationalize the railway to boost the county's economy.

Airstrips

The county has two air strips, one in Kakamega and the other in Mumias. The strategic position of the county having proximity to the Kisumu and Eldoret International airports which are 60 kilometers and 120 Kilometres respectively presents an opportunity for trade. There is need to upgrade and expand these airstrips.

Information Communication and Telecommunication

ICT is expected to play a big role in the country's economic growth, as envisaged in Kenya Vision 2030. Additionally, Sustainable Development Goal No. 9 clearly identifies technological progress as a way to provide long lasting solutions to both economic and environmental challenges, such as providing new jobs opportunities, promoting industrialization, promoting energy efficiency and investing in research and innovation, all as important ways to facilitate sustainable development.

However, there are many challenges hindering technological progress such as: high cost of mobile/data subscriptions, lack of knowledge and poor quality enforcement among others.
ICT is a major service enabler for Kakamega County development as well as a source of employment for the citizenry especially the youth. The adoption and use of ICT has been on the rise in the county because of the numerous available opportunities but more needs to be done to increase the rate of adoption. Currently Masinde Muliro University of Science and Technology offering training in ICT related areas for Bachelors, and Post Graduate degrees in computer science and IT. Other various post-secondary education institutions are also

offering diplomas and certificates courses in ICT e.g. JKUAT, Sigalagala Polytechnic and various technical institutions both public and private.

The Fibre Optic cable for Internet connectivity has reached Kakamega and covered some areas in the county along the main tarmac road within Kakamega town. A few organizations and institutions along the main road leading and passing through Kakamega town are accessing this. Major ICT companies in Kenya like Safaricom, KDN, Telkom and Access Kenya are currently setting presence in Kakamega. Likewise, major media companies like Nation Media, Standard Group, MediaMax, and Royal Media for TV and radio stations are accessible from Kakamega. The county has MMUST FM radio station.

Mobile telephony in the county enjoys about 85 percent coverage in Kakamega County. The rapid pace of penetration of mobile telephony has led to provision of new products and services, as well as providing breakthrough in sectors such as Health, Agriculture, Education and access to finance. The network for the major service providers in the county such as Safaricom, Bharty Airtel, Orange, Yu are all within the county. There are 94 cyber cafes and others are coming up while there are 1,713 telephone landlines. With the introduction of mobile phones these landlines are declining in their popularity and usage.

Energy Access

Wood is the main source of solid fuel for cooking in the county. According to the Kakamega Multiple Indicator Cluster Survey report 2013/14, 79.2 % of the county population use wood as their main source of energy, 1.1 % use LPG, 0.6 % use biogas, 13.8 % use charcoal and 1.2 % use grass/shrub while cooking as alternative sources of solid fuel.

The Kakamega Statistical Abstract (2015) indicates that a paltry 5.6 % of the county's population use electricity for cooking compared to the country's 22.7 % while a 92.4 % use paraffin for lighting compared to the Country's 69.5 %. In overall, 95.8 % of the household population in the county use solid fuels for cooking against a national figure of 82.5 %.
About 18% of the households have electricity (29 % urban and 6 % rural areas) and a total of 37 electric high masts lights in major trading centres such as Kakamega, Mumias urban areas have been erected.

Renewable energy is gaining prominence and is being used by some sectors in their solar powered projected.

Housing

Kakamega County has semi-permanent houses in rural areas with a few permanent houses. Households in urban areas have permanent houses with few houses in informal settlement being semi-permanent and temporary. The temporary houses are made of mud and cow dung in walling while roofing is done using grass and iron sheets. Permanent houses are constructed using bricks and iron sheets.

Water supply and Sanitation

The county relies on both surface and ground water sources for its supply. It has the following main sources of water exclusive of the boreholes and springs, Rivers: Yala,

Isiukhu, Nzoia, Firatsi, Sasala, Lusumu and Kipkaren. These form the major sources of water for domestic use and irrigation.The quality of water in the county is good for domestic use however, the land use practices including increase in use of chemicals in agriculture sector as well as waste water by industries tend to pollute the water as it flows downstream. Additionally our water sources are not used sustainably due to the dilapidated infrastructure of the distribution system, inadequate storage, illegal water connections, wasteful water use and vandalism of the infrastructure leading to approximately 53% water losses.

The main water service provider in the county is Kakamega County Water and Sewerage Company Limited (KACWASCO), which is a County Corporation. The Company supplies water to Kakamega Town, Mumias, Navakholo, Butere, Malava and Lumakanda. Currently the water company supplies approximately 78% of the consumers mainly in the peri-urban and small towns of the county.

The rural areas are mainly supplied by community water projects, NGO's, private sector actors as well as self-supply through hand dug wells and so on. The rural water sub-sector is marred by low un-functionality rates due to poor management of the water supply projects and schemes, inefficient technologies and weak governance. As per LVNWSB Reports in 2016, rural water coverage in the county is at 30%.

World Health Organization (WHO) classifies the population using safe water sources are those using; piped water (into dwelling, compound, yard or plot, to neighbor, public tap/standpipe), tube well/borehole, protected well, protected spring, and rainwater collection. Bottled water is considered as safe water source only if the household is using an improved water source for handwashing and cooking.

According to Kakamega County MICS 2013/14 survey report, improved water sources for the population vary strongly by location (Urban/Rural) and by type of water source. In urban areas, 58% of the population use drinking water that is from a public tap/standpipe, 16 % use piped water into their dwelling or into their yard or plot while 7 % use water from a tube-well/borehole. In rural areas, most commonly used sources of improved water are protected wells/springs (61 %) and tube-well/borehole (6 %).

In general, most common sources of water in the county are Protected Springs (43.3%), Protected Wells (16.3%), and Piped Water schemes (12.4%), Surface Water (10.8%), Unprotected Springs (5.5%), Unprotected Wells (4.1%), Rain Water (1.3%) and Tanker Truck (0.3%). Figure 5 shows the percentage of county residents using different sources of water.

Findings from a study conducted in Kakamega County by KNBS in conjunction with UNICEF (MICS) in 2013/2014 indicate that 65% of the population are living in households using improved sanitation facilities. This proportion represents 68% in urban areas (46% use improved pit latrines with slabs while 31% use pit latrines without slab/open pit) and 63% in rural areas (55% use pit latrines with slabs while 37% use unimproved pit latrines without slab/open pit). Other improved sanitation facilities such as flush/pour flush facilities (12%)

and ventilated improved pit latrine (9%) are less commonly used. The study further points out that about 1% of the population have no toilet facilities and practice open defecation.

The data indicates use of sanitation facilities as Piped Sewer (4%), Septic Tank (1.9%), Ventilated Improved Pit Latrine (7.9%), Pit latrine with Slab (51.2%), Pit Latrine without Slab/Open Pit (34.0%) and Open Defecation (1%).

Health Access and Nutrition

Kakamega County does not have a referral hospital. It has one County General Hospital, nine (9) sub-county hospitals, nine (9) mission/NGO hospitals, one (1) private hospital, eight (8) nursing homes and twenty seven (27) public health centres. Furthermore, the county has one private health centre, sixty six (66) public dispensaries, thirty one (31) private dispensaries and one hundred and seven (107) private clinics.

The total bed capacity in the county for all the public and private facilities is 3,949 with the public sector having 2,338 beds while the private hospitals have 197 beds. The bed capacity in the mission/NGO health facilities is 1,414.

The doctor population ratio stands at 1:34,916 while the nurse patient ratio is 1:2,658. In terms of distance to the nearest health facility, it takes 51.1 per cent of the population about 5km to the nearest health centre while 32.2 per cent take between 1.1 and 4.9 km to the nearest facility. Further, 16.7 per cent of the population however travel a distance of less than one kilometre.

The nutrition status in the county is wanting with 8.6 per cent of the under five children being underweight. The total number of children under 5 years mainly from poor households who are severely or moderately undernourished is 77,444.

4.7 Busia County

4.7.1 Location and Size

Busia County is situated in western Kenya and serves as the gateway to Kenya's regional neighbors 0 Uganda, Rwanda, Burundi, DRC Congo and Southern Sudan, with two border crossing points at Busia and Malaba Towns.

Busia County Government has its headquarters in Busia Town. The County covers an area of 1,694.5 square kilometres (km2). The County is situated at the extreme Western region of Kenya and borders Bungoma to the North, Kakamega to the East and Siaya to the South East, Lake Victoria to the South West and the Republic of Uganda to the West. It lies between latitude 0° and 0° 45 North and longitude 34° 25 East. The County can be accessed through Kisumu International Airport which is 112 Km away.

Busia County is predominantly inhabited by the Luhya and Teso speaking people. Other inhabitants include the Luo, Kikuyu, Somali and Kisii. Most of the residents of Busia County are Christians, although there is a significant population of Muslims in the urban centres.

4.7.2 Population

The county's population was reported to be 893,681 in accordance with the 2019, Kenya Population and Housing Census with 426,252 males, 467,401 females and 28 being intersex.

4.7.3 Physical, Topographic Features, climate & hydrology

Most parts of Busia County fall within the Lake Victoria Basin. The altitude is undulating and rises from about 1,130 metres (m) above sea level at the shores of Lake Victoria to a maximum of about 1,500 metres (m) in the Samia and North Teso Hills. The central part of the county, especially Butula and Nambale Sub - Counties, are occupied by a peneplain marked by low flat divides of approximately uniform height, often capped by lateritic and a shallowly incised swampy drainage system.

The Samia Hills represent the basement complex and consist of acid and sub0acid lavas, tuffs, and agglomerates, banded quartzite and iron stones. The Kavirondo series rocks are developed around Busia, Nambale and Butula while the granites dominate the Northern parts of the county. The Northern part of the central region features granitic outcrops, which are essentially part of the peneplain and is characterized by the presence of large granitic hills and tors such as Amukura and Chelelemuk. The Southern part is covered by a range of hills comprising the Samia and Funyula Hills which run from the North East to the South West culminating at Port Victoria, forming a very conspicuous topographic feature.

The Southernmost part of the county is covered by the Yala Swamp which is a down warped area associated with the formation of Lake Victoria. The area forms a colony of papyrus growth and is broken by irregular water channels and occasional small dams with grassy islands. This area is covered with lacustrine and alluvial deposits of recent and Pleistocene times.

The county is also served by Rivers Malakisi to the extreme North, Malaba in the Northern entry of the Central Region and River Sio in Funyula and Nambale Sub - Counties. River Nzoia drains into Lake Victoria through Budalang'i Sub-county.

Busia County receives annual rainfall of between 760 millimeters (mm) and 2000 mm. 50% of the rainfall falls in the long rain season which is at its peak between late March and late May, while 25% falls during the short rains between August and October. The dry season with scattered rains falls from December to February.

The temperatures for the whole county are more or less homogeneous. The annual mean maximum temperatures range between 26°Celcius and 30°Celcius while the mean minimum temperature range between 14°Celcius and 22 °Celsius.

4.7.4 Ecological Conditions

Whereas most parts of Busia County have sandy loam soils, dark clay soils cover the Northern and Central parts of the county. Other soil types are sandy clays and clays.

To the extreme Northern part of the county, the land formation and structure makes it suitable for both food and cash crops farming like tobacco and cotton. The lower Northern part covering parts of Nambale, Butula and Amukura in Teso South are suitable for maize, robusta coffee and sugar cane cultivation.

The Central and Southern parts of the county are suitable for maize, cotton and horticultural crops. The lower parts of Samia and Bunyala Sub - Counties require irrigation while large areas of Bunyala Sub - County towards the lower reaches of Rivers Nzoia and Yala require drainage.

4.7.5 Land and Land Use

The major land use in the county is for crop production and livestock farming. Other land uses include brick making, urban settlements, sand harvesting and quarrying. The sandy soil near the lake shores, beaches and sand from the rivers are harvested for use in construction. With the increasing population in the county, the land currently being used for forestry and agriculture is being converted into human settlement. It is expected that as the demand for food and shelter increases the land under forestry will be under more pressure. This is resulting into deforestation and destruction of water catchment thus drying up of streams leading to water shortages.

4.7.6 Economic sectors

Agriculture, fishing and trade are the main economic activities in Busia County. Being the entry points between Kenya and Uganda, Busia and Malaba Towns are thriving trade towns where livestock, agricultural products and manufactured goods are traded.

Busia County's climate is conducive for agriculture. Some of the crops that are grown within the county in small scale include maize, beans, sweet potatoes, millet, cassava, cotton, tobacco and sugar cane. Fishing is a major economic activity in Busia with Lake Victoria being the main source of both Nile Perch and Tilapia.

The on-going mining activities in Busia County include sand harvesting (commonly along riverbanks), brick making, quarrying and ballast mining in the hills covered by granites.

Busia County is endowed with beautiful natural features that include the Lake Victoria, Africa's biggest and the world's second largest fresh water lake and large Nzoia and Yala swam. Strategic location with direct access to the great lakes that make the county attractive for investment targeting regional markets such as Uganda, Rwanda, Democratic Republic of Congo and Southern Sudan.

Busia, through the Busia and Malaba transit points is a significant contributor to the National Exchequer.

In addition, the county has over 80 trading centres with two designated towns and some of the main urban centres and markets include: Busia, Malaba, Nambale, Bumala, Samia, Amagoro, Sio-Port, Port Victoria, Butula and Ang'urai among others. Most of the markets in

the county are open air markets which require planning and the main activity is sale of agricultural produce and second hand clothes.

There are no industrial parks in Busia. However, the county has Jua Kali sheds found in Busia, Moding and Nambale.

The County has two major factories: Busia Sugar Factory at Busibwabo and West Kenya Sugar Factory at Olepito. Other industries found in the County include: Flour Mills- Deluxe; Fish Filleting – Port Victoria.

There are also several non-functional cotton ginneries at Nambale, Amukura and Mulwanda. There are plans to revive cotton ginneries. A fish cooling plant at Marenga in Bunyala is awaiting commissioning, while a cassava factory at Simba Chai in Teso South Sub - County is almost complete.

In Busia, blue economy activities are found around the Lake Victoria mostly involving aquaculture, fishing activities, marine transport and tourism.

4.7.7 Infrastructure Development

Road, Rail Network, Ports, Airstrips and Technical Training Institutes

The total road network in the county is approximately 1,600 kilometres (km). This consists of 169.64 km of tarmacked roads, 591.91 km are of gravel surface and 838.55 km earth surface. Some of the roads are however impassable during rainy seasons because they lack appropriate drainage.

Class A roads in the County include part of Busia0Kisumu and Malaba0Mombasa while Class B roads include Busia-Mumias, Busia-Malaba-Malakisi. Class C roads include Ruambwa-Nangina-Bumala, Machakusi-Amukura-Butula, Class D roads include Nambale-Shibale, Adungosi-Segero, and Sisenye-Sio port.

The County is traversed by only 11 km of railway and served by one railway station in Malaba Town crossing into the Republic of Uganda. The Government of Kenya has identified two corridors for the development of modern, high capacity Standard Gauge Railway (SGR) transport system for both freight and passengers. Phase 1 (472km) covering Mombasa to Nairobi was completed and Phase 2 (490km) covering Nairobi to Kisumu to Malaba in Busia County is underway. The County has no functional airport or airstrip and has two ports at the Lake Victoria shores. The Sio Port in Samia Sub - County and Port Victoria in Bunyala Sub - County which mainly serve as fish landing ports.

Information Communication and Technology

Busia County has a total of 23 post offices and over ten licensed private couriers among them G4S, Wells Fargo and a number of public service vehicles couriers such as Modern Coast, Easy Coach, Transline, and Crown Bus. Busia and Malaba Towns are now covered by fibre optic network. The county is mostly covered by cellular phone network provided by Safaricom, Airtel and Telkom. There are over seventy licensed cyber cafes most of which are located in urban centres.

Energy Access

The main source of energy is firewood with 95% of the households of rural population relying on it for cooking and heating. About 60% of the population in rural areas rely on kerosene as the main source of lighting. Only 49% of the county residents have access to main grid electricity. The county has not made sufficient attempts at exploiting the available renewable energy resources.

Housing

Housing is a basic human right. In the Constitution of Kenya, Article 43 (1) (b) requires that every Kenyan should have access to quality housing with proper sanitation. Overall, Busia County may be characterized as having poor housing. Housing types in Busia County is categorized in terms of the building materials used.

Water and Sanitation

The benefits of having access to improved drinking water source can only be fully realized when there is also access to improved sanitation and adherence to good hygiene practices. Indeed, access to safe water and sanitation are human rights, as recognized in 2010 by United Nation General Assembly (UNGA).

Investments in water supply have improved the lives and help reduce poverty. Lake Victoria offers a source for irrigation to small scale farmers and its home for fish, a major economic activity for the residents.

There are two main existing water supply schemes in Busia County. The Sio River Water Supply that serves Busia Town and its environs and the Bunyala Supply Scheme that serves Port Victoria Town. The National Government has recently launched two more schemes in the county. Kocholia Irrigation Scheme on River Malakisi, which aims to supply water to 10,000 people and Ang'ololo Scheme on River Malaba that will serve residents of Kenya and part of Uganda.

Accessibility of water by citizens in the county currently stands at 42% of which 81.6% is improved water sources. The main water sources in Busia are surface water, ground water, and run0off water. There are three main rivers in the county namely; Malakisi, Nzoia and Sio. Other sources include protected springs, dug well or rural piped schemes. Lake Victoria is an important resource for the people of Busia.

The main source of drinking water in Busia County is borehole (46%) while other sources include: rivers (19.1%), springs (22.3%) and piped water (12.5%). Most of the water is not clean, therefore most people treat their water with chlorination being the most preferred method. Other methods for treating water includes boiling and decanting.

Households with latrines account for 34.3% of the population. The sanitation facilities used include pit latrines which account for 25.8%, uncovered pit latrines (13.5%), covered pit latrines (12.3%), VIP (6.5%) and 0.2% flush toilets. Waste/garbage disposal is done by public garbage and heap burning which accounts for 19.7%, garbage pit (12.1%), farm garden (8.9%), public garbage heap (1.9%) and 0.4% disposed by local method. Busia has

been declared an open defecation free county. Sanitation is a constitutional right in Kenya, the responsibility for which rests on the shoulders of the County Government.

Health Access and Sanitation

There are 81 health facilities in the County. In Busia County, 31% of the children below five years are malnourished while 26.5% are stunted. There have been concerted efforts to improve the situation by both the Government and NGOs including provision of food supplements and promoting income generating activities to vulnerable groups. National Government policy objective is to achieve good nutrition for optimal health of all Kenyans. Enhancing food access, provision special nutrition interventions for specific vulnerable groups and creating awareness to provision of nutritious food to all family members and especially children are among other major Government objectives.

5 ANALYSIS OF ALTERNATIVES

This section analyses the project alternatives in terms of site, technology scale and waste management options.

The analysis of alternatives in Environmental Impacts Assessments shall consider other practicable strategies that will promote the elimination of negative environmental impacts which have been identified. This section is a requirement of the National Environmental Management Authority, and it is critical in consideration of the total development with minimal environmental disturbance.

This report has identified the major environmental impacts during the scoping and screening exercise. The proponent and Environmentalist worked together, utilizing findings of these impacts to analyze possible options for the final development.

The following alternatives have been identified and have been discussed with the proponent with a view of reducing environmental effects: These are considered as:

- Alternative 1: Repair & Upgrade of the existing railway line only
- The "No-Action" Alternative
- Development of an Alternative route

5.1. Alternative 1: Repair & Upgrade of the existing railway line and renovation of station buildings only

- Replacement of all rails and sleepers;
- Re-conditioning of the ballast layer and replacement / addition of ballast as necessary;
- Repair of the formation level, where necessary;
- Track geometry correction;
- Repair and replacement of manually operated switches with Self normalising switches/ points;
- Repair and maintenance of existing drainage culverts, and addition new culverts if required;
- Repair and strengthening of structural steel bridges,
- Grade of railway conditions to allow for maximum acceptable speed
- Renovation of station buildings
- Fencing of the stations

It is envisaged that works will entail completely replacing a sections of the rails and sleepers. The work will involve removing the existing worn-out rails and sleepers, and then lifting, cleaning and re-setting the ballast layer. New ballast will be added. The formation layer (under the ballast layer) will also be repaired and re-compacted where necessary.

This report has identified social, physical and economic impacts for this proposal. This project will have minimal impacts on the physical environment and has considered the necessary measures to almost eliminate the identified issues of interference with traffic, noise, solid and sewerage management and disposal. Secondly, most of the structures

to be rehabilitated are in existence and thus are best suited for the proposal, at the same time the rehabilitation and revamping project will cost the government less as compared to initiating a new project.

As proposed, however, the environmental experts have identified mitigation measures for traffic congestion, solid and liquid waste management. The experts therefore propose that the KR to provide road signs to direct traffic and ample parking slots will be provided on various sites. The proposed ESMP in the report could efficiently manage the impacts identified for this project.

5.2. No Action Alternative

The no-action alternative on the physical environment, should not generate any potential impacts on flora and fauna identified in the study area, this is however not a guarantee. If the area is not developed, damage and interference with flora and fauna may still occur in its present state.

In terms of the social and economic environment, the "no-action" alternative would eliminate the spillover benefits and associated benefits related to the project and explicitly discussed in various chapters in this ESIA report.

The No- Action Project Option is the least preferred from the socio-economic and partly environmental perspective due to the following factors:

- The economic status of the Kenyans and the local people of Western region will remain unchanged.
- Increased emissions due to increased trucks transporting goods
- The price of goods will still remain high
- The local skills would remain underutilized.
- Lack of business opportunities in Western Region.
- Reduced interaction both at local, county, national and international levels.
- No employment opportunities will be created for Kenyans who will work in the proposed project area during and after rehabilitation of the facilities.
- Increased urban poverty and crime in the region in particular

From the analysis above, it becomes apparent that the No Project alternative is no alternative to the local people, Kenyans, and the government of Kenya.

5.3. Development of an Alternative route

There is no alternative site that has been identified by the proponent, but cost implications will much higher considering that the proponent would have to conduct land acquisition for the new.

Unlike Alternative 1, Alternative 3 would result in significant environmental and social impacts for any one of the major re-alignments/ re-routing of the railway line. Furthermore, the cost of any one of the major re-alignments would be very expensive

without any significant reduction in travel time resulting.

5.4. Overview of Alternative Analysis

Based on the above, the most environmentally sound alternative is that the project should be done in the described location. The proposal will put in place good practices for managing solid and liquid waste water and other related impacts.

Therefore **Alternative 1** was the recommended alternative for the reasons stated above since all work is to occur with the existing servitude boundaries, and only existing roads and the existing infrastructure will be utilized for the transport of construction machinery and materials.

6 PROJECT ACTIVITIES

6.1. Description of the project cycle

A project cycle involves several stages, which include construction, operational and decommissioning phases. This proposal will be completed in one single phase and the activities associated are described below.

6.2 Project Activities

6.2.2. Pre-construction/ rehabilitation Investigations

The implementation of the project's design and construction phase will start with thorough investigation of the site's biological and physical resources in order to minimize any unforeseen adverse impacts during the project cycle. Environmental monitoring was done for ease of monitoring the project in future.

6.2.3. Sourcing and Transportation of Materials

Building and construction materials will be transported to the project site from their extraction, manufacture, or storage sites using transport trucks. The materials to be used in construction of the new railway line extension project will be sourced from local and neighbouring areas. Greater emphasis will be laid on procurement of materials from within the local area, which will make both economic and environmental sense as it will reduce negative impacts of transportation of the materials to the project site through reduced distance of travel by the materials transport vehicles.

6.3 Construction/ Rehabilitation Phase

The following activities will be undertaken during the construction phase:

- Demolition and relocation of existing structures encroaching on the existing railway line
- Clearance of vegetation
- Excavation and Foundation works
- Ballasting, track packing, geometry correction,
- Construction of drainages and reinforcement of embankments
- Storage of materials
- Transportation and disposal of building and demolition materials
- Extraction of raw materials and consumption
- Removal of Asbestos Containing Material Roofing at various railway stations

- Repairing and repainting of the viaduct structure/Bridge

6.4 Operational phase

- Procurement of supplies, fuel, furniture and maintenance fittings etc
- Transport of Goods
- Solid and liquid waste and storm water management activities

6.5 Decommissioning Phase

The activities associated with this phase include; demolition, dismantling of the project equipment, and clearance of demolition materials and disposal in a proper manner. The redevelopment/rehabilitation of the site will merely depend on the trend of development of the area and the prevailing planning standards at that time.

6.6 Health and Safety Practices

The engineers working on site shall be committed to Health and safety practices by:

- Implementing health and safety systems.

6.6.2. Personal Protective Equipment

The staff on the construction site will be provided with appropriate safety gear:

- Safety boots
- Safeties goggles and face shields for use during welding
- Helmets
- Overalls
- Safety Harnesses (for heights)
- Ear muffs
- Dust masks

6.6.3. Employee Facilities

The following facilities will be provided for the staff

- Portable Toilet facilities
- Clean and Safe drinking Water
- First aid kit
- Standby vehicle on site for 24/7 to handle emergencies

6.7 Resource Use

The Engineers will ensure that water and electricity are conserved. Staff will be sensitized on the need to conserve the scarce resources. There will be close supervision of activities and misuse will be discouraged.

6.8 Security

Security will be provided 24 hours. Movement in and out of the facility will also be controlled. This is in order that the people who are working at the construction site are not a security risk and that they do not destabilize the surrounding social structure.

6.9 Safety of the new railway line

Precautions will be taken to ensure the safety of the new line is defined. It is recommended that:

In order to meet the desired track parameters and to bring down the cost of constructing the railway line, a survey was undertaken to develop a design to guide the engineers. This was carried out with the consultation of the following stake holders whose assets and equipment were erected within the road reserve identified to construct the line:

- Kenya Power- To relocate Power line close to the railway line

6.10 Operation Phase

6.10.2. Shared responsibility

In order that environmental performance is maintained, the top management will implement a shared responsibility with the staff and clients. The communication channels shall be through notices on notice board and newsletters. The shared responsibility program shall aim at making continuous improvement as well as carrying out preventive maintenance of the facility on time.

6.10.3. Resource Use

Efficient use of resources is important. Efficient resource use is normally not keenly observed by a larger section of the staff. The management will ensure that each staff member is well sensitized on the need to use resources efficiently. Use of natural light and efficient use of water will be encouraged. Cleaner production principles shall be encouraged; the property engineers will ensure that the facilities are in good working conditions and report any need for repairs and have leaking pipes repaired.

6.10.4. Waste Management

Waste during this phase shall be mainly domestic waste. KR to contract NEMA registered waste handlers to collect and dispose solid waste as per the EMCA waste regulations.

6.10.5. Risk Assessment

Environmental Health and safety risk assessment shall be done before commencement of works and all staff shall be sensitized on the risks present.

6.10.6. Security

A perimeter fence shall be constructed for security purposes all-round the railway premises. There will also be contracted security firm and Kenya Police officers that will guard the premises during the operation phase. The main exit and entry gates will be manned and there will be controlled access through the main gate into and out of the property.

6.10.7. Maintenance

Maintenance of railway line shall be done in an environmentally friendly way. There will be periodic mechanical and electrical inspections of the vessels to reduce electrical risks.

6.10.8. Decommissioning

The proponent shall be committed to doing all that is possible to maintain the properties in order that their life span is maximized. When maintenance will become uneconomical, the option of decommissioning, dismantling and demolishing will be the last resort. Other options that will be looked at will be change of user from apartments to either office block, a commercial or to another a use that can generate more income. e.g. hotel, entertainment when the need arises. If demolition is to be done then appropriate safety precautions shall be taken. Disposal of demolished material shall also be disposed off in an acceptable manner as per the solid waste management act, 2006.

7. MATERIAL TO BE USED

7.1. Land

The predominate material that is necessary for the implementation of this project is land and the vessels. Without them the project cannot be implemented.

7.2. Railway Line Rehabilitation Materials

The engineer will ensure that most of the materials are locally sourced except for the vessels fittings which may be imported.
Materials that will be used to construct the new line will include the following:

- Cement
- Concrete
- Sand
- Wood
- Steel sleepers and rails
- Water
- Grass and soil for landscaping
- Ballast
- Paint for signage's and station buildings

7.3. Construction Equipment

Concrete mixers, vibrators, plumbing equipment, electrical equipment, lorries for the transportation of materials.

7.4. Project Inputs

The project inputs will comprise of the following:

- Land- will be needed for the development of the project.
- Water- The construction site clearing activities require water for mixing the cement, watering excavated areas, for landscaping among others.
- Plant and equipment – These will be required during the construction of the railway line, fencing and associated works.
- Labour (skilled and unskilled) – causal workers will be employed as well as qualified personnel e.g. engineer, surveyor, and, contractor.
- Capital – the proponent will require finances to implement the project.
- Construction materials and equipment are necessary.

- Policy and enforcement instruments that are needed in terms of approvals and the relevant legislations to the project.

Table 3: Management of Waste

Project phase	Materials to be used	Waste generated	Proposed disposal method
Transportation of raw materials and maintenance equipment	Trucks Fuel Spare parts and lubricant oil	Air fumes Used oil Scrap metal	Reuse oil on movement parts of machines e.g. lawn mower, wheel barrows. Maintain fleet of trucks to minimize air fumes
Limited Excavation	Excavating machines	Excavated Soils and vegetation	Landscaping and refilling
Building works	Machine cut stones Steel, cement, Timber/wood Glass Asbestos Roofing Sheets	Construction debris Used timber Broken glasses ACMs	Refilling Reuse during operation of camp Make decorations for reception area Proponent to engage a NEMA registered asbestos handler to dispose off efficiently and responsibly to a NEMA registered landfill site as per the guidelines
Electrical & mechanical installation	Electrical gadgets, pipes switches, wire	Unusable parts	Proponent to dispose off efficiently responsibly off Site
Maintenance of railway line and equipment	Oil & lubricants Equipment Spare parts Used paint	Used oil Scrap and used paint	Reuse/recycle or construction a grease trap. Reuse/recycle or enlist a disposal agent Reuse
Cleaning and housekeeping	Water Biodegradable detergents	Waste water	Installation of sewerage bio digesters where sewerage facilities are not available

Waste minimization and reduction programmes will be documented and instituted. Waste should be segregated before disposal. A strategic solid management should be established for the proposed development. All waste should be segregated into three categories at all points of origin as such:

a. Category i comprising of organic wastes from the offices. This waste will be collected, composted and used for flower gardens.
b. Category ii recycle waste such as glass, bottles, metal and plastics. These will be disposed off by a registered waste disposal agent who will dispose of to recycling centers.
c. Non-recyclable inorganic wastes will be segregated and collected and disposed off to the nearest refuse recycler in the respective county town or other location approved by the local authority.
d. Effluent will be channeled to the septic tank and bio digesters or shall be collected by a registered waste disposal agent who will dispose off appropriately.

8. PRODUCT, BY-PRODUCTS AND WASTE TO BE GENERATED BY THE PRODUCT

8.1. Introduction

During construction/ rehabilitation phase the potential negative impacts from this proposal will be air pollution (land, air, and water), noise, loss of vegetation, insecurity, increased demand for water, traffic congestion, occupational hazards and fire risks, employment generation and water quality. During operation, the impacts will be increased demand for water, increased traffic flow, provision of houses, effluent and solid waste generation will be realized.

8.1.1. Construction Phase

The rehabilitation of Longonot -Malaba railway line will generate the following impacts/products:

- Dust emissions arising from excavation, decommissioning activities on site and transportation of construction materials to site.
- Noise generation from excavation activities, construction equipment and machinery operations.
- Increased water demand from construction activities.
- Increased opportunities for employment arising from the demand for work from the proposed project.
- Waste generated from construction/ rehabilitation activities.
- ACMs.

8.1.2. Design and Operation Phase

During this phase the following will be generated:

- Increased generation of sewerage and domestic waste from the operation of trains
- Provision of transport solutions.
- Improved urban environment and infrastructural facilities.
- Increased traffic flow within the area due to increased densities from the project.

8.1.3. Waste and Disposal Methods and Management

8.1.3.1. Construction Phase

a) Construction waste

Excavation activities will generate excavated soil and demolition waste. This type of construction waste will include left overs of mortar, concrete, broken stone, stone chippings, ballast, cement, sand and concrete chippings. The engineers shall ensure that proper disposal methods are used. Excavated soil will be used for land filling and

landscaping or ferried away to another site if all is not used up in preparation of beds for hard surfaces, drainage channels, paved and car park areas.

Waste minimization, recycle, reuse and reduction principles shall be applied in the waste management strategy that shall be instituted.

b) Other construction wastes

These are materials that will be used to construct the railway line, which will generate different types of waste such as: pieces of reinforced steel, timber, broken glass, timber, packaging materials, oils, paints, asbestos lining and plastics. Segregation and sorting of this waste to identify some for re-use or re-cycling shall be done. Private waste collectors will be contracted to clear unusable waste e.g. Asbestos.

Finally, waste prevention will be encouraged to reduce both the quantity and volume of waste during the construction phase. This can be achieved by using smaller amounts of resources to provide the same product (e.g. introduce re-use or re-fill, resource-oriented purchasing) and using less resource-dependent construction principles and materials. The contractor will encourage product re-use which involves the use of a product in its original form, for its original purpose, with or without reconditioning.

c) Domestic waste and waste water

There are other wastes which will be generated by non-construction/ renovation activities because of the presence of the staff at the site. These shall include the following waste water, food debris and effluent. The filtered water will be directed to the storm drain system. Food waste and debris is biodegradable, which will be segregated and collected. Some of the waste will used for manure in the gardens while some will be put in a compost pit which will be filled up during landscaping and clearing of the site.

8.1.3.2. Operation Phase

Waste during this phase shall be mainly domestic waste. Private waste collectors shall be involved in collection of liquid and solid waste from the respective railway stations.

8.1.3.3. Decommissioning Phase

The proponent shall be committed to doing all that is possible to maintain the property in order that its life span is maximized. When maintenance will become uneconomical, the option of decommissioning and demolishing will be the last resort. If demolition is to be done then appropriate safety precautions shall be taken. Disposal of demolished material shall also be disposed off in an acceptable manner.

The decommissioning phase will generate the following impacts/products:

- Dust emissions arising from demolishing, decommissioning activities on site and transportation of demolished materials from the site.
- Noise generation from demolishing activities, demolishing equipment and machinery operations (Compressors and bulldozers).
- Increased insecurity in the area due to idling of casual workers.

- Increased opportunities for employment arising from the demand for work from the decommissioning activities.
- Waste generated from demolition and dismantling activities.

9. PUBLIC CONSULTATION AND PARTICIPATION/ STAKEHOLDER ENGAGEMENT

9.1. Introduction

Public involvement in project development is enshrined in the Constitution of Kenya, 2010. The EMCA 1999 and IFC Performance Standards call for effective stakeholder participation and public in the EIA process, this case an ESIA study. Public participation basically entails involving, informing and consulting the public in planning, management and other decision-making activities. It tries to ensure that due consideration is given to public values, concerns and preferences when decisions are made, with the public actively sharing in the decisions that government and other agencies make in their search for solutions to issues of public interest.

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

It has also demonstrated successfully that projects that go through this process will acquire high level of acceptance and accrue benefits to a wider section of the society.

Public consultation during this EIA study was carried out with the following aims:

- ✓ Introduce and inform the stakeholders and any interested parties of details of the proposed project
- ✓ To seek views, concerns and opinions of people in the area concerning activities of the proposed project
- ✓ To establish whether the community members are subject to potential positive or negative environmental and social effects from operations of the proposed project and
- ✓ Seek proposals from public on mitigation measures
- ✓ Build stakeholder consensus and acceptance of the proposed project
- ✓ Improving public confidence in the ESIA process

Public consultations were conducted on 23rd August 2021 to 1st September 2021 through the use of questionnaires which were administered randomly along the project line.

9.2. Methodology

Public participation and consultation was achieved/ undertaken in the following steps:

(i) Stakeholder identification and analysis to establish the level and mode of engagement per stakeholder group

(ii) Stakeholder engagement through the use of appropriate tools and methods

- ✓ Personal interviews with the local community members and the local administration.
- ✓ Administration of questionnaires to a sample population drawn from the project neighbours, various government stakeholders and truck drivers.
- ✓ Community Meetings (Barazas) were held with community members along the project area. The community Baraza meetings targeted the representatives from local residents, leaders, church leaders, learning institutions, business community and local administration from locations within the project area. These meetings were held in the following areas:

Table 4: Stakeholder Engagement Meeting venue and dates

No	Area/ Location	Venue	Date	Time
1.	Longonot	Chiefs Camp office	24/08/2021	10:00hrs
2.	Gilgil	Gilgil Railway Station	25/08/2021	09:00hrs
3	Nakuru	Nakuru Locoshed	27/08/2021	11:00hrs
4	Eldoret	Eldoret Railway Station	29/08/2021	14:00Hrs
5	Bungoma	Bungoma Railway Station	31/08/2021	14:00hrs
6	Malaba	Malaba Railway Station	01/09/2021	09:00hrs

In all the meetings, there was a brief of the project given by the ESIA experts to aid in the understanding of the scope of the project and enable community members to raise their concerns and comments. Those with concerns commented and contributed issues of concern in-person and the ESIA experts and KR Staff were able to respond to the issues raised. This was recorded and reflected back in the minutes to ensure accuracy. Minutes of all meetings and pictorial evidence are appended in this ESIA report.

The EIA experts also made a visit to the project sites, taking records of observations and photographs.

Plate 1: Public Consultation Meeting in Progress at Longonot Chief's Camp Office

Plate 2: Public Consultation Meeting in Progress at Gilgil Railway Station

Plate 3: Public Consultation Meeting in Progress at Nakuru Locoshed grounds

Plate 4: Public Consultation Meeting in Progress at Eldoret Railway Station Training Room

Plate 5: Public Consultation Meeting in Progress at Bungoma Railway Station

Plate 6: Public Consultation Meeting in Progress at Malaba Railway Station Board Room

Due to the prevailing COVID 19 situations in the country, stakeholders and public consultation forums were undertaken under strict conditions for this ESIA study, where only a maximum of 20 community representatives were allowed for the meetings. Where possible the Experts organizing for the meetings chose to hold the meetings in open air and members were sanitized upon arrival at the venue. All members who were present for the meetings had their face masks on during the meetings. Also the durations for the meetings were shortened to a maximum of one and a half hours or less. All the containment measures were strictly adhered to as per the MOH directives including adherence to social distance.

The following is a detailed discussion of public consultation methodology used by the team.

9.2.1. Direct Interviews

Direct interviews were carried out during the field visit where comments were sought through engaging individual respondents in discussions about:

- ✓ Their overall opinion of the proposed infrastructure rehabilitation project
- ✓ The anticipated impacts and possible mitigation measures

This engagement process also gave the respondents the opportunity to give insights and details about the issues raised. The individuals spoken to directly were picked randomly by the study team.

Plate 7: Community engagement at Kihoto market in Naivasha

Questionnaire Administration

Open-ended questionnaires were prepared and administered to the randomly picked representatives of the local community in the project site. The questionnaire administration adopted two approaches: (**i**) direct filling by individuals who could be able to read and write on their own and (**ii**) assisted filling for those selected members who were unable to read and write. A total of 152 questionnaires were administered to representatives from the affected communities. Copies of the filled questionnaires are attached in the annex 3.

9.3. Emerging Issues

The study team had developed a number of direct questions that were used in all the public consultations (including in the questionnaires). The questions sought to seek the following from the community:

- ✓ What are the general positive or negative impacts (social or environmental) were they anticipating from the proposed project?
- ✓ What mitigation measures would the Proponent take to eliminate the negative impacts?

- ✓ What other comments would they have for or against the proposed project?
- ✓ Whether they are in support of the project implementation

The proceeding sub-sections provide highlights of findings and responses from the community regarding the proposed project, especially as was captured in the questionnaires:

9.4.1. Anticipated Project Impacts

Positive Impacts Responses from EIA Questionnaires

Different potential positive benefits were cited by the respondents as represented below:

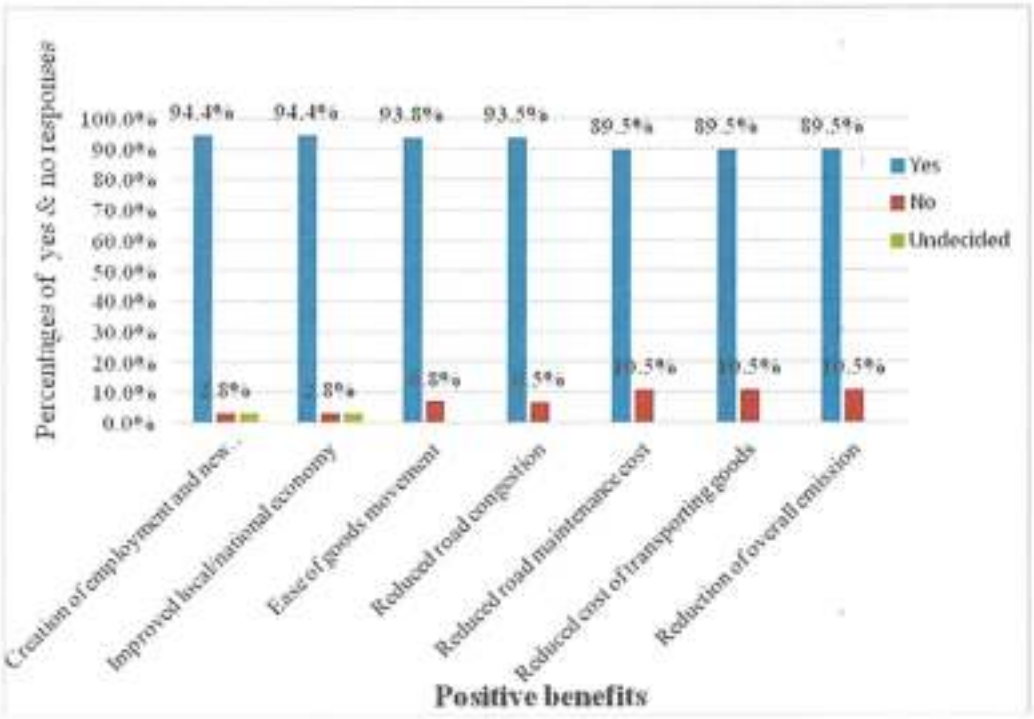

Figure 7: Possible project benefits identified by the community

In summary some of the positive impacts identified that were indicated on the analysed questionnaires as indicated in figure 7 above. Creation of employment and new market was ranked the highest (94.4%), Improved national economy (94.4%), ease of goods movement (93.8%), reduced road congestion (93.5%), reduced road maintenance cost with (89.5%), reduced cost of transporting goods (89.5%). In overall (89.5%) thought there would be a reduction of overall emission.

Negative Impacts

Some of the negative impacts identified were indicated on the analyzed questionnaires as indicated in figure 8 Increased noise was ranked the highest with (67.1%), followed by Possible resettlement/ displacement of business which was ranked the second with

(65.8%), Increased Dust (59.2%) increased waste (53,3%) increased traffic movement (50.0%) and Loss of livelihood with a (42.8%).

Different potential adverse impacts were cited by the respondents as represented in the next figure;-

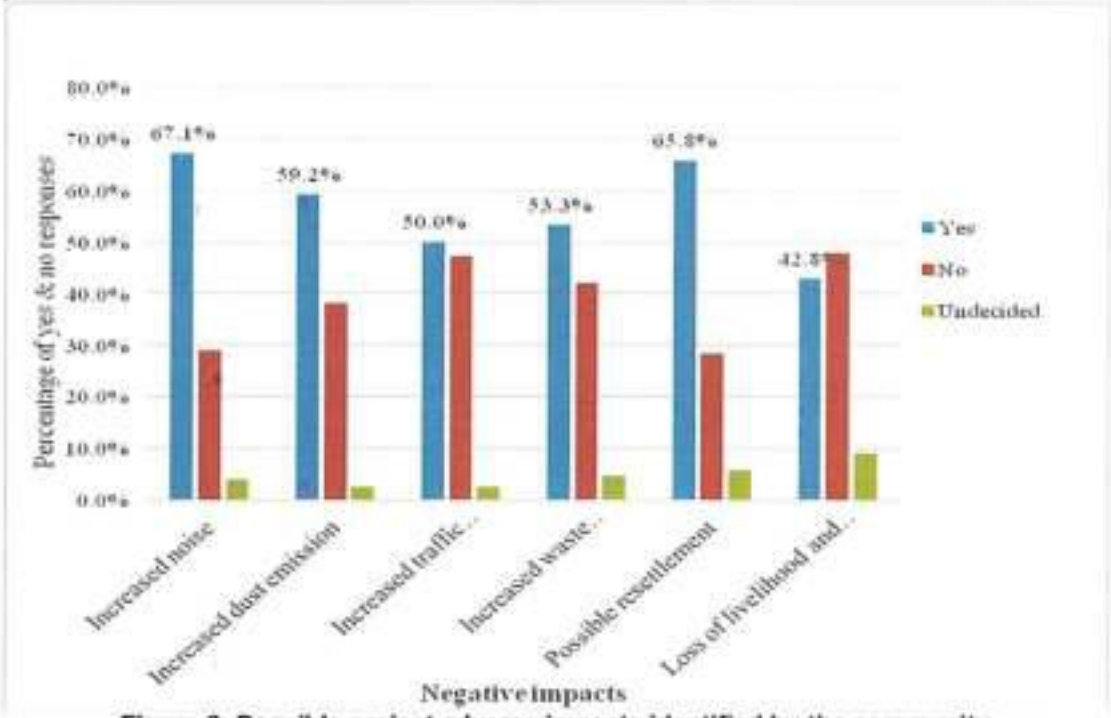

Figure 8: Possible project adverse impacts identified by the community

9.4.1. Project Implementation

For the different potential adverse impacts that were cited by the respondents, 100% of the sampled population supported the implementation of the project.

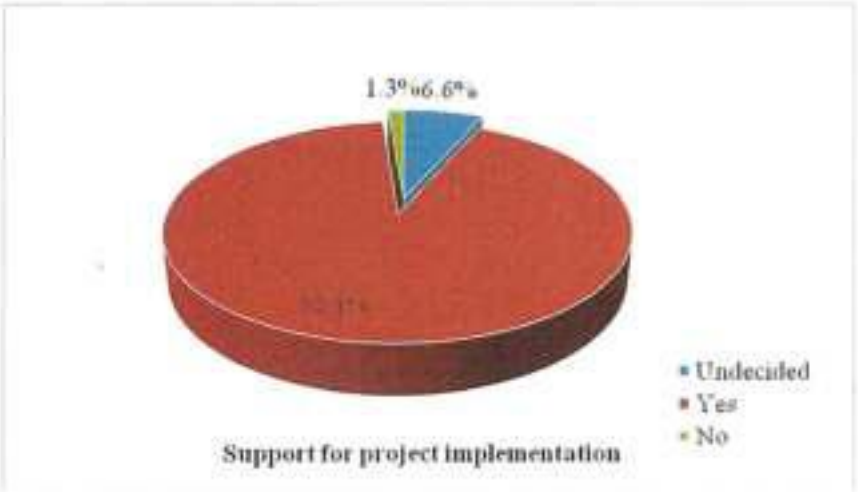

Figure 9: *Community in support for project implementation*

9.4.2. Gender Distribution

From the survey, 58% of the respondents were male and 42% were female who are normally considered to be a vulnerable group because they are faced with multiple tasks of being breadwinners, mothers, providers of shelter, and providers of security for those under their responsibility.

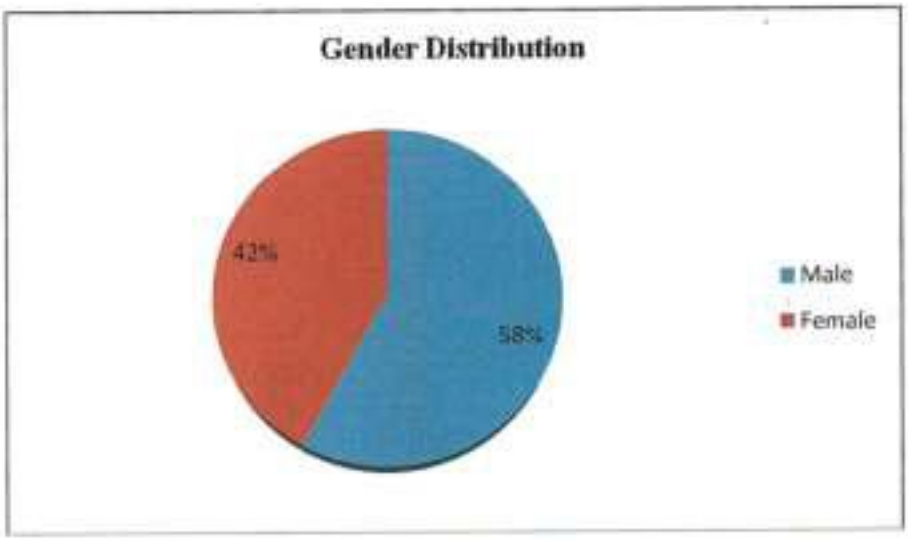

Figure 10: Gender Distribution

10. IMPACT IDENTIFICATION AND MITIGATION MEASURES

10.1. Introduction

The impacts of the project outlined in this document are either socio-economic or environmental impacts. This chapter outlines the potential negative and positive impacts that will be associated with the project. The first section of this chapter highlights the general impact of the project. The second segment gives impacts, related to the specific operation of the project. The impacts are related to activities carried out during construction/ rehabilitation, operation, maintenance and decommissioning phases of the projects.

10.2. Summary of Anticipated Project Impacts

Table 5: Potential issues associated with the rail upgrade

Potential Impact	Measures required to minimise impact
Transportation of materials	Selection of means of transportation which requires minimal disturbance or clearance of vegetation.
Access to track	Pre work site inspection,
	Identify side of formation to be used for access,
	Identify entrance and exit routes for transport and machinery (Access only available from Public Road crossings and some Occupational crossings)
	Identify & mark vegetation for clearance within Activity Zone.
Permanent and temporary Service Sites	Select, mark and carry out pre-work inspection of Service Sites and locate outside areas of native vegetation
Stockpiles and waste Management	Ensure that materials (sleepers new/ life-expired) remain within the Clear Zone or defined service sites at all times
	Assess contaminant levels of waste materials and dispose of, or recycle in accordance with NEMA requirements
Vegetation Clearance	Site inspection with environmentalist
	Marking of vegetation for removal,
	Flag species or areas of conservation significance
	Identify stockpile sites for mulch and timber
Fire management	Identify areas for clearance (long grass),
	Develop a fire management plan.
Erosion control	Implement necessary erosion and silt trap controls when undertaking rehabilitation works
Clean up	Identify and remove waste materials Obtain waste material deliver logs Post-work site inspection and sign-off.
Rehabilitation	Pre-work site inspection Identify sites within the work area suitable for rehabilitation Spread mulch from vegetation clearance to stabilise/ rehabilitate disturbed areas

10.2.1. Potential Positives Impacts (Implementation Phase)

10.2.1.1. Creation of employment opportunities

The rehabilitation/ construction phase of the railway infrastructure will create employment opportunities for semi-skilled and unskilled people, mostly local youths. More skilled employees will be recruited as mechanical engineers and support staff at the port and equipment operators. Others will be employed as truck drivers for the material transportation. Unskilled labour would be in form of site watchmen and supervisors.

10.2.1.2. Creating business and income opportunities to the locals

This is a potential positive impact, though it will be a minimum impact given the socio - economic and cultural setup of the project area. Ordinarily, the workers who would operate from the project site would depend on locally available goods and services, such as foodstuffs, transport services. These could be provided by locals. The security of the area will be improved as movement of the security agents will be enhanced.

10.2.1.3. Technology and skills transfer

The project will provide an opportunity for skills transfer and an opportunity for the unskilled personnel. The workers who will be employed in the different sub-projects will have an opportunity to learn about the various technologies that are used in the project. It is also possible that some members of the local community we able to see and interact with certain technology (tools, machines and equipment) for the first time in their lifetime. Through recruitment of labour locally, the workers will have an opportunity to learn an array of skills that relate to railway construction and maintenance.

10.2.1.4. Revenue generation and economic growth

Through the use of locally available materials during the construction phase for example cement, steel metals and others; the project will contribute towards growth of the country's economy by contributing to the gross domestic product. The consumption of these materials, oil, fuel and others will attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of these raw materials will be payable directly to the producers.

10.2.1.5. Optimal use of idle resources

The proposed rehabilitation of Longonot-Malaba MGR line is expected to put the idle resources into optimal use for the benefit of the local and national economy.

10.2.1.6. Provision of construction materials

The project will require supply of large quantities of construction materials most of which will be sourced locally within the project surrounding areas. This will provide ready market to the suppliers such as companies and individuals with such materials..

10.2.1.7. Landscaping

As the construction/ rehabilitation works progresses, the developer will also be carrying

out landscaping activities not only at the corridor but also on areas to be occupied by station offices. This will add aesthetic value especially in currently degraded areas.

10.2.2. Potential Positives Impacts (Operation Phase)

10.2.2.1. Creation of employment opportunities

The rehabilitation/ construction phase of the railway infrastructure will create employment opportunities for semi-skilled and unskilled people, mostly local youths. More skilled employees will be recruited as mechanical engineers and support staff at the port and equipment operators. Unskilled labour would be in form of security guards and supervisors.

10.2.2.2. Creating business and income opportunities to the locals

This is a potential positive impact, though it will be a minimum impact given the socio - economic and cultural setup of the project area. Ordinarily, the workers who would operate from the project site would depend on locally available goods and services, such as foodstuffs, transport services. These could be provided by locals.

Availability of transport means will attract traders, transporters, and other extension services e.g. education, health and other social services, which are essential for the population to develop and benefit from the increased economic activity. The security of the area will be improved as movement of the security agents will be enhanced. Further, professionals and other civil servants will be free to come and work in the area thus improving community integration.

10.2.2.3. Improved Transportation Efficiency

With the completion of this rehabilitation project efficiency and seamless transportation of goods between Longonot and Malaba will be achieved. Also transport will be eased, time of travelling will be reduced and the transport costs will reduce. These will boost economic development in the regions.

10.2.2.4. Revenue generation

The project is anticipated to generate revenue through rail transportation payment of relevant taxes and fees. The traffic volumes offered by the trains during the project operation will require locomotive and ship operators as well as maintenance services, which will be provided by personnel employed, paying relevant taxes. The consumption of oil and other fuel will also attract taxes including VAT which will be payable to the government hence increasing government revenue. The efficiency of railway operation will increase port efficiency, increase export and import volumes and improve foreign trade, tourism, agriculture, hence increase in the national economy.

10.2.2.5. Provision of a cheaper and faster means of transport

The respondents and participants at public meetings were positive that the proposed new railway line will provide a cheaper means of transport. This will be the best means of transport compared to road transport which is very expensive to the business community.

10.2.2.6. Ease of traffic and congestion along the Nairobi - Malaba Highway.

The participants also stated that the transport system will help to ease traffic and congestion caused by long distance trucks along the main Naivasha- Malaba Highway. After completion of the proposed rehabilitation of railway infrastructure, most of the cargo currently transported by road will be switched to transportation by rail. This will lead to elimination of significant amount of cargo trucks on the Highway therefore leading to ease of traffic and de-congestion.

10.2.2.7. Improved Road Safety/ Reduced Road Traffic Accidents

The public expects road safety from Nairobi- Malaba Highway to improve since most long-distance trucks will be removed. This will considerably improve the safety of public road users and reduce the number of road accidents along the busy highway in the long run. Reduced Road Accidents will be reduced due to decreased traffic flow on the Nairobi- Malaba Highway as freight trucks will be fewer on the roads. The fact that the railway corridor will be fenced and the railway line will be inaccessible from either side will lead to decrease in accidents since residents will have to utilize foot bridges. It is expected that the number of motor vehicles on the Nairobi- Malaba Highway will decrease as shippers take advantage of the more efficient railway line. As the railway corridor will be fenced off the number of wildlife and livestock deaths will also be drastically reduce. Similarly, fewer road accidents will occur as the road will be decongested.

10.2.2.8. Reduced Emissions

The public also expects a reduction on greenhouse gasses emission since most long-distance trucks will be removed. This will considerably reduce on the rate of global warming and climate change. Rail transport has significant low exhaust gas emissions compared to road transport hence reliable rail transport will attract high volumes of cargo translating to low traffic volume on the Nairobi- Malaba Highway. Therefore the number of vehicles will be reduced which will in turn reduce e gas emission levels.

10.2.2.9. Reduction of road maintenance costs

Due to the current inefficient railway network most industrial inputs and agricultural produce, Livestock and livestock products are transported by road. The completion of the new railway line and rehabilitation works will result to diversion of the road transportation to the railway line, which in turn will reduce the number of heavy trucks on the road resulting to a drastic reduction of the maintenance costs.

10.2.3. Potential Negative Impacts (Implementation Phase)

10.2.3.1. Noise, vibrations and disturbances

Excavation of the new railway line route and quarrying material sites are usually associated with some degree of noise and vibration. A typical excavation works usually generate a significant amount of disturbance in terms of vibrations and noise. Some incremental level of noise can be expected from increased traffic that will be

transporting construction materials from site to the railway line and from the machineries used. This kind of impact is particularly major in neighbourhood that are very serene and quiet or that have sensitive receptors such as schools, health facilities, settlements and places of worship. For this project, this impact will be minimal and confined at the project site.

Mitigation measures

- ✓ *The neighbouring community would need to be informed beforehand via notices and advisories of pending noisy periods and their tolerance solicited well before the commencement of civil works*
- ✓ *Observance of strict working hours (8am to 5pm)*
- ✓ *Unnecessary hooting and revving by project vehicles need to be limited at all times*
- ✓ *As a general rule, workers operating equipment (excavator, loader etc.) that generate noise should be equipped with noise protection gear including ear muffs and plugs. Workers operating equipment generating noise levels greater than 80dBA continuously for 8 hours or more should use earmuffs whereas those experiencing prolonged noise levels of 70-80 dBA wear earplugs.*

10.2.3.2. Dust

Particulate matter (PM) and fugitive dust are always produced during site clearance, excavation and spreading of the topsoil. Excavation for removal of overburden may also result in fugitive dust. Particulate matter and dust, depending on the content, can pose a serious health hazard unto the workers and neighbours if not well contained and controlled. Another source of serious dust would be the dust generated by the trucks transporting materials.

Another contributor of dusty environment would be the excavation of soil. Centralized and increased air pollution is also anticipated once the site is operational.

Mitigation measures

- ✓ *Workers in dusty areas on the site should be issued with appropriate PPE, according to their nature of work and working area*
- ✓ *Covering of all haulage vehicles carrying materials*
- ✓ *Limiting speed of vehicles*

10.2.3.3. Generation of exhaust emissions

Exhaust emissions are likely to be generated during the construction period by the various construction machinery and equipment. Motor vehicles used to mobilize the work force and materials for construction would cause a potentially significant air quality impact by emitting pollutants through gaseous exhaust emissions. However, this will only be on a temporally basis.

Mitigation measures

- ✓ *Workers in dusty areas on the site should be issued with appropriate PPE, according to their nature of work and working area*

- ✓ *Limiting idling time of vehicles and equipment, observing common sense approach to vehicles and equipment use and encourage workers to shut off vehicle engines whenever possible is very important*
- ✓ *All project vehicles should regularly be inspected, maintained and serviced to ensure they burn fuel efficiently to reduce emissions. Un-roadworthy vehicles should not be allowed to transport materials.*

10.2.3.4. Loss of vegetation cover

Currently, the proposed project area has vegetation cover and trees. The project will clear any vegetation present in the area to pave way for the new railway line and maintenance of the port railway lines near the link span. However, utmost care shall be taken to ensure that vegetation loss is kept to a minimum.

Mitigation measures

- ✓ *Except to the extent necessary for establishing the operation site and carrying out the excavation works, vegetation shall not be removed, damaged or disturbed nor should any unauthorized cutting of vegetation take place*
- ✓ *The clearance of the site for any other purposes shall be kept to a minimum. The use of existing cleared or disturbed areas, stockpiling of materials etc. shall be encouraged*
- ✓ *Areas to be cleared should be agreed and demarcated before the start of the clearing operations*
- ✓ *Clearing and removal of vegetation, must be carried out in such a way that damage to adjacent areas is prevented or minimized*
- ✓ *Rehabilitation and re-vegetation of the site with native species where possible is highly recommended*
- ✓ *We propose compensatory tree planting at a ratio of 1:3. Seedlings should be given to the nearby schools, churches and other public places nearby*

10.2.3.5. Increased Solid Waste Generation

A lot of solid waste will be generated from soil excavations and construction material remains as well as their packaging materials. Pollution risks may arise from dumping of these waste materials which in turn may lead to surface and ground water pollution. The contractor should ensure full compliance with the EMCA (Waste Management) Regulations, 2006 as well as the following measures:-

Mitigation Measures

- ✓ *Use an integrated solid waste management system through the following options: i) waste source reduction, ii) material reuse and recycling, and, iii) combustion*
- ✓ *Dispose waste more responsibly in appropriate designated dumping sites*
- ✓ *Use building materials that have minimal or no packaging to avoid the generation of*
- ✓ *excessive packaging waste*
- ✓ *Provide waste collection sites and facilities within the site*

Handling of Asbestos Containing Material

The following steps will be necessary for the main contractor to ensure, as far as is practicable, the prevention of contamination by asbestos from the site and also to ensure that asbestos containing materials are stored, labeled and disposed of appropriately.

The following precautions shall be observed when removing asbestos materials from the buildings:

- ✓ *Secure the site to prevent unauthorized persons and to restrict movement*
- ✓ *Wet the asbestos sheets before removal. If asbestos sheets should begin to crack or crumble, immediately wet the cracked or broken areas with the pintsize spray bottle or garden pump sprayer.*
- ✓ *Remove pieces of asbestos sheets by pulling any fasteners (nails, screws, rivets) or cutting fastener heads so as to minimize breakage. If necessary, carefully lift asbestos sheets with pry tools to expose the fasteners' heads.*
- ✓ *Do not slide asbestos sheets over each other.*
- ✓ *Carefully lower removed asbestos sheets to the ground. Do not throw or drop it.*
- ✓ *Care should be taken not to stand or sit on the asbestos sheets to avoid breakage.*
- ✓ *The workers removing the asbestos must have the appropriate Personal Protective Equipment, which must be removed as they enter the shower room immediately after removal of the asbestos.*

Temporary Storage

If the asbestos must be stored in containers before disposal, it must be ensured that the containers are secured from accidental or deliberate damage, access by staff and the general public.

- ✓ *Temporary storage refers to the time between removal and final disposal of asbestos waste. The duration for temporary storage of asbestos waste should not exceed thirty (30) days from the time of removal.*
- ✓ *The temporary site should be within the premises where the asbestos materials are being removed.*
- ✓ *The removed bulky asbestos, such as roofing sheets, beams, joists, and studs, should be stacked and wrapped, into stacks which can be easily loaded into the transportation vessel, in a plastic sheet of a minimum of 500 gauge double wrapped and secured with tape and labeled*

Any debris (broken pieces) should be collected in a sealed polythene woven bag or any other airtight container. The bags should then be wrapped, into stacks, which can be easily loaded into the transportation vessel, in a polythene sheet awaiting final disposal.

- ✓ *The bags should be considered full when half full and should be tightly sealed or when filled up to a level where the open neck can be twisted tightly, folded over into a*

"gooseneck," and the ends sealed to the side of the bag with heavy plastic tape such as duct tape.

- ✓ *Care should be taken to ensure that sharp pieces do not puncher the bags/ wrappers*
- ✓ *Removed asbestos sheets should not be allowed to lie about the site where they may be further broken or crashed by machinery or site traffic.*
- ✓ *The storage area must have restricted entrance and locked or secured on a 24 hour basis.*
- ✓ *Warning label ("Asbestos hazard area, keep off") and danger signs should be affixed to each wrapped stack or storage area using English, Swahili and local language.*

NOTE: KR intends to temporarily store the asbestos removed from the roofs in the asbestos holding area within its premises before disposal. This area contains asbestos roof materials which have been stored for between 4-6 months. The asbestos will be covered in an impermeable plastic material temporarily before final disposal approved by NEMA.

The contractor shall therefore be required to strictly adhere to the above storage procedures.

Preparation for Transportation

Material containing asbestos or contaminated with asbestos must be viewed as hazardous and packaged to keep fibers from getting into the air. Containers used for packaging may be hard or flexible and must seal airtight. The following are some of the precautions that should be observed in the packaging.

- ✓ *The waste transporting vessel must be lined with a 500 gauge double wrapped plastic sheet with every seam sealed with a tape and covered.*
- ✓ *The transportation vessel should be labeled "Danger - Contains Asbestos Fibers. Cancers and Lung Disease Hazard "and contain the following information: (i) the identity of the hazardous waste. (ii) the name, physical address and telephone contact of the generator of waste*
- ✓ *The bags and stacks should be gently loaded into transportation vessel.*
- ✓ *The goosenecks should not be used as handles for carrying the bags, because that might unseal the ends or tear the bags. Tossing the bags into a waste transporting vessel must be avoided because of the risk of rupture.*
- ✓ *The asbestos waste should be transported by NEMA accredited transporter of such hazardous materials to a prepared disposal site that is authorized by NEMA.*

Transportation

The vehicle transporting the asbestos waste should be licensed as per the EMCA (Waste Management) Regulations, 2006 and must be accompanied by a tracking document. The waste shall be transported to the disposal site in an enclosed vehicle or container, capable of being washed without lodgment of debris and fibers, and secure from escape of fibers to the atmosphere.

KR should ensure that all persons involved in handling and disposal of asbestos are trained in emergency operating procedures. These procedures shall include how the waste is to be

handled, services to be contacted during such an exposure, and additional personal protective equipment's

Disposal Site

Disposal of asbestos must be at a site;

- ✓ *Designated by the County Government and licensed by NEMA;*
- ✓ *Privately owned disposal facility licensed by NEMA;*
- ✓ *Designated by the waste generator (on-site disposal).*

Where a designated site by the local authorities or privately-owned facility does not exist the waste generator shall identify an appropriate site.

The disposal site should be as per specifications in the EIA report. However, the following minimum conditions must be observed:

- ✓ *The optimal distance of the disposal pit shall be as far as practicable from the nearest human settlement and as it shall be determined by the Ministry of Public Health and Sanitation.*
- ✓ *A lined pit that does not reach the water table or according to other standards that maybe approved by NEMA.*
- ✓ *Disposed material to be one meter below ground level.*
- ✓ *Disposal site should be fenced off appropriately and the gate locked.*

Disposal Operation

The waste generator shall ensure that the following precautions are observed when disposing asbestos wastes:

i) The waste generator shall notify the Authority on commencement of disposal activities.
ii) Asbestos materials must not be reused or offered for sale.
iii) All asbestos sheets and the debris should be wrapped before it is hauled to the disposal site or transfer station in a covered vehicle.
iv) Asbestos waste must be disposed of at approved disposal sites only
v) The depth of the disposal pit shall be as deep as practically possible to accommodate more asbestos waste but at least one (1) meter above water table.
vi) The asbestos should be lowered gently into the disposal site and should not be dropped from any height to avoid breakage.
vii) When all available asbestos has been lowered into the pit, cover with polythene paper followed by 15cm layer of soil. Continue doing this until the pit is full or the waste is finished.
viii) The pit shall be considered full when the asbestos waste is 100cmbelow the ground level or the asbestos waste is exhausted.
ix) After the pit is full, cover with 500 gauges double wrapped polythene sheet and fill the pit with layer of soil up to the ground level.
x) Disposal site should be completely fenced off with at least chain link and a lockable gate which shall be locked at all times. The fence should be at least one (1) meter from the edge of the pit.

xi) Warning notices stating "Asbestos hazard area, keep out" shall be placed at the disposal site. These signs, with lettering of minimum 150mm in height, are to be placed so that they are clearly visible.

Post-Disposal

All transportation vessels, re-useable containers or any other similar article which have been in contact with asbestos waste shall be cleaned at the disposal site.

i) The disposal site should be maintained including the warning signs, the fence, the gate among others to prevent vandalism and interference.
iii) Human activities which might interfere with the buried asbestos waste such as construction and pitting should not be allowed at the disposal site.
iv) The waste generator shall notify the Authority in writing on completion of disposal of asbestos waste.

10.2.3.6. Pollution of water resources

Possible pollution of water resources would have to coincide with rainy season when the runoffs and floodwaters carry the disturbed soils to the water body.

Mitigation measures

- ✓ *The Proponent would need to put all the necessary measures to prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to adjacent watercourses and/or water bodies*
- ✓ *Extra care should be taken during entire works to limit water pollution from any other sources.*
- ✓ *No changing of engine oils, handling of fuels and any other potential pollutants next to the water bodies*

10.2.3.7. Destruction of soil structure and soil erosion

The new railway line is located in an area that previously did not have any development projects. Destruction of soil structure during digging of the topsoil would be a major impact.

Though these activities are localized to the project site, they still disrupt ecosystems and microbiological communities. Removal of the protective grass cover of the soil and digging will also loosen the particles, making the soil on site vulnerable to agents of erosion.

Mitigation measures

- ✓ *Immediate re-vegetation and landscaping works to be carried out after the works to protect soils that might have been exposed*
- ✓ *Disturbance and excavation to be limited to just the project footprint area*
- ✓ *The topsoil that had been removed during foundation digging can be reused to fill or landscape the project area*

10.2.3.8. Loss of property and assets

Apart from land, a number of other properties and assets will be affected along the proposed railway line because of several reasons, which include;

- Encroachment on railway reserves for both human settlement and commercial purposes
- Private developers with property on or close to the rail corridor several properties will be affected.

10.2.3.9. Increased risk to the public

The potential increase in risk associated with this project will be from two sources: accidental falls into the excavated trenches or traffic accidents resulting from material transportation from site to point of use. Falling into the trenches can lead to injury to human beings or livestock. It should also be mentioned that the possibility of death from such falls would be low because the depth of the trenches would not be that high. There would be increased traffic in the area as the trucks move to and from the project site. Nonetheless, the possibility of a traffic accident is low because the project area has very low population density. Chances of interaction between human beings and or livestock with the project site and project activities exist but are limited.

Mitigation measures

- ✓ *Need for traffic controls like speed bumps and traffic signs limiting speed when approaching sensitive areas (near villages and other populated areas)*
- ✓ *Public awareness, informing the villagers of the potential dangers of going to the site may be appropriate*
- ✓ *Restricting unauthorized access to the project site. A local site guard would need to be employed to maintain this directive*
- ✓ *Mark the area with warning tapes until the trenches have been backfilled*

10.2.3.10. Disturbances to public utilities

The developer will relocate all facilities affected in consultations with various parties affected with respect to water, sewerage, pipelines, electricity, old rail, roads, etc.

Mitigation measures

- ✓ *Relocation of electricity poles, water pipes and service cables within the extension portions of the port in collaboration with local utilities services providers*

10.2.3.11. Hazards to workers

Occupational health and safety issues

Inadequacies in provisions for working conditions - safe working environment is normally assured when code of practices in the working place are instituted. Failure during the design to provide for and integrate health and safety (e.g. proper personal protective gear) and ensure there is a distribution of responsibility and accountability for health and safety to all employees at all levels may lead to accidents, injuries to

workers, loss of lives and/or of property. Mobilization and construction activities are rife with activities that may cause risk of serious injuries, fatalities to workers these include motored / sharp edged equipment, explosives (where required to blast rocks) etc. Construction works use various noise-emitting heavy power equipment and tools and engines including compressors, generator and mixing machinery. Noise is expected to be generated from vehicles and trucks transporting construction equipment and from crew and if applicable from blasting.

Noise levels from vehicles are about 65 dB. Also fire risk at base camps made of tents or thatch-roofed. Occupational health hazards may also be promoted by lack of procedures that mitigate negligence at work, fatigue due to understaffing and long working hours, employing wrong people on particular jobs (e.g. employing an unskilled person to handle dynamite explosives), lack of protective gear, low morale, etc.

Health Hazards/Disturbance and Nuisance

Transportation and construction hazards to public could emanate from vehicles causing accidents, congested traffic, material spillage etc; air pollution from emissions of exhausts of trucks, equipment and dust from loose earth roads; and noise generated from vehicles and trucks transporting construction equipment and from crew. Construction works use various noise-emitting heavy power equipment and tools and engines including, compressors, generator

Mitigation Measures

- ✓ *Performance Standards and regulations on health and safety requirements.*
- ✓ *Personal Protective Equipment (PPE), reasonable working hours and good working conditions and facilities.*
- ✓ *Develop and implement in-house manual/ guard lines on Health and Safety (H&S)*
- ✓ *Enforcement of site security*
- ✓ *Screening of security personnel*
- ✓ *Prohibition of alcohol and drugs within the site*

HIV-AIDS and COVID-19

Assuming that some workers will be recruited from other parts of the country where AIDS infection rate is comparatively high (the national average is 5%), then there is the possibility of an increase in new HIV-AIDS infections in the project area. The implication is that due to the low population density, any new infections will increase the overall infection percentage substantially. Prevention of the transmission of HIV- AIDS and other STIs therefore represents the single most important public health issue that is predicted to be associated with the project.

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus is caused by the virus SARS-CoV-2. WHO continues to collaborate with experts, Member States and other partners to identify gaps and research priorities for the control of COVID-19, and provide advice to countries and individuals on prevention measures.

Mitigation Measures

- ✓ *The Contractor will be required to develop a health and safety policy and procedures and educate all workers on the policy and the procedure Health authorities should conduct a biannual audit of occupational health and safety within all premises of the contractors and at sites of works as required by law:*
- ✓ *Workers will be informed about diseases that are prevalent in the project area, and how they can minimize their exposure to, and the transmission of, such diseases;*
- ✓ *Contractor will mount regular HIV-AIDS awareness campaigns and avail condoms to construction crews;*
- ✓ *Staff to be screened for high fever*
- ✓ *Contractor to provide staff with hand washing facilities or sanitizers at specific points of entry*
- ✓ *Contractor to provide face masks*
- ✓ *Contractor to ensure social distancing is enforced while at work*
- ✓ *The Contractors will be advised to liaise with the available health facilities for medical services when required. Health service providers will be regularly consulted to determine any changes in disease patterns which may be associated with rail rehabilitation;*

10.2.4. Potential Negative Impacts (Operation Phase)

10.2.4.1. Loss of employment opportunities

The project will therefore ensure a seamless movement of cargo from Mombasa port to Malaba. This will in turn reduce the number of long distance trucks plying the Nairobi-Malaba highway in the long-term hence loss of jobs for truck drivers, reduced revenue for truck owners and mechanics. Workers in related businesses like mechanics, oil recyclers, hotels, shops etc. along the main road will also be affected adversely.

Mitigation measures

- ✓ *Consider employing locals in job allocations especially for activities requiring unskilled labour*

10.2.4.2. Disruption and change of local livelihoods/ outward migrations The project is expected to lead to major disruption and change of local livelihoods of people directly or indirectly depending on long-distance trucks. This will include drivers, mechanics, turn-boys, truck owners, other related/ supportive business owners, Commercial Sex Workers, vendors among others. When operations will start these group of people are expected to either change their main source of dependence/ livelihood or migrate to other towns/ regions where the trucks will be operating and even to other countries in the East African Region. Some workers may have to change their skill to suit the new opportunities that will arise. This will require time and resources to re-train.

Mitigation measures

- ✓ *Consider employing locals in job allocations especially for activities requiring unskilled labour*

10.2.4.3. Increased crime rates

Business enterprises will be affected thereby disrupting sources of income and livelihood of truck drivers, turn boys and residents. As a result, social crime rate in the area is expected to rise with the beginning of the operations as people who have experienced job loss might resolve to go into crime to earn their daily livelihood. Local residents will interact with other cultures especially during operation, due to increased number of new workers in town.

Mitigation measures

- ✓ *Consider employing locals in job allocations especially for activities requiring unskilled labour*

10.2.4.4. Loss of vegetation cover

Regular maintenance of vegetation within rail track alignment is necessary to avoid interference with train operations and track maintenance. Unchecked growth of trees and plants can disrupt signals, fall onto the tracks and overhead power lines, and prevent workers from getting to places of safety when trains are passing. Regular maintenance of the way leave to control vegetation may involve the use of mechanical methods (for example mowing), manual methods (such as hand pruning), and use of herbicides. Vegetation maintenance beyond that which is necessary for safety may remove unnecessary amounts of vegetation, resulting in the continual replacement of successional species and an increased likelihood of the establishment of invasive species.

Mitigation measures

- ✓ *The way leave clearance shall be kept to a minimum. The use of existing cleared or disturbed areas, stockpiling of materials etc. shall be encouraged*
- ✓ *Areas to be cleared should be agreed and demarcated before the start of the clearing operations*
- ✓ *Clearing and removal of vegetation, must be carried out in such a way that damage to adjacent areas is prevented or minimized*

10.2.4.5. Increased Solid and Liquid Waste Generation

Domestic waste from offices can lead to land pollution. Pollution risks may arise from dumping of these waste materials which in turn may lead to surface and ground water pollution. KR should ensure full compliance with the EMCA (Waste Management) Regulations, 2006 as well as the following measures:-

Mitigation Measures

- ✓ *Use an integrated solid waste management system through the following options: i) waste source reduction, ii) material reuse and recycling, and, iii) combustion*
- ✓ *Dispose waste more responsibly in appropriate designated dumping sites*
- ✓ *Provide waste holding bins and skips for temporarily holding wastes generated facilities within the site*

- ✓ *Regularly and appropriately dispose the wastes collected*

10.2.4.6. Pollution of water resources

Pollution of water resources would have to coincide with rainy season when the runoffs and floodwaters carry the disturbed soils to the water body, oil spills during change of lubricants, cleaning and repair processes in the maintenance of locomotives.

Mitigation measures

- ✓ *The Proponent would need to put all the necessary oil spill containment measures to prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to adjacent watercourses and/or water bodies*
- ✓ *No changing of engine oils, handling of fuels and any other potential pollutants next to the water body*
- ✓ *General kit contents could include: oil absorbent pads; absorbent socks; granular absorbents; and protective equipment such as gloves, goggles and protective suits. All kits will be stored in a visible location, and in appropriate weather-resistant containers. Regular inspections of the kits will be performed to ensure that they are complete and all materials remain functional.*
- ✓ *The collected oil should be collected for proper disposal by licensed waste collectors*

10.2.4.7. Noise pollution during operation phase

Sources for noise pollution will include rolling noise generated by the contact between wheel and rail during normal movement and braking; aerodynamic noise generated by the train pushing air (particularly for high speed trains); and traction noise generated by the engine and cooling fans.

Specifically during the operation phase, main noise sources along the railway, exerting certain impact on acoustic environment of the area within 200m to both sides of the railway line, are train running and whistling, shunting at the railway stations, departing, arriving and locomotive servicing work.

Mitigation Measures

- ✓ *Personal Protective Equipment (PPE), reasonable working hours and good working conditions and facilities.*
- ✓ *Develop and implement in-house manual/ guard lines on Health and Safety (H&S)*
- ✓ *Adhering to the provisions of Noise Prevention and Control Rules 2005, Legal Notice no. 24 regarding noise limits at the workplace as well as NEMA Noise and Excessive Vibration Pollution Control Regulations, 2000*

10.2.4.8. Increased risks of train accidents to the public and accidental spills

The most significant safety issues for any railway operation are derailments, collisions, fires and explosions (including sabotage/terrorism), falls from the trains, collision with road transport and people at level-crossings, the risks associated with stationary sources of pollution (like fuelling stations), accidental spillages and so on.

Mitigation measures

- ✓ *Need for traffic controls like speed restrictions and traffic signs limiting speed when approaching sensitive areas (near villages and other populated areas)*
- ✓ *Public awareness, informing the community of the potential dangers*
- ✓ *Mark the area with warning signs at various level crossings with st. Andrews mark*
- ✓ *Use of tank cars and other rolling stock that meet national and international standards (e.g. thermal protection and puncture resistance) appropriate for the cargo being carried, and implementing a preventive maintenance program*
- ✓ *Develop a Spill Prevention and Response Plan (SPRP) will be developed for use by Kenya Railways based on an analysis of hazards, including the nature, consequence, and probability of accidents.*
- ✓ *All spills occurring on the project site will be responded to in a way that will uphold the following priorities: protection of human life and health; protection of the environment; protection of property; and minimized disruption to operational activities. At all times, applicable regulations will be used to guide response and cleanup activities.*
- ✓ *Have appropriate Spill response kits will be located at material handling and storage locations. The contents of the kits will be based on the potential risk associated with the material, volume of material, and environmental sensitivity of the area.*
- ✓ *General kit contents could include: oil absorbent pads; absorbent socks; granular absorbents; and protective equipment such as gloves, goggles and protective suits. All kits will be stored in a visible location, and in appropriate weather-resistant containers.*
- ✓ *Regular inspections of the kits will be performed to ensure that they are complete and all materials remain functional.*
- ✓ *Construction of protective barriers and other technical measures (e.g. drainage / receptacle provisions) at sensitive locations (e.g. water resources and settlements)*
- ✓ *Dissemination of emergency preparedness and response information to the potentially affected communities (e.g. emergency notification systems and evacuation procedures);*
- ✓ *Implementation of a hazardous material security plan and security awareness training, including provisions for personnel security, prevention of unauthorized access, and measures to reduce risks during storage and transport of hazardous materials;*
- ✓ *Use of standardized fuel spill prevention system for locomotive fueling, including automatic shut-off systems.*

10.2.4.9. Hazards to staff Occupational health and safety issues

Noise levels from vehicles are about 65 dB. Also fire risk at the port. Occupational health hazards may also be promoted by lack of procedures that mitigate negligence at work, fatigue due to understaffing and long working hours, employing wrong people on particular jobs (e.g. employing an unskilled person to handle dynamite explosives), lack of protective gear, low morale, etc.

Mitigation Measures

- ✓ *Performance Standards and regulations on health and safety requirements.*
- ✓ *Personal Protective Equipment (PPE), reasonable working hours and good working conditions and facilities.*
- ✓ *Develop and implement in-house manual/ guard lines on Health and Safety (H&S)*
- ✓ *Enforcement of security*
- ✓ *Screening of security personnel*
- ✓ *Prohibition of alcohol and drugs at the workplace*

11. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

11.1. Significance of the ESMP

The ESMP provides a logical framework within which identified negative environmental impacts can be mitigated and monitored. The ESMP also assigns responsibilities of actions to be taken. The ESMP is a very important output of an EIA since it provides the framework or checklist for project monitoring and evaluation / audit. Some of the mitigating measures proposed will be incorporated into the project design.

11.2. Implementation and Management of the ESMP

This EMP implementation covers project operation and decommissioning. Typically, pre-construction phase should be included where requirements for environmental management and mitigation measures and social safeguards are included in contracts of the construction contractors.

The oversight and responsibility for implementation during the operation period still remains with the Proponent.

Regardless of the stage of implementation of the project, the Proponent is still responsible for ensuring that the project is implemented in accordance with best industry practices as well as workplace health, safety and environmental (HSE) standards.

During the decommissioning phase, the Proponent will assign adequate budget and a proper implementation schedule for all mitigation measures specified in the EMP. In addition, the specific roles and responsibilities will be assigned to project personnel, such as safety and health management roles.

11.2.1. Implementation of Corrective Action(s)

There are several mechanisms for implementing corrective action, both during the operation and decommissioning phases. The main mechanisms to address transgressions include verbal instruction (in the event of minor transgressions from established procedure, usually following a site inspection); written instruction (identifying sources of problems, usually following an audit) and issuance of contract notice (following possible breach of contract).

11.2.2. Documentation / Reporting

The findings of all of the above should be structured into instructive reporting that provides information to all required parties on environmental performance, social safeguards, together with clearly defined corrective actions, where necessary. Monitoring and inspections reports should be generated continuously. In addition, a

review function should be created within the reports, in order to allow for continuous assessment of the reports and suggestion of corrective actions, where necessary.
These reports should include the provision of information on the environmental performance and social safeguards to external stakeholders, agencies and surrounding communities.

Table 6: Environmental and Social Management Plan

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
CONSTRUCTION/ RENOVATION PHASE						
Solid waste generation	• Quantify the building materials correctly to avoid wastage • Have regular disposal of waste generated • Excess material can be sold or donated to other projects or be used to improve roads within the site • Select durable and quality products that will not degrade within a short time so as to need replacement • Store materials properly to avoid wastage by damage • Materials to be reused or recycled where possible • Wastes generated during the renovation and construction phase will be disposed of as stipulated in the EMCA(Waste Management) Regulations 2006 • Conduct training for waste management, such as waste disposal and segregation practices	Waste bins Waste segregation signage	Reduced pollution Minimal Wastes generated on site	Contractor/ Project Engineer	Throughout the construction and rehabilitation period	- 15,000

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
Asbestos Roof Removal	• Dispose all Asbestos Containing Materials according to WBG/IFC EHS Guidelines NEMA Guidelines/ requirements • Use recommended PPE • Conduct Risk Assessment before removal of ACMs • Keep an updated inventory of all ACMs in the work place • Notify NEMA by filling in the notification form • Ensure that all asbestos containing materials are clearly marked and visible. • Develop safe work procedures • Instruct all workers who would be exposed • Ensure that work is carried under the supervision of experienced and qualified personnel • Keep accurate and complete records regarding asbestos management	Total Number of Holding days	Disposal of Asbestos Containing Materials	Contractor/ Project Engineer	Before completion of construction	Costs build in the planning and administration costs of the contractor
Noise Pollution	• Use low noise machinery • Ear muffs to be given during construction • Use properly maintained machines	Noise Monitoring Register of PPE provided to persons	Minimal Complaints from Staff and neighbouring	KR/ Project Engineer	Throughout the construction and	TBD

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
	• Switch off noisy machinery when not in use • Restrict noisy activities/ machines to daytime • Regular maintenance of machinery	exposed to high noise	community		rehabilitation period	
Loss of vegetation	• Except to the extent necessary for establishing the operation site and carrying out the excavation works, vegetation shall not be removed, damaged or disturbed nor should any unauthorized cutting of vegetation take place	Minimal vegetation disturbance	Zero siltation of water bodies Minimal dust	KR/ Project Engineer	Through out the construction and rehabilitation period	1000,000
Land degradation	• Vegetate and mulch progressively as each section of works is completed. The interval between clearing and vegetation should be kept to an absolute minimum; • Avoid wherever possible clearing areas of highly • erodible soils and steep slopes which are prone to water and wind erosion; • Embank slopes to avoid erosion	Vegetation of slopes Maintenance of soil erosion devices Annual audits to monitor and Analyse soil samples from the spill affected area in comparison to the baseline Conditions	Stable soils in disturbed areas Absence of contaminated soils by spills	KR/ Project Engineer	Through out the construction and rehabilitation period	500,000

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
Alteration of the Natural drainage system	• Improve the existing natural drainage systems. • Monitor the natural flow system during heavy rains and make improvements where necessary. • Clear blocked drainage channels by installing open culverts	• Monitor drainage systems	Functional drainage system	KR/ Project Engineer	Through out the construction and rehabilitation period	200,000
Staff safety	• Provide safety and protective clothing to workers • Use machines and appliances that are well maintained and make sure that the handlers are well trained • Have an emergency response for all kinds of emergencies plan ready at the site at all times • Train workers on safety measures • Store materials that can potentially harm workers and passersby in a safe mode when not in use • Put up signs and posters to warn people of hazardous material and dangerous appliances and machinery	• Good housekeeping • Register of PPE provide to persons exposed to dust • Enforcement of safety policy	Zero incidents	KR Project Engineer	Through out the construction and rehabilitation period	Standard conditions of contract for Insurance Costs build in the planning and administration costs of the contractor
Worker Health and Sanitation	• Contractor to provide clean and adequate sanitation facilities for the workers at all times • Contractor shall also provide clean drinking water at the construction site	• Number of sanitation facilities • Sanitation facilities	Observation Reports	Contractor/ Project Engineer	Through out the construction and rehabilita	TBD

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
	for his workers at all times •	cleanliness • Number of disease outbreaks			tion period	
HIV/AIDS, STDs	• Maintain a continuous awareness program on health issues related to STDs and HIV/AIDS at the market, e.g. installing posters at the market	• No of testing, counselling provided • Prevalence of prostitution, HIV/AIDS and STDs in the area during construction period	Reports	Contractor/ Project Engineer	Throughout the construction and rehabilitation period	300,000
OPERATION PHASE						
Solid waste generation	• Provide solid waste handling facilities such as waste bins across the vessel and ensure that they are often emptied to enhance maximum cleanliness. • Ensure that solid waste generated, is regularly disposed of appropriately at authorized dumping sites • Ensure that facility manages its waste efficiently through recycling, reuse and proper disposal procedures. • Appoint a NEMA licensed waste handler • Compost biodegradable waste for	Waste bin Waste Segregation Environmental inspections and audits	No littering	KR	Periodical Continuous	480,000 40,000/month

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
	use on flower gardens as manure at the stations where possible • Conduct training for waste management, such as waste disposal and segregation practices •					
Energy consumption	• Switch off electrical equipment, appliances and lights when not being used • Install energy saving fluorescent tubes at all lighting points within the port and vessel which consume higher electric energy	Enforce energy management policy Environmental inspections and audits	Reduced energy consumption	KR	Continuous Periodical	- 150,000/-
Increased Water Consumption	• Promptly detect and repair of water pipe and tank leaks. • Ensure taps are not running when not in use • Install a discharge meter at water outlets to determine and monitor total water usage	Enforce energy management policy Environmental inspections and audits	Reduced water consumption	KR	Continuous Continuous Once	10,000/- per Month 120,000
Accidental Spills	• Reporting of all environmental incidents to the relevant authorities • Develop and implement a Spill Prevention and Response Plan (SPRP)	Have an emergency response plan Environmental	Minimal or Zero levels of oil from water samples	KR	Periodical Throughout	TBD

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
	• Have adequate spill kit equipment to handle large cases of oil spills • Prevent spills from entering drains or water courses • All spills to be cleaned-up as soon as safe, weather and access permitting • Any contaminated soil and clean-up materials should be collected and placed in a labelled container for disposal off-site through by licensed contractor • Train staff on spill control • Train staff on transportation of Dangerous goods and safe working procedures	inspections and audits				
Solid waste	• Appoint a NEMA licensed waste handler • Compost biodegradable waste for use on flower gardens as manure at the stations where possible	Waste bins Waste segregation signage	Reduced pollution Minimal Wastes generated on site	KR	Through out	40,000
Hazardous waste	• Segregate hazardous waste • Appoint a NEMA licensed waste handler for safe disposal of hazardous waste	Waste bins Waste segregation signage	Reduced pollution Minimal Wastes generated on	KR	Through out	Standard conditions of contract for Insurance

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
		The condition of spill kits will be regularly inspected	site			Costs build in the planning and administration costs of the contractor
Waste Water	• Ensure waste water is disposed off in compliance with the EMCA (waste waster) regulations 2006	Environmental inspections, monitoring and audits	No water pollution	KR	Continuous	-
Noise	• Regular maintenance of locomotives • Avoid unnecessary revving and idling of engines • Provide staff with appropriate PPE	Environmental inspections, monitoring and audits	Number of complaints received	KR	Quarterly	TBD
Storage of hazardous	• Ensure all hazardous materials (including fuels) are stored in bunded/secure enclosures at the railway stations • Ensure that each hazardous material has a copy of material safety data sheet (MSDS) from manufacturer • Label each storage container accordingly • Ensure that only minimum required quantities of hazardous substances will be stored at the sites/ stations	Environmental inspections and audits	Zero Spills Zero Pollution			100,000
Fire Risks	• Install Firefighting equipment • Ensure firefighting equipment are	Fire safety preparedness	Zero fire incidents	KR	Continuous	Standard conditions of

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
	inspected semi annually • Conduct regular fire drills • Appoint fire marshals • Display emergency numbers on the notice boards					contract for Insurance Costs build in the planning and administration costs of the contractor
security of the premises and surrounding areas	• Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises during night hours.	Restricted stations	Zero incidents	KR	Continuous	Standard conditions of contract for Insurance Costs build in the planning and administration costs of the contractor
Staff safety and welfare	• Provide safety and protective clothing to workers • Use machines and appliances that are well maintained and make sure that the handlers are well trained • Have an emergency response for all kinds of emergencies plan ready at the site at all times • Train workers on safety measures	Good housekeeping Register of PPE Enforcement of safety policy Annual audits	Zero Incidents	KR	Continuous	Standard conditions of contract for Insurance Costs build in the planning and administration costs of the contractor

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
	• Store materials that can potentially harm workers and passersby in a safe mode when not in use • Put up signs and posters to warn people of hazardous material and dangerous appliances and machinery • Provide staff with wholesome drinking water					
Traffic disruption/ Level crossing collisions	• Installation of visible St. Andrews level crossing signage for road user • Speed restrictions near level crossings • Installation of rumble strips on the roads near level crossings	Driver /community sensitizations	Number of reported level crossing incidents	KR KeNHA KeRRA	Continuous	1,000,000

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
DECOMISSIONING PHASE						

Expected negative impacts	Recommended mitigation measures	Monitoring Requirements	Performance Indicators	Responsible party	Time frame	Costs (Kshs)
Solid waste generation	• Power disconnection • All installations, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible • All foundations must be removed and recycled, reused or disposed of at a licensed disposal site • Wastes generated during the decommissioning phase will be disposed of as stipulated in the EMCA(Waste Management) regulations of 2006 • Provide staff with adequate PPE • Use of properly serviced vehicles • Adhere to spill response procedures • Provision of adequate signage to direct traffic flow within the site • Provide a standard first aid kit on site	Waste bins Waste segregation signage contra	Reduced pollution Minimal Wastes generated on site	KR	Once Once	1,000,000/- 150.000/-

12. CONCLUSION AND RECOMMENDATIONS

12.1. Conclusion

The proposed project main goal is to rejuvenate existing railways infrastructure that is serving Rift Valley and Western regions. It will play an important role in strengthening cooperation among the counties and promote national economic development.

12.1.2. Project Benefits

This EIA study anticipates that Kenya Railways will ensure that it is implemented and managed on sound socio-economic, socio-cultural, socio-political and environmentally sustainable basis.

12.2. Recommendations

A summary of the recommendations for the prevention and mitigation of potentially adverse environmental and socio-economic impacts are stated below:

- ✓ Ensure the views expressed by the community during public involvement exercise are integrated in the implementation plan of the project, especially where aspects of social interest are concerned
- ✓ Institute effective communication, education and awareness towards the project beneficiaries for enhanced acceptability and social harmony
- ✓ The Proponent should ensure the host communities benefit from employment opportunities as per the proposed project
- ✓ The operation and maintenance of the proposed project must comply with the best management practices and the principles of environmental management including the principles of sustainability, intergenerational equity, prevention, precaution and polluter pays
- ✓ All solid waste materials and debris resulting from construction activities including the asbestos containing materials shall be disposed of at approved dumpsites and according to local and international regulations. The wastes should be properly segregated and separated to encourage recycling of some useful waste materials; i.e. some excavated stone materials can be used as backfills.

This ESIA determined that if the proposed works are implemented with due attention to the mitigation and management measures outlined, it will not pose any serious adverse and negative environmental and social impacts. The project has also been regarded as environmentally sound.

This Project is feasible with a perspective of social economic evaluation, financial evaluation and environmental assessment, which has stable economic benefit and strong anti-risk capacity. The study of alternative planning shows this project is indispensable. Therefore, the project is necessary, and should be implemented as soon as possible. Given the magnitude and complexity of the project, a comprehensive Environmental Management Plan (EMP) has been developed of which the proponent will implement to ensure minimal damage to the environment. We therefore, recommend the project for NEMA approval because of its enormous contribution to achievements of

Kenya's Vision 2030 goals. Overall, the purpose of proposed project is considered strategic and beneficial and should be allowed to proceed.

REFERENCES

1) Constitution of Kenya @ www.kenyalaw.org
2) Kenya Railways Act www.co.ke
3) Kenya gazette supplement Acts 2000, Environmental Management and Coordination Act Number 8 of1999. Government printer, Nairobi
4) Kenya gazette supplement number 56. Environmental Impact Assessment and Audit Regulations 003.Government printer, Nairobi
5) Kenya gazette supplement number Environmental Management and Coordination (Emissions Control) Regulations, 2006 Government printer, Nairobi
6) Kenya gazette supplement Environmental Management and Coordination (Water Quality) Regulations, 2006
7) Kenya gazette supplement Environmental Management and Coordination (Waste Management) Regulations, 2006.
8) Kenya gazette supplement Environmental Management and Coordination (Excessive Noise and Vibration Control) Regulations, 2009.
9) Kenya gazette supplement, Special Issue 51, Legal Notice number 19; Environmental Management and Coordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009Government printer, Nairobi.
10) Kenya gazette Legal Notice No. 13211 Environmental Impact Assessment and Audit Regulations 2003(Review of Environmental Impact Assessment Fees). Government printers, Nairobi.
11) Kenya gazette supplement Acts Building Code 2000 by government printer, Nairobi.
12) Kenya gazette supplement Acts Local Authority Act (Cap. 265) government printer, Nairobi.
12) Kenya gazette supplement Acts Penal Code Act (Cap.63) government printer, Nairobi.
13) Kenya gazette supplement Acts Physical Planning Act, 1999 government printer, Nairobi.
14) Kenya gazette supplement Acts Public Health Act (Cap. 232) government printer, Nairobi.
15) Kenya Gazette Supplement No. 41, Public Health Act (cap. 242), Legal Notice No. 50. Of 2020.
16) Nakuru County Integrated Development plan II (2018-2022).
17) Baringo County Integrated Development plan II (2018-2022).
18) Uasin Gishu County Integrated Development plan II (2018-2022).
19) Kakamega County Integrated Development plan II (2018-2022).
20) Bungoma County Integrated Development plan II (2018-2022).
21) Busia County Integrated Development plan II (2018-2022).

Annex 1: Experts License

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/14586

Application Reference No: NEMA/EIA/EL/19102

M/S **Stellah Cherop Ndiwa**
(individual or firm) of address

P.O. Box 2162-80100, Mombasa

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**

registration number **10011**

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

Issued Date: **3/24/2021**

Expiry Date: **12/31/2021**

Signature…..

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001: 2015 Certified

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/14588

Application Reference No: NEMA/EIA/EL/19785

M/S **Naftal M. Moibi**
(individual or firm) of address

P.O. Box 10392-00100, Nairobi

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**

registration number **2110**

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

Issued Date: **3/24/2021**

Expiry Date: **12/31/2021**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001: 2015 Certified

Annex 2: Stakeholder Engagement Minutes

Minutes of the Public Consultation Meeting Held at Longonot Chief's Camp Office on 24th August 2021 for Rehabilitation Project of Longonot- Malaba MGR Line.

Venue: Longonot(Chief's Camp Office)

Agenda

1. Opening prayer
2. Welcoming Remarks
3. Introductions
4. Project description
5. Social /Environmental Impacts
6. Questions and Answers session

MIN	ITEM	ACTION/REMARKS
	The meeting was held at Longonot Chief's Camp office comprising of the representatives of community members representing the wider Longonot area.	
	The community representatives present adhered to COVID-19 strict protocols/ containment measures including wearing mask, observing social distance and sanitizing.	-COVID-19 Protocols
1.Opening Prayer	The meeting was called to order by the area Chief Mr. Stephen K. Njuguna, who invited the pastor Mr. Peter Kariuki to lead in a word of prayer at 10:30 am.	
2.Welcoming Remarks	The area Chief welcomed all members present to the meeting. The chief gave his opening remarks and informed those present that the meeting had been initiated by Kenya Railway in connection to the ongoing project for the rehabilitation of the Longonot- Malaba MGR Line.	
	He said that he has been in constant communication with KR officers regarding the ongoing projects. He assured members that any issues raised in the meeting would be addressed appropriately.	
	He also affirmed that since this was a government project all were expected to give it the support that it deserves. He also mentioned the expected benefits of the project like improving transport with the neighbouring	

	countries and reducing congestion on the roads.	
3.Introductions	All members present introduced themselves A brief introduction was also done by KR team.	
4.Project Description	Mr. Naftal Moibi gave an explanation for the public participation process as a requirement by EMCA 1999 and that Public participation is concerned with involving, informing and consulting the public in planning, management and other decision making activities. He reiterated that Public participation ensures that due consideration is given to public values, concerns and preferences when decisions are made. He went on ahead to give the project description stating the scope of works and then highlighting the major project activities. The works to be undertaken include but not limited to: **Works** a. Ballast Screening b. Ballasting c. Adjustment of track curves d. Replacing of all rotten timber sleepers e. Renovation of turnouts f. Repair of collapsed culverts g. Opening and clearing drainages h. Level crossing overhauls i. Bridges-Viaducts will be repaired and strengthened j. Station areas will be fenced off for safety and security k. Painting and renovation for all station buildings l. Water reconnection and sanitation facilities m. Asbestos removal	
5.Environmental and Social Impacts	He also presented the possible environmental impacts likely to occur and the ways in which the corporation/ contractor was planning to mitigate those impacts. **Operations Benefits** a. Employment Opportunities b. Seamless movement of cargo	

	c. Decrease in GHG emissions d. Reduced road traffic congestion e. Reduced cost of transportation of goods and Passengers. f. Reduced road maintenance costs g. Increased National Economic status h. Reduction of road accidents caused by HCVs	
	Negative effects a. Solid waste generation,	-Provision of waste segregation Bins and dispose as per the waste Regulations
	b. Increased electricity, diesel, water consumption	-Energy management
	c. Accidental Spillages, Dangerous goods	-Have a spill management plan
	Social Negative Impacts a. HIV /AIDs and Sexually Transmitted Diseases b. Early teenage pregnancies c. Insecurity d. Drugs and Substance abuse	-Community sensitization, campaigns and programmes
6.Questions	**Questions** Mr. Njogu: Requested to know if the project will result to employment of the local since he did not see any locals that have been employed since the project started.	- Contractor shall be requested to give priority for employment of the locals for unskilled tasks.
	Mr. Francis Kibe:- wanted know if as a community they will benefit from any CSR activity since other companies usually have such benefits for the community.	- The community can write a formal request for an agreed project that they need through the Chief's office to KR for consideration. KR to review and discuss with the community the request.
	Mr. Kibunja, a PAP:- complained that all the mitigation measures that have been mentioned have not yet been implemented including a box culvert that was supposed to contain the water flow.	-KR to engage the contractor to address the issue and fix the box culvert
	He also noted with concern that all the employees doing specific hand work on the metals are all from one community, he requested that all should be trained to help them benefit from the job opportunities.	-Contractor shall be advised to give priority for employment of the locals for unskilled tasks.

	Millicent:- Requested to know what will be done to contain the dust. She lamented that the sprinkling of water that is being done is not sufficient for the dust levels .The dust she said was causing them and the children severe illness, she complained that this was a big problem as their clothes on the line gather dust after washing.	-Contractor to increase frequency of water sprinkling to suppress the dust.
	The vibrations from the construction are too much for the people living close to the station area.	-Risk Assessment to be done to ascertain the severity of vibrations.
	CSR Request	
7.A.O.B	One member suggested that as a community the dispensary serves all of them, and they will be happy if a waiting bay for the ambulance was constructed.	- The community can write a formal request for an agreed project that they need through the Chief's office to KR for consideration.
	There being no other business the meeting was closed at 12:00hrs with a word of prayer by pastor Peter Kariuki.	

Minutes of the Public Consultation Meeting Held at Gilgil Railway Station on 25th August 2021 for Rehabilitation Project of Longonot-Malaba MGR Line.

Venue: Gilgil Railway Station

Agenda

1. Opening prayer
2. Welcoming Remarks
3. Introductions
4. Project description
5. Social /Environmental Impacts
6. Questions and Answers session

MIN	ITEM	ACTION/REMARKS
	The meeting was held at Gilgil Railway Station premises comprising of the representatives of community members representing the wider Gilgil Town area.	
	The community representatives present adhered to COVID-19 strict protocols/ containment measures including wearing mask, observing social distance and sanitizing.	-COVID-19 Protocols
1.Opening Prayer	The meeting was called to order by the Chief Mr John K. Thuku, who invited a volunteer to lead in a word of prayer at 09:20 am.	
2.Welcoming Remarks	The area Chief welcomed all members present to the meeting. The chief gave his opening remarks and informed those present that the meeting had been initiated by Kenya Railway in connection to the ongoing project for the rehabilitation of the Longonot- Malaba MGR Line.	
3.Introductions	A brief introduction was done between KR team and the participants.	
4.Project Description	Naftal Moibi gave an explanation for the public participation process as a requirement by EMCA 1999 and that Public participation is concerned with involving, informing and consulting the public in planning, management and other decision making activities. He reiterated that Public participation ensures that due consideration is given to public values, concerns and preferences when decisions are	

	made. He went on ahead to give the project description stating the scope of works and then highlighting the major project activities. The works to be undertaken include but not limited to: **Works** a. Ballast Screening b. Ballasting c. Adjustment of track curves d. Replacing of all rotten timber sleepers e. Renovation of turnouts f. Level crossing overhauls g. Bridges-Viaducts will be repaired and strengthened h. Station areas will be fenced off for safety and security i. Painting and renovation for all station buildings j. Water reconnection and sanitation facilities k. Asbestos removal	
5.Environmental and Social Impacts	He also presented the possible environmental impacts likely to occur and the ways in which the corporation/ contractor was planning to mitigate those impacts. **Operations Benefits** a. Employment Opportunities b. Seamless movement of cargo c. Decrease in GHG emissions d. Reduced road traffic congestion e. Reduced cost of transportation of goods and Passengers. f. Reduced road maintenance costs g. Increased National Economic status h. Reduction of road accidents caused by HCVs **Negative effects** a. Solid waste generation, b. Increased electricity, diesel, water consumption c. Accidental Spillages, Dangerous goods	-Provision of waste segregation Bins and dispose as per the waste Regulations -Energy management -Have a spill management plan

	Social Negative Impacts a. HIV /AIDs and Sexually Transmitted Diseases b. Early teenage pregnancies c. Insecurity d. Drugs and Substance abuse	-Community sensitization, campaigns and programmes
6.Questions	**Questions**	
	Mr. James Kariuki, *Chairman nyumba kumi:-* Why are all jobs being given to foreigners when there are jobless youths in Gilgil Town.	- Contractor shall be requested to give priority for employment of the locals for unskilled tasks.
	Mr. Moses Karanja:- what will be done to improve safety at the level crossings in Gilgil since the barriers that were initially there have since been vandalised. He was concerned that the number of vehicles and motor bikes has increased over the recent past.	-For safety reasons the barriers and level crossing signages will be replaced during this rehabilitation exercise.
	Grace Wambui:- Do we have the police patrolling at night to guard against theft of scrap metal?	-The station is manned by Railway Police and private security guards.
	Nancy:- requested that for unskilled labourers we employ local youth.	-Contractor shall be compelled to give priority for employment of the locals for unskilled tasks.
	One member suggested and recommended that in order to promote ownership the corporation utilises locals, when foreigners are engaged it promotes demonstrations.	
	Fencing will also close out the routes and control on trespassers hence reducing pedestrian accidents.	
	She requested to know what CSR activity can be done for Gilgil so that they all benefit from the project.	- The community can write a formal request for an agreed project that they need through the Chief's office to KR for consideration. KR to review and discuss with the community the request.
	One member wanted to know why we still require the diamond yet we can employ someone to manage the barriers at level crossings. He complained that the diamond was encroaching into his land.	-The diamond is legally Railway land and will be protected as such. He was advised to fill the boundary verification forms through which he will be shown his rightful boundary by the KR surveyors.

7.A.O.B	When we reopen the stations, the local leaders requested that station canteens, shops be let out to the locals. There being no other business the meeting was closed at 10:10hrs with a word of prayer from a volunteer.	

Minutes of the Public Consultation Meeting Held at Gilgil Railway Station on 27th August 2021 for Rehabilitation Project of Longonot-Malaba MGR Line.

Venue: Nakuru (Railways Locoshed Grounds)

Agenda

1. Opening prayer
2. Welcoming Remarks
3. Introductions
4. Project description
5. Social /Environmental Impacts
6. Questions and Answers session

MIN	ITEM	ACTION/REMARKS
	The meeting was held at Railway Locoshed Grounds Chief's office comprising of the representatives of community members representing the wider Nakuru Town area.	
	The community representatives present adhered to COVID-19 strict protocols/ containment measures including wearing mask, observing social distance and sanitizing.	-COVID-19 Protocols
1.Opening Prayer	The meeting was called to order by the area Chief Mr Joel Atuti, who invited the pastor to lead in a word of prayer at 11:40 am.	
2.Welcoming Remarks	The area Chief welcomed all members present to the meeting. The chief gave his opening remarks and informed those present that the meeting had been initiated by Kenya Railway in connection to the ongoing project for the Rehabilitation Project of Nakuru-Kisumu, Kisumu-Butere and Gilgil – Nyahururu MGR Rehabilitation Projects	
3.Introductions	The area Chief then invited the Yard Master, Mary, to chair the meeting. Mary thanked those in attendance for attending the meeting; she said she was glad with the outcome since all sectors had been well represented.	
	The Yard master invited all those present to introduce themselves.	
	A brief introduction was done between KR	

4.Project Description	team and the participants. Pauline Kiarie explained the purpose of the meeting and the requirement that as stakeholders they have a say in the project. She also reminded the participants that due to the COVID-19 pandemic, the meeting will be brief reminding all present to keep their masks on throughout the meeting. She then invited Naftal Moibi to give the project details and the reasons for the conducting public participation in the ESIA process Naftal Moibi gave an explanation for the public participation process as a requirement by EMCA 1999 and that Public participation is concerned with involving, informing and consulting the public in planning, management and other decision making activities. He reiterated that Public participation ensures that due consideration is given to public values, concerns and preferences when decisions are made. He went on ahead to give the project description stating the scope of works and then highlighting the major project activities. The works to be undertaken include but not limited to: **Works** a. Ballast Screening b. Ballasting c. Adjustment of track curves d. Replacing of all rotten timber sleepers e. Renovation of turnouts f. Level crossing overhauls g. Bridges-Viaducts will be repaired and strengthened h. Station areas will be fenced off for safety and security i. Painting and renovation for all station buildings j. Water reconnection and sanitation facilities k. Asbestos removal	
5.Environmental and Social Impacts	He also presented the possible environmental impacts likely to occur and the ways in which the corporation/ contractor was planning to	

	mitigate those impacts. **Operations Benefits** a. Employment Opportunities b. Seamless movement of cargo c. Decrease in GHG emissions d. Reduced road traffic congestion e. Reduced cost of transportation of goods and Passengers. f. Reduced road maintenance costs g. Increased National Economic status h. Reduction of road accidents caused by HCVs **Negative effects** a. Solid waste generation, b. Increased electricity, diesel, water consumption c. Accidental Spillages, Dangerous goods **Social Negative Impacts** a. HIV /AIDs and Sexually Transmitted Diseases b. Early teenage pregnancies c. Insecurity d. Drugs and Substance abuse	-Provision of waste segregation Bins and dispose as per the waste Regulations -Energy management -Have a spill management plan -Community sensitization, campaigns and programmes
6.Questions	**Questions** Maurice;- How will renovation of the residential houses be done. Are we going to move out or they will be renovated while we are still in? Chief Atuti, How can the sewerage system be improved to contain the current high volumes due to the population growth? Karen Achieng;- how can the residents benefit from employment opportunities arising during and after the project period. Will the gates be erected to improve security?	-Notices shall be issued before renovation of the residential houses commence -For safety reasons the houses have to be vacant for renovation to be undertaken -KR to liaise with NAWASCO and engage them to overhaul the current sewerage system -Contractor shall be compelled to give priority for employment of the locals for unskilled tasks. -Once fencing is complete, gates shall be erected -Risk Assessment to be done

7.A.O.B	The railway yard is very dark at night, can flood lights be installed?	to ascertain the number and position of floodlights needed
	Dickson was happy with the renovation, and return of train services, he wanted to know if those who have rented will be given priority after renovations.	-No one shall be evicted from the houses if they have a valid agreement with KR
	Corporate Social Responsibility The community members requested that during project construction, the contractor can be requested to put up for them a security office. They decried that since the matatu terminus was moved from town, the railways yard had been subjected to security threats.	-The community to write a letter addressed to KR's MD inform of a proposal to have the security office near the matatu terminus.
	Chief Atuti requested for seedlings for the KR yard, most trees were old and pose a threat during heavy rainfall hence need to be cut.	-KR to organise for new young tree seedlings
	The Health officer in attendance was given an opportunity to sensitize the public on COVID-19.	-COVID-19 Containment Measures
	He reminded members of the public to go for vaccination as this will give them a better fighting chance should they be infected by the virus. He encouraged all to continue observing all the Ministry of Health guidelines even after vaccination.	-Members of the public to be vaccinated
	There being no other business the meeting was closed at 13:15hrs with a word of prayer.	

7. A.O.B

Minutes of the Public Consultation Meeting Held at Eldoret Railway Station on 29th August 2021 for the Rehabilitation Project of Longonot- Malaba MGR Line.

Venue: Eldoret Railway Station (Training Room)

Agenda

1. Opening prayer
2. Welcoming Remarks
3. Introductions
4. Project description
5. Social /Environmental Impacts

MIN	ITEM	ACTION/REMARKS
	The meeting was held at Eldoret Railway Station Training Room comprised of the representatives of community members representing the wider Eldoret Township area.	
	The community representatives present adhered to COVID-19 strict protocols/ containment measures including wearing mask, observing social distance and sanitizing.	-COVID-19 Protocols
1.Opening Prayer	The meeting was called to order and started with a word of prayer from a volunteer at 15:00hrs.	
2.Welcoming Remarks	A brief introduction was done between KR team and the participants present for the meeting.	
3.Introductions		
4.Project Description	Naftal Moibi gave an explanation for the public participation process as a requirement by EMCA 1999 and that Public participation is concerned with involving, informing and consulting the public in planning, management and other decision making activities. He reiterated that Public participation ensures that due consideration is given to public values, concerns and preferences when decisions are made.	
	He went on ahead to state the project description and the scope of works by highlighting the major project activities, works to be undertaken include but not limited to:	
	Works	

	a. Ballast Screening b. Ballasting c. Adjustment of track curves d. Replacing of all rotten timber sleepers e. Opening Drainages f. Repair of collapsed culverts g. Renovation of turnouts h. Level crossing overhauls i. Bridges-Viaducts will be repaired and strengthened j. Station areas will be fenced off for safety and security k. Painting and renovation for all station buildings l. Water reconnection and sanitation facilities m. Asbestos removal	
5.Environmental and Social Impacts	He also presented the possible environmental impacts likely to occur and the ways in which the corporation/ contractor was planning to mitigate those impacts. **Operations Benefits** a. Employment Opportunities b. Seamless movement of cargo c. Decrease in GHG emissions d. Reduced road traffic congestion e. Reduced cost of transportation of goods and Passengers. f. Reduced road maintenance costs g. Increased National Economic status h. Reduction of road accidents caused by HCVs **Negative effects** a. Solid waste generation, b. Increased electricity, diesel, water consumption c. Accidental Spillages, Dangerous goods **Social Negative Impacts** a. HIV /AIDs and Sexually Transmitted Diseases b. Early teenage pregnancies c. Insecurity d. Drugs and Substance abuse	-Provision of waste segregation Bins and dispose as per the waste Regulations -Energy management -Have a spill management plan -Community sensitization, campaigns and programmes
6.Questions	**Questions and Answer session** **Tobias Owino;-** He noted that as a village	

	elder he is very supportive of the project. It will boost businesses and ease transport costs.	-Appreciation Comment
	Rose Maiyo:- Are you going to move evict those people whose houses that shall be fenced inside your station area?	-For tenants that have agreements with KR, Railway will give notice and adhere to the agreement. KR gave eviction notices to all owners of properties within KR land.
	How are you going to allow small businesses back within KR once you fence and properly demarcate your property?	- No business or persons will be allowed to construct or erect any structures within the railway corridor/ station premises. Additionally, no further cultivation will be allowed within KR reserve.
	Amos, He noted that he is in support of the proposed project and that it will be beneficial.	-Appreciation Comment
	On the issue of boundary demarcation he noted that the boundaries are known by the locals and that if anyone is in dispute, he/she should liaise with KR.	-Anyone with a boundary dispute to fill a boundary verification form and pay the required fee.
	Shadrack;- how shall we as the area residents benefit from the project?.	-The contractor shall be requested to employ and give priority to local community members for both skilled and unskilled labour.
	He asked that locals to be considered for employment opportunities arising during and after the project period.	
7.A.O.B	The area A.Chief Kemei Sitienei parents with school going children to take them to school as per the government's directive of100% transition from primary to secondary school.	-100% school transition
	He warned those crooks in railway land who are involved in the illicit business of brewing (Changaa) that the law will catch up with them.	-Illicit brew warning notice
	He cautioned those railway tenants who area subletting the houses to unknown people to stop doing so.	-Subletting of Railways Residential houses.
	There being no other business the meeting was closed at 16:10hrs with a word of prayer by Lucy Kemunto.	

Minutes of the Public Consultation Meeting Held at Railways Locoshed Grounds on 31st August 2021 for the Rehabilitation Project of Longonot- Malaba MGR Line.

Venue: Bungoma Railway Station

Agenda

1. Opening prayer
2. Welcoming Remarks
3. Introductions
4. Project description
5. Social /Environmental Impacts
6. Questions and Answers session

MIN	ITEM	ACTION/REMARKS
	The meeting was held at Bungoma Railway Station comprising of the representatives of community members representing the wider Bungoma Town area.	
	The community representatives present adhered to COVID-19 strict protocols/ containment measures including wearing mask, observing social distance and sanitizing.	-COVID-19 Protocols
1.Opening Prayer	The meeting was called to order by the Permanent Way Inspector Mr. Julius Owino, who invited the local pastor Samuel Okaron to lead in a word of prayer at 14:30 hrs.	
2.Welcoming Remarks	The PWI welcomed all members present to the meeting. He then invited the area chief to give his opening remarks and informed those present that the meeting had been initiated by Kenya Railway in connection to the ongoing project for the rehabilitation of the Longonot-Malaba MGR Line.	
3.Introductions	A brief introduction was done between KR team and the participants.	
	The area Chief Mr. Joseph Chengoli gave a brief history on the railway down the memory lane in 1969 and his excitement towards the rehabilitation project.	
	To him this was an answered prayer as he said his desire was to see the Railway operate with passenger services as it was in the past when	

	he was a young man back in 1969.	
4.Project Description	He requested to have the steam engine at Nairobi Museum to be brought to Bungoma so that the young people can see and enjoy what trains were being used back in the days. He then handed over the platform to KR to continue with the day's agenda. Mr. Naftal Moibi gave an explanation for the public participation process as a requirement by EMCA 1999 and that Public participation is concerned with involving, informing and consulting the public in planning, management and other decision making activities. He reiterated that Public participation ensures that due consideration is given to public values, concerns and preferences when decisions are made. He went on ahead to give the project description stating the scope of works and then highlighting the major project activities. The works to be undertaken include but not limited to: **Works** a. Ballast Screening b. Ballasting c. Adjustment of track curves d. Replacing of all rotten timber sleepers e. Renovation of turnouts f. Level crossing overhauls g. Bridges-Viaducts will be repaired and strengthened h. Station areas will be fenced off for safety and security i. Painting and renovation for all station buildings j. Water reconnection and sanitation facilities k. Asbestos removal	
5.Environmental and Social Impacts	He also presented the possible environmental impacts likely to occur and the ways in which the corporation/ contractor was planning to mitigate those impacts. **Operations Benefits** a. Employment Opportunities	

	b. Seamless movement of cargo c. Decrease in GHG emissions d. Reduced road traffic congestion e. Reduced cost of transportation of goods and Passengers. f. Reduced road maintenance costs g. Increased National Economic status h. Reduction of road accidents caused by HCVs	
	Negative effects a. Solid waste generation,	-Provision of waste segregation Bins and dispose as per the waste Regulations
	b. Increased electricity, diesel, water consumption	-Energy management
	c. Accidental Spillages, Dangerous goods	-Have a spill management plan
	Social Negative Impacts a. HIV /AIDs and Sexually Transmitted Diseases b. Early teenage pregnancies c. Insecurity d. Drugs and Substance abuse	-Community sensitization, campaigns and programmes
6.Questions	**Questions**	
	One resident was concerned that the number of people attending the meeting was very small compared to the population of the town. He wanted to know if the corporation will use other forums like Media channels to spread the project information so that many people are aware.	-Due to COVID-19 restrictions the organisers of the meeting had to select target community groups and invite their representatives who will in turn give their members feedback from the meetings. -The ESIA study report shall be advertised through the print and audio media for more comments from the public
	He also wanted to know if the fencing of stations was being done unilaterally by KR or if the neighbours are being involved.	- KR already gave eviction notices to all owners of properties within KR land. -He was advised to fill the boundary verification forms through which he will be shown his rightful boundary by the KR surveyors.

	Was MGR going to be used for transportation of goods only or even passengers? One lady said the Bungoma people would like for passengers to be considered too as the demand was very high.	- KR to review the request and consider introducing passenger service also.
	The assistant Chief Ms Mabele commented on the negative impacts of the project as spread of STIs, cultural distortion, she requested sensitization of neighbouring communities on HIV and AIDS.	-Comment by Assistant Chief.
	On the positive side she highlighted the possibility of improvement in technology as a positive outcome that could result from the project.	
7.A.O.B	The chief suggested that since Bungoma is currently suffering from the street children menace, that KR considers sponsoring even 50 children for TVET training.	- The community can write a formal request through the Chief's office to KR for consideration. KR to review and discuss with the community the request.
	There being no other business the meeting was closed at 16:00hrs with a word of prayer by pastor Samuel Okaron.	

Minutes of the Public Consultation Meeting Held at Malaba Railway Station Boardroom on 1st September 2021 for Rehabilitation Project of Longonot- Malaba MGR Line.

Venue: Malaba Railway Station (Boardroom)

Agenda

1. Opening prayer
2. Welcoming Remarks
3. Introductions
4. Project description
5. Social /Environmental Impacts
6. Questions and Answers session

MIN	ITEM	ACTION/REMARKS
	The meeting was held at Malaba Railway Station (Boardroom) comprised of the representatives of community members representing the wider Malaba BoarderTown.	
	The community representatives present adhered to COVID-19 strict protocols/ containment measures including wearing mask, observing social distance and sanitizing.	-COVID-19 Protocols
1.Opening Prayer	The meeting was called to order by the area Chief Mr.Nimrod Okapesi, who invited the local church pastor Francis Akusai to lead in a word of prayer at 10:00 am.	
2.Welcoming Remarks	The area Chief Nimrod Okapesi welcomed all members present to the meeting.	
	The area Chief then invited the Yard Master, Kneller Agong, to chair the meeting.	
3.Introductions	The Yard master invited all those present to introduce themselves.	
	He then invited Naftal Moibi to give the project details and the reasons for the conducting public participation in the ESIA process	
4.Project Description	Naftal Moibi gave an explanation for the public participation process as a requirement by EMCA 1999 and that Public participation is concerned with involving, informing and consulting the public in planning, management and other decision making activities. He reiterated that Public participation ensures that	

	due consideration is given to public values, concerns and preferences when decisions are made. He went on ahead to give the project description stating the scope of works to be undertaken in the rehabilitation project noting that the project runs along the 465Km of the MGR line and that it traverses six counties namely;- Nakuru, Baringo,Kakamega, Uasin Gishu, Bungoma and Busia. The works to be undertaken include but not limited to: **Works** a. Ballast Screening b. Ballasting c. Adjustment of track curves d. Replacing of all rotten timber sleepers e. Renovation of turnouts f. Level crossing overhauls g. Bridges-Viaducts will be repaired and strengthened h. Opening Drainages i. Repair of Collapsed culverts j. Station areas will be fenced off for safety and security k. Painting and renovation for all station buildings l. Water reconnection and sanitation facilities m. Asbestos removal	
5.Environmental and Social Impacts	He also presented the possible environmental impacts likely to occur and the ways in which the corporation/ contractor was planning to mitigate those impacts. **Operations Benefits** a. Employment Opportunities b. Seamless movement of cargo c. Decrease in GHG emissions d. Reduced road traffic congestion e. Reduced cost of transportation of goods and Passengers. f. Reduced road maintenance costs g. Increased National Economic status h. Reduction of road accidents caused by HCVs	

	Negative effects a. Solid waste generation,	-Provision of waste segregation Bins and dispose as per the waste Regulations
	b. Increased electricity, diesel, water consumption	-Energy management
	c. Accidental Spillages, Dangerous goods	-Have a spill management plan
	Social Negative Impacts a. HIV /AIDs and Sexually Transmitted Diseases b. Early teenage pregnancies c. Insecurity d. Drugs and Substance abuse	-Community sensitization, campaigns and programmes
6.Questions	**Questions and Answer Session**	
	Mr Otinya- Clearing Agent;- He was very grateful and supportive for the project.	-Appreciation Comment
	Has KR factored in the need for having a yard for container storage, loading and offloading at Malaba?	-Plans are in place to construct a yard at Malaba to cater for transit containers.
	He requested the contractor to involve locals for employment opportunities both skilled and unskilled.	-The contractor shall be requested to employ and give priority to local community members for both skilled and unskilled labour.
	Mr Francis:- My land was recently surveyed for a railway project, we need to be compensated first before the project starts?	-If the land was surveyed for acquisition purposes then the acquisition process has to be followed.
	Mr Olinya:- He complained of frequent trespassing arrests at Malaba yard because there is no alternative route to access their houses. He requested for an overpass footbridge to be constructed across the yard for security and safety reasons.	- The community can write a formal request for an overpass through the Chief's office to KR for consideration. KR to review and discuss with the community the request.
	He added that the village has not benefitted from any employment opportunities and asked what they can do in order for them to get skilled or unskilled employment with KR.	-The contractor shall be requested to employ and give priority to local community members for both skilled and unskilled labour. -The community members can now enrol their family members for railway related courses at any of the Railway

		Training Institutes i.e. Marine Training Institute in Kisumu or Railway Training Institute in Nairobi. One will stand a better chance for employment when vacant positions are advertised.
	One member also requested for a yard/port to be constructed on the Kenyan side to avoid taking/ transferring all jobs to Uganda.	-Plans are in place to construct a yard at Malaba to cater for transit containers.
7.A.O.B	The Administration police commander in attendance also had a security message for the residents by cautioning them not to allow their daughters not to seek for employment at Moding shoping center. He noted that there is a gang tricking young girls by luring them that they can employ them to be shop attendants, but when they appear there for the job they are abducted, raped and killed.	-Security Alert Message
	There being no other business the meeting was closed at 11:10hrs with a word of prayer by Pastor Francis Akusai.	

LONGONOT

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 24/08/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT LONGONOT HELD AT CHIEFS OFFICE LONGONOT

S/No.	Name	Organization	Email address	Phone number	Signature
1.	VERONICA NDUTA	ELDER		0724026290	
2.	HANNAH NYAMBURA	ELDER		0727340466	
3.	TIMOTHY NJOKU WANJAMA	YOUTH	kamburwanjama@gmail.com	0717003721	
4.	Elizabeth Wambu	PWP		0729935595	
5.	James Mbugua	Elder		0727644622	
6.	William Nguthi	ELDER	0731126454		
7.	Susan Emitundo	KRC	semitundo@krc.co.ke	0722286912	
8.			SO		

LONGONOT

ATTENDANCE REGISTER

DATE: 24/08/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT LONGONOT HELD AT CHIEF'S OFFICE LONGONOT

S/No.	Name	Designation	Email address	Phone number	Signature
1.	Pauline Kiarie	AEM - KRC	pkiarie@krc.co.ke		[signature]
2.	Naftali Moiki	- KRC	nmirugwa2@gmail.com		[signature]
3.	Susan Emitundo	- KRC	semitundo @ krc.co.ke		[signature]
4.	STEPHEN K. NJUGUNA	CHIEF(JGL)	stevenjuguna1234@gmail		[signature]
5.	MARY . N. NJUGI	ASS. CHIEF(JGJ)	maryjugi8@gmail		[signature]
6.	JOHN NJOROGE K	OPION LEADER		0724673351	[signature]
7.	Kibunja Kamau K.	Opinion leader		0726-344474	[signature]
8.	Francis Muniu Njoroge	Elder	F.muniu@gmail.com	0728942782	[signature]

LONGONOT

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 24/08/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT HELD AT CHIEFS OFFICE LONGONOT

S/No.	Name	Designation	Email address Phone number	Signature
9.	MILLICENT KAIMURI	OPINION ELDER	0721150606	
10.	FRANCIS KIBE	LONGONOT DISPEN SARY	francis.kibe35@gmail.com 0724249118	
11.	James N. Kago	Longonot Dispensary Committee member	Jamesngubi7@gmail.com	
12.	Rev Peter Kariuki	Pastor	0719836219	
13.	Willy Mwangi		Willcam.gitau@gmail.com 0715413716	
14.	Raphael Kario	Longonot committee	0724050905	
15.	Joseph Mwema	Longonot comm	0721675012	
16.	MIRIAM WANGARI	LONGONOT ELDER COUNCIL	0724971546	
17.	[illegible]	POLITICAL LEADER	0724870136	

GILGIL

ATTENDANCE REGISTER

DATE: 25/8/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT GILGIL HELD AT GILGIL RAILWAY STATION

S/No.	Name	Organization	Email address	Phone number	Signature
1.	Pauline Kuarie	Krc - AGM	pkuarie@krc.co.ke	0721970163	[signature]
2.	~~Naftal Mwiti~~	~~KRC - AGM~~			
3.	Susan Emitundo	KRC - AGM	semitundo@krc.co.ke	0722286912	[signature]
4.	HAFTAL M. MWIBI	KRC	Thinegwa[illegible]@gmail.com		[signature]
5.	JOHN K THUKU	CHIEF			[signature]
6.	JOSEPH . N . MWAURA	ASS/CHIEF	Josephmwaura@gmail.com		[signature]
7.	BONIFACE . M . MBAGE	ASS/CHIEF	Mbagebon@gmail.com	0723514344	[signature]
8.	ANN NJOROGE	ASST Chief	awamartha@gmail.com	0712984454	[signature]

GILGIL

ATTENDANCE REGISTER

DATE: 25/8/2021

SUBJECT:

S/No.	Name	Organization	Email address	Phone number	Signature
9.	Nancy Mwenja	Teacher	nancymwenjat5@gmail.com	0722927617	[signature]
10.	Grace Ndiritu	Nyumba Kumi	grace.wambui@555@gmail.com	0799006866	[signature]
11.	Pst. Muiruri	Deliverance church	pastormuiruri@yahoo.com		Muiruri
12.	JAMES KARIUKI	Chair Nyumba Kumi gilgil		NO 0725719096	[signature]
13.	purity Karanja	Nyumba Kumi / CPC	puritykaranja960@gmail.com	0722645462	[signature]
14.	MOSES KARANJA	Nyumba Kumi CPC Secretary	N/A	0720731252	[signature]
15.	MARGARET WAMBUI	Chief's Secretary	[illegible]	[illegible]	[signature]
16.	NICHOLAS N. NWAURA	Citizen		0715239[illegible]	[signature]
17.					

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 25/8/2021

SUBJECT:

S/No.	Name	Organization	Email address	Phone number	Signature
18.	Doreas Wanjiku	Nyumba Kumi		0724479457	
19.	JULIAN WAMUCHE			0726898611	
20.	EDWARD THIONGO			0714569595	
21.	MARY KIAHU	Residence	Marsambogge2018@gmail.com	0793901363	
22.	Josphine Mbayu	RESIDENCE		0110092764	
23.	Monica Wacheke	Teacher		0720693543	
24.					

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 27/8/2021

SUBJECT: Public stakeholder engagement at Nakuru Railway Yard

S/No.	Name	Organization	Email address	Phone number	Signature
9.	Grace Wathera	Railways NKR		0706618649	
10.	CARREN KWAMBOKA	Railways (teacher)	CarrenB@gmail.com	0721549530	
11.	ELMGLDER MBAYI	Business lady	emeldaman498@gmail.com	0711142810	
12.	ROSE MBAYI	Business/Retail		0715217257	
13.	FAITH TUIT	Residence Nakuru	faybuit@gmail.com	0713630857	
14.	Mercy Jelagat	Residence Nakuru	JelagatMercy6@gmail.com	0742062255	
15.	EMILY OWINO	Residence		0723327620	
16.	ELIZABETH NALIAKA	Residence NKR		0706586389	
17.	ESTHER AMBALO	Residence NKR	estherambalo@gmail.com	0724774586	

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 27/8/2021

SUBJECT: Public stakeholder engagement at Nakuru Railway Yard

S/No.	Name	Organization	Email address	Phone number	Signature
18.	CAREN ACHIENG DUDA	HAKURU RAILWAYS RESIDENT	Dudacaren@gmail.com	0722275118	
19.	Faith Ngatia Wanja	NAKURU RAILWAYS Resident	Ngatiafai@gmail.com	0700504223	
20.	ESTHER NJERI	NAKURU Railways resident		0725796353	
21.	JULIUS L. JAIKA	RETIRED KR EMPLOYEE	jaikaji@gmail.com.	0725478086	
22.	DICKSON AMARIATI	NAKURU RAILWAYS		0718436659	
23.	ZAKARIA MWANGI	SOCIAL WORKER	Njuguna-Zakaria1992@gmail.com	0729973616	
24.					

BUNGOMA

ATTENDANCE REGISTER

DATE: 31/8/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT BUNGOMA RAILWAY STATION

S/No.	Name	Organization	Email address	Phone number	Signature
1.	Pauline Kuria	KRC-AGM	pkuria@krc.co.ke	0721990163	[illegible]
2.	HAFITAL M. MWOBI	KRC-EC	Tmiregwa@@gmail.com	0722461050	[illegible]
3.	Susan Emibundo	KRC-CLO	semibundo@krc.co.ke	0722286912	[illegible]
4.	JULIUS V. OHINO	KRC	auko.jv@yahoo.com	0725604567	[illegible]
5.	SAMUEL. E. OKHIRONI	Bussiness man	Samokeni.org	0729394828	[illegible]
6.	PRISCILLAH H. Wetungu	Elder Sihoko B Mukasa		0740109456	[illegible]
7.	DOREEN NAFUNA WASILWA	VILLAGE ELDER SIHOKO A		0741230566	D. [illegible]
8.	TISO JUMA WAMALWA	VILLAGE ELDER MUKABO		0768348204	[illegible]

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 31/8/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT BUNGOMA HELD AT BUNGOMA RAILWAY STATION

S/No.	Name	Organization	Email address	Phone number	Signature
9.	JAMILA SAID	TOWN SHIP S.V. ELDER		0721170641	Jamila S.
10	CRISPINE B. WOMALIA	DUMP SITE LUMORO		0700124831	C.B.Womalia
11.	IRINE FELIX	CHURCH-ELDER		0712950664	Irine.
12.	BERINA WACHIRA	BUSINESS		0703833981	
13.	DENNIS M. KHAEMBA	BODA BODA RIDER	Masikadi@gmail.com	0717196297	Denis.
14	JOSPHAT W. WANYAMA	SHARIFFS CENTRE LTD	Shariffscentre@gmail.com	0733647786 0717393068	
15	KENNEDY WERE	POLICE DEPARTMENT	WereKennedy@gmail.com	0723661245	
16	ROSELINE OYOLA	BUSINESS	roseline adhis oyola@gmail.com	0709242093	

Bungoma W

ATTENDANCE REGISTER

DATE: 31/8/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT BUNGOMA HELD AT BUNGOMA RAILWAY STATION

S/No.	Name	Organization	Email address	Phone number	Signature
17	IMMACULATE AKINYI	NAMACHANJA MANAGER	yasjasmin218@gmail.com	0721120552	
18.	Joseph Changoli	SNR JOB OFFICER 2	Kengejatonet@gmail.com		
19.	TECLAH MAKOKHA	Business	Jesse clide@gmail.com	0716611368	
20.	CHRISTINE MABELE	SNR A/CHIEF Job 2	ChristineMabele2@gmail.com	0707989683	
21.	Evelyne M. Wanyonyi	Mukabo Village elder		0723775324	
22.	Rosemary Adhiambo	Mandizini Village elder		0715839769	
23.	PETER KURU	Church Member		0721832438	
24.	ESTER OMBAYO	BUSINESS RAIL CANTEEN		0726389529	

Eldoret

ATTENDANCE REGISTER

DATE: 29/8/2021

SUBJECT: Eldoret
PUBLIC STAKEHOLDER ENGAGEMENT AT ELDORET

S/No.	Name	Organization	Email address	Phone number	Signature
1.	Pauline Kiarie	KRC - AGM	pkiarie@krc.co.ke	0721970163	[signature]
2	~~Naftali Mbobi~~	~~KRC - EC~~			
3	Susan Emitundo	KRC - CLO	semitundo@krc.co.ke	0722286912	[signature]
4	Shadrack Riema	Resident Railways	Riemashadrack@gmail.com	0723364283	[signature]
5	MAXWELL KIMUTAI	RESIDENT-RAILWAYS	Kimutaimaxfarmer@gmail.com	0700426338	[signature]
6	ROSE MAIYO	MAMA MITAA	ROSEMAIYO@gmail.com	0728474844	[signature]
7	ALI A. MOHAMED	RESIDENT RAILWAYS	ALI BAYA. MOHAMED.COM	0700416890	[signature]
8	CHUKULAM. DAUDI	RESIDENT Railways		0759136444	
9	MAEL ILAINO	RESIDENT RAIL		0704968081	

Eldoret

ATTENDANCE REGISTER

DATE: 29/8/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT ~~LONGONOT~~ ELDORET HELD AT ELDORET RAILWAY STATION

S/No.	Name	Organization	Email address Phone number	Signature
19.	DAVID OUKO GWAKO	Resident	Gwakdavid@yahoo.com 0711845300	
20.	ISAAC KIPKOSGEI KIBET	Resident	0799593190	
21.	NICHOLAS MUTAI	RESIDENT	nicholasclerinyot978@gmail.com 0727988219	
22.	BASILIZA JEPKURGAT	Resident	BASILIZA JEPKURGAT 0729216394	
23.	TOBIAS OMUNO	VILLAGE ELDER	TobiasOmuno730@gmail.com 0713697469	
23.	FAITH KIBET	RESIDENT	FAITHCKIBET@GMAIL.COM 0743707119	
24.	LUCY ILEMUKITO	RESIDENT	0714731175	

Eldoret

ATTENDANCE REGISTER

DATE: 29|8|2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT ELDORET

S/No.	Name	Organization	Email address	Phone number	Signature
24	Kemei Cleres	M Chief (J-Gp H)	kipkegeicheres@gmail.com		[signature]
25	Hafial M. Mwobi	KPC – EC	Tmiegwa2@gmail.com		[signature]
26	Agnes Muthoni	Revedence ~~KPC – EC~~		0717272882	AO
27	MEDINA JEPKEMBOI	Resident		0726496093	[signature]
5.					
6.					
7.					
8.					

Eldoret

ATTENDANCE REGISTER

DATE: 29/8/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT ELDORET

S/No.	Name	Organization	Email address	Phone number	Signature
10	Josephat Orom	Railways Residence	Oudgiorm@gmail.com		[signature]
11.	IRINE JELAGAT	Tracos Cleaning Railways service	Jelaairine@gmail.com		[signature]
12	EVANS OJUMA	Tracos Cleaning service	Ojevans.gmail.com		[signature]
13	SOPHIA JEMUTAI	Railway Resident	jemusophie3@gmail.com		[signature]
14	MOSES BOKHUNGU	Youth organized	Mosesbokhungu@gmail.com	0111330774	[signature]
15	RUTH SAIGE	Youth organizer	Ruth	0727819310	[signature]
16	JAEL JEMUTAI	Railway Resident	JAEL	0741856400	[signature]
17	TABITHA CHEROP	Railway Resident	MARK	0713917818	[signature]
18	Sheila mabwe	RAILWAY RESIDENT	mabwesheila@.com	0729527558	[signature]

Malaba

(1)

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 1/9/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT MALABA BORDEMA RAILWAY STATION

S/No.	Name	Organization	Email address Phone number	Signature
1.	Pauline Kuria	KRC - AGM	pkuria@krc.co.ke 0721970163	
2.	HAFITHA M. MOIBI	KRC - EC	hmoiregwa@gmail.com.	
3.	Susan Emitundo	KRC - CLO	semitundo@krc.co.ke	
4.	PETER OKOJ.	NEIGHBOUR	0707787717	
5.	BONIFACE OMANYALA	NEIGHBOR	0746297398	
6.	DUNCAN ISANJU	Village Elder	0728431807	
7.	RASHID OSAMONG OLINGA	MATATU TRANSPORT CHAIRMAN	0713328503	
8.	JUMA CHRISTOPHER	SCHOOL.	0740693766	

ATTENDANCE REGISTER

DATE: 1/9/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT MALABA RAILWAY STATION

S/No.	Name	Organization	Email address Phone number	Signature
9.	GEORGE-O- OMALA	CHAIRMAN NYUMBA KUMI OWABAI	0721 353058	
10.	GABRIEL WANGA	KRC	0715387873	
11.	ESAKU PAUL	UNC	paulesaku20@gmail.com 0754432230	
12.	John BOSCO NDUNG	Elder ELOBAI	0720644650	
13.	DENIS ETAIT	Resident	0742908993	
14.	Otta Deo	Clearing & fon	0724 998383	
15.	Knellen Osano	KRC	0726506121	
16.	Bernard -B. Imaet	Resident	0740402631	
17.	REUBEN K. ILOEAH	KRC	0725735495	

Malaba

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 1/9/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT ~~BUNGOMA~~ MALABA RAILWAY STATION

S/No.	Name	Organization	Email address	Phone number	Signature
9.	JAMES NJOROGE	LONG DISTANCE DRIVER K.L.D.T.D.N	njorojames64@gmail	0726-693516	[signature]
10.	FRANCIS OPURU	NEIBAYBARY		0711451647	[signature]
11.	TITUS OKWARE	JIRANI		079681513	[signature]
12.	QUINTO ETYANG	TESO DRIVER SACCO Chairman TDSA		0724533298	[signature]
13.	ABEL OPIKI	Business JIRANI		0714822516	[signature]
14.	LABAN WANYONYI	D/OCPP MALABA R/POLICE		0726502975.	[signature]
15.	Lenard wechuli	Mpangoji matatu stage		0707039495	[signature]
16.	SOLOMON ONGILI	RIPE FREIGHT LTD		0723632956	[signature]
17.	FRANCIS OKISA	Chuna cha	francisokisa@gmail	0717125192	[signature]

KENYA RAILWAYS

ATTENDANCE REGISTER

DATE: 1/9/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT MALABA RAILWAY STATION

S/No.	Name	Organization	Email address Phone number	Signature
18.	Christine Chutonga	Nairobi	0728537 69	
19.	SALOME OKWARA	ASST CHIEF-TOWN NGAO. JB'G	0724707248 Salomeokwara@gmail.com	Asst. chief
20.	GABRIEL OMOSING	Business man.	gabrielomosing@yahoo.com 0722168556	
21.	Akonya Sarah	URC	+256772907074 Sara.akonya@gmail.com	
22.	MUSA O. OLINGA	SNR CHIEF - AMONI JOB-1KI NGAO	musaolinga@gmail.com	Senior chief
23.	JOSEPHINE W'OMBURA	VILLAGE ELDER NGAO/OLOBAI	0720-224253	
24.	TEBERERIUS KARAKACHA	SENIOUR ASST/CHIEF NGAO/OLOBAI	0720-679753	

ATTENDANCE REGISTER

DATE: 1/9/2021

SUBJECT: PUBLIC STAKEHOLDER ENGAGEMENT AT MALABA RAILWAY STATION

S/No.	Name	Organization	Email address Phone number	Signature
18.	ASST. CHIEF NIMROD OKAPESI	TOWNSHIP - 'H' NGAO	0723812584	Ass't. Chief
19.	PETER MIYA	KRC	0729472033	
20.	JOHN OWADE	KRC	0725200703	
21.	ISAAC M. EMOJONG	NGAO	emojongisaac9@gmail.com 0714567798	Chief
22.				
23.				
24.				

Annex 3: Questionnaires

Annex 4: Copy of Approved Terms of Reference