

COUNTY GOVERNMENT OF KIAMBU



ENVIRONMENTAL IMPACT ASSESSMENT PROJECT REPORT FOR PROPOSED UPGRADING OF 1.5KM GITHUNGURI-GATTITU-GITHIGA ROAD TO BITUMINOUS STANDARDS



PROPONENT	SUBMITTED BY
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MARCH 2020

DECLARATION

This Environmental and Social Impact Assessment (ESIA) project Report for the Proposed Upgrading of 1.5km Githunguri-Gatitu-Githiga road to bituminous standards has been done by registered and licensed EIA /EA lead Expert and Associate Expert with reasonable skills, care and diligence in accordance with the Environmental Management and Co-ordination (Amendment) Act, 2015 and the Environmental Impact Assessment and Audit Regulations, 2003.

We the undersigned, confirm that the contents of this ESIA project report are correct to the best of our knowledge. This report is issued without prejudice.

Samuel Wakangu Kiarie EIA/EA Lead Expert Reg No. 6750 P.O Box 416-00217, Limuru Signature.....Date.....	Grace Wanjiru Mwangi EIA/EA Associate Expert Reg No. 8157 P.O. Box 247 - 00621, Village Market Signature.....Date.....
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PROPONENT

I,, On Behalf of the **COUNTY GOVERNMENT OF KIAMBU**, declare that all the information contained in this ESIA Project report is an accurate and truthful representation of all findings as relating to the proposed project.

Signed on this.....day of March 2020

Signature and stamp:

Designation: Chief Officer- Municipal Administration and Urban Development

LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BoQs	Bills of Quantities
CGK	County Government of Kiambu
CIDP	County Integrated Development Plan
CoK	Constitution of Kenya
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMP	Environmental Management Plan
KUSP	Kenya Urban Support Program
NEMA	National Environment Management Authority
NMT	Non Motorable Transport
OP	Operational Policy
PSV	Public Service Vehicles
TOR	Terms of Reference
WB	World Bank

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EXECUTIVE SUMMARY

Introduction

The World bank through Kenya Urban Support Program has funded County Government of Kiambu through the department of Land, Housing, Physical Planning, Municipal Administration and Urban Development. The funds will be used to upgrade 1.5KM of Githunguri- Gatitu - Githiga Road to Bituminous Standards(inclusive of foot path and drainage system). This project is intended to support the primary growth of businesses and improve transport network.

This project report was conducted in accordance to the requirements as stipulated in the Environmental Management and Co-ordination (Amendment) Act, 2015 and the Environmental Impact Assessment and Audit Regulations, 2003. The Study Process leading to this Project Report was further designed to address the proponent's expectations as stipulated in the Terms of References (TORs). The purpose of the study is to identify the negative and positive impacts that would be generated by the proposed project (during the construction, operational and decommissioning phase). Means to mitigate the identified negative impacts and enhance the positive ones are dwelt with as appropriately as possible.

Objectives of the Environmental and Social Impact Assessment (ESIA)

The main objective of the study was to identify environmental and social impacts related with the proposed upgrading of Githunguri- Gatitu - Githiga Road (1.5KM) to Bituminous Standards (inclusive of foot path and drainage system) and advice on an appropriate environmental management strategy. One of the major outcomes of this study is an Environmental Management Plan (EMP).

Study Approach and Methodology

This study was guided by the Legal Notice 101 of Environmental Management and Co-ordination Act (EMCA) 1999, Amendment of 2015. This exercise involved reviewing of project documentation and holding discussions with the proponent, this helped in generating the baseline data. The opinions formed were validated through field work that entailed physical investigation of the project site areas, interviews with potentially affected people and key informant, photography and discussions with secondary stakeholders. The following were various study methods and tools employed. These included questionnaires, observations, expert opinion and checklists. These assisted in the identification, prediction, analysis and evaluation of potential impacts that may emanate from the proposed project.

Policy, Legal and Regulatory Framework

The ESIA was carried out and a report prepared to ensure that the proposed Upgrading of 1.5km Githunguri-Gatitu-Githiga road to bituminous standards comply with Environmental Management and Co-ordination (Amendment) Act, 2015, Kenya's supreme environmental law and the National Constitution. It is also developed to ensure compliance with the national policy aspirations towards achieving sustainable development. On the other hand, Environmental Management and Co-ordination (Amendment) Act, 2015 and the Environmental Impact Assessment and Audit Regulations, 2003 (Second Schedule and Legal Notice 101), clearly indicate that any proposed development in Kenya should be subjected to ESIA. The entire Study process has been designed to conform to the regulatory framework stipulated by the National Environmental Management Authority (NEMA).

Description of the Project

The proposed site is located about 19.7 kilometers from Nairobi CBD and is in Ndumberi ward, Kiambu Sub-County, Kiambu Municipality in Kiambu County. The selected site is located on the Latitude: 1°8'52.55"S, Longitude: 36°48'27.18"E, to Latitude: 1°8'49.30"S, Longitude: 36°47'57.12"E on approximate elevation of 1812.95 Meters above sea level.

Justification of the Project

The proposed Githunguri-Gatitu-Githiga road project is currently graveled. The road is currently dusty hence poses health hazard to area residents and road users. Gravel material surfacing is prone to wear and tear due to weather hence need to seal of surfacing. During the rainy season, the area become inaccessible and this make it hard for the residents to access schools, churches, businesses and residential homes. The local people are vulnerable to accidents since the current road does not have a foot path. Therefore, by establishing a foot path, will reduce human-vehicles conflict thus enhancing accessibility. The project itself justifies its need for existence as it will adequately address the concerns related to accessibility and security.

Public Participation and Consultation

Meetings were held with the project proponent during which, comments on the content, quality and focus of the environmental reports were made. The proceedings of the discussions were incorporated in this report. Consultative meetings with Kenya Urban Support Program (KUSP) coordination team and user departments senior staff from Kiambu County were held. The aim was to agree on the modalities that would inform the project design process. Key Informant

Interviews were also conducted with various key stakeholders. The stakeholders helped in the drafting of the checklists used to predict the impacts for this study. Questionnaires were also used to collect opinions from the residents of project area in Kiambu Municipality and those neighboring the project area.

Summary of Positive and Negative Impacts and the proposed Mitigation Measures

Positive impacts from the proposed project	Negative impacts anticipated from the proposed project
Improved accessibility to the residential areas, businesses and public institutions	Emission of dust and air pollution
Creation of employment during the construction process	Increased noise and vibration during construction phase
Reduction in health hazards posed by dusty road surfaces	Exploitation of water resources
Reduced vehicle operation and maintenance costs	Increased storm water/ run off
Enhanced vibrant 24 hours economy	Potential traffic accidents
Reduced human-vehicle conflict hence reduction in accidents due to provision of foot path	Increased waste generation (both solid and liquid) during construction
Improved drainage along the road	Soil erosion during construction
	The health and safety of workers and immediate residents and neighbors may be compromised due to accidents, pollution and disturbance

Proposed Mitigation Measures

To minimize the occurrence and magnitude of the negative impacts, mitigation measures have been proposed against each of the anticipated impacts. Other measures have been integrated in the project designs with a view to ensuring compliance with applicable environmental laws and guidelines. To ensure project sustainability and environmental enhancement, the study recommends the following mitigation measures to be integrated into the project:

- Careful planning and design of the development to ensure that it is compatible with the environment e.g. not out of scale.
- Erection of warning / informative signs at the site during the construction phase, and traffic control along the connecting roads.
- Soil compaction and watering of loose soils on all unpaved access sections, to minimize air pollution and erosion by the agents of soil erosion.

- Sensitization of workers on the need to switch off engines whenever possible to reduce noise pollution.
- Ensuring that the machinery is well maintained to inhibit frictional noise.
- To cater for storm water drainage, well-designed concrete inverted channel drains shall be provided to harmonize management of the resulting surface water within the site. The drains will be regularly maintained to unclog them and reduce the chances of flooding.
- Workers shall be provided with full protective gear to beef up their health and safety standards and they should be sensitized on health, safety and environmental conservation aspects
- During the construction phase, the contractor shall put in place effective and efficient waste disposal systems. Wastes such excavated soil and debris will be recycled or properly disposed of by backfilling or dumping in approved grounds.
- The contractor shall adapt and implement all the recommendations in the EMP during the project cycle.

Environmental and Social Management Plan (ESMP)

ESMP aim at improving the overall net effect of the proposed project and avoid or minimize the potential negative impacts of the project activities. This report observes that most of the adverse impacts will manifest at the construction phase, therefore, more focus will be put in this phase to ensure maximum mitigation of the proposed impact. This report, therefore, proposes that the ESMP be integrated into the design report with appropriate allocation of funds in the Bills of Quantities (BOQs) to mitigate against adverse environmental and social impacts. The contract for construction should bear clauses binding the contractor to implement impact mitigation as part of the civil works.

Conclusions and Recommendations of the proposed project

This ESIA project report conclude that the proposed project is important for economic development of the project area and has balanced environmental and social considerations and benefits. The report has given adequate measures to mitigate the negative impacts and a management plan proposed which the proponent should adhere to. Further the proponent has complied with and is within the guidelines of the existing legislative and regulatory requirements in relation to the proposed development. In the view of this study, the project as currently proposed is environmentally sound. An ESMP has been outlined to guide resolution of potential adverse impacts while enhancing the positive ones. Further, all negative impacts

need to be mitigated and it is recommended that this project is granted NEMA licensing and other clearances to pave way for implementation.

Project Budget and Timeframe

The upgrading of Githunguri- Gatitu - Githiga Road (1.5KM) to Bituminous Standards (inclusive of foot path and drainage system) project is estimated to cost KES. 60,047,252.78M (Sixty Million, forty seven thousand, two hundred and fifty two Shillings and seventy eight cent) and is expected to be implemented within a period of twelve months from the award of contract.

CHAPTER ONE: INTRODUCTION

1.1 Background and Rationale for the Environmental Impact Assessment

Introduction

Most urban centers in the country are faced with acute infrastructural challenges either in terms of quality or quantity. The high rates of population growth and urbanization have not matched with increase in infrastructural and utilities provision. Crises have therefore resulted which includes transport and accessibility. The proposed project matches the National Government's "Big 4 Agenda" which includes infrastructural provision and improvement or upgrade.

More recently the development, spurred on by regulators in Kenya and in deed globally, has recognized the need for change in order to safeguard the environment. In relation to this, Environmental concerns have now been integrated in the planning and implementation processes of any proposed project (in Kenya). The key objective is to mitigate conflicts with the environment at the vicinity; during implementation and operational phases.

This proposed project is funded by World Bank through KUSP and implemented by the department of Land, Housing, Physical Planning, Municipal Administration and Urban Development. KUSP aim at improving the services in towns which are critical in spurring economic development including transport systems, storm water management, landscaping, solid waste management, security and street lighting among others. The project also supports the strengthening of the public sector management and accountability and is part of the ongoing public sector reform agenda towards achievement of the Sustainable Development Goals (SDGs) and Kenya Vision 2030.

Kenya's framework environmental law, entitled The Environmental Management and Coordination Act (EMCA), Cap 387 is a product of a new methodology for the development of environmental law in the history of the country. Views and aspirations of a wide range of stakeholders both at national as well as at local levels were solicited and incorporated in the Act. This is a major shift from the traditional centralized mode of policy formulation that did not involve the public. The Act is thus designed to promote greater public participation in the management of natural resources and the environment in general. It is through this that Kiambu county has proposed to undertake the Environmental and Social Impact Assessment (ESIA) for all the proposed projects improvement of several urban areas within her boundaries.

1.2 Objectives of the EIA

The purpose of this ESIA process is to identify potential negative and positive impacts of the proposed road project, propose mitigation measures and formulate an Environmental and Social Management Plan (ESMP) articulating envisaged impacts. On the other hand, the main objective of this study is to ensure that all environmental concerns are integrated in the development activities in order to contribute to sustainable development.

The specific Objectives of this EIA are:

- i) To identify and evaluate potential environmental impacts of the proposed project and their significance.
- ii) To propose workable mitigation measures for the significant negative impacts of the proposed project on the environment.
- iii) To consider the environmental, social, economic, cultural and legal considerations regarding the proposed project.
- iv) To facilitate consultative public participation and incorporate expressed views into the project report.
- v) To present the results of the ESIA in a format that can guide informed decision making.
- vi) Compare available alternatives for the proposed project and determine the optimal mix of environmental and economic costs and benefits.
- vii) To prepare a detailed Environmental Monitoring Plan for the proposed project.
- viii) To prepare a detailed Environmental and Social Management Plan (ESMP) for the proposed project.

1.3 Environmental Screening

Screening was conducted through legal review and desktop studies to assess whether there will be a need for an environmental and social impact assessment, and what level of assessment is required. This was done using a screening checklist in accordance to requirements of the Environmental Management and Co-ordination (Amendment) Act, 2015 and the Environmental Impact Assessment and Audit Regulations, 2003 (Second Schedule). Issues considered included the physical location, sensitive receptors near the site and the nature of anticipated impacts. In pursuant with Environmental Management and Coordination Act (EMCA) 1999, (Amendment 2015), the proposed project is classified under medium risk project that require the project to undergo Environmental Impact Assessment.

1.4 Scope of the EIA Study and the Scoping Process

The scoping process, through an ESIA scoping checklist, was conducted to help narrow down onto the most critical issues requiring attention during the assessment. Environmental issues were categorized into physical, natural/ecological and social, economic and cultural aspects. It also included discussions with key stakeholders, managers and design engineers as well as interviews with local communities.

In line with the Second Schedule of EMCA 1999 (amended in 2015) that specifies projects that require to be subjected to EIA studies, the proposed upgrading of Githunguri- Gatitu - Githiga Road was screened and found to be without any concerns that warrant a full cycle ESIA. Therefore, an environmental assessment process resulting to a Project Report was adopted.

In this case, the ESIA was conducted at the proposed project site of the development and the neighborhood. This ESIA was done through physical assessment, interviews with workers, neighbors, relevant stakeholders and government agencies. The process included a systematic examination of the proposed activities such as planning, transportation, construction, decommissioning and operation phases.

During the preparation of this project report, the screening procedure, was adopted as specified in NEMA's Legal Notice 101 of June 2003. This project report therefore incorporates the following:

- i) The nature of the project;
- ii) The Division of the project including the physical area that may be affected by the project's activities;
- iii) The activities that shall be undertaken during the project construction, operation and decommissioning phases;
- iv) The design of the project;
- v) The materials to be used, products, by-products, including waste to be generated by the project and the methods of disposal;
- vi) The potential environmental impacts of the project and the mitigation measures to be taken during and after implementation;
- vii) An action plan for the prevention and management of possible accidents during the project cycle;
- viii) A plan to ensure the health and safety of the workers and neighboring communities;

- ix) The economic and socio-cultural impacts to the local community and the nation in general;
- x) The project budget;
- xi) Any other information that NEMA may require.

In order to achieve all the above, a systematic approach was followed by the consultants who included the general steps outlined below:

- Environmental screening;
- Environmental scoping which provided the key environmental issues;
- Desktop studies;
- Interviews with the Project Proponent;
- Physical inspection of the site and surrounding areas;
- EIA Public participation; and
- Reporting including the preparation of an Environmental and Social Management Plan.

All these aspects were considered accordingly. This report also seeks to ensure that all the potential environmental impacts are identified and that workable mitigation measures are adopted. The report also seeks to ensure compliance with the provision of the EMCA 1999, (amended in 2015), and Environmental (Impact Assessment and Audit) Regulations 2003 as well as World Bank safeguard policies.

The report lays emphasis on the duties of the proponent and contractor during the installation phase as well as the operation phase of this project.

1.5 Study Approach and Methodology

The study adopted an investigative and reporting methodology for conducting Project Report Studies (Legal Notice 101 of EMCA, 1999).

1.5.1 Data Collection Procedure

This project report applied both primary and secondary data. Primary data was collected through consultation with the proponent, site visits and public consultations. The Study key informant interviews, semi-structured interviews and observations. Secondary data was obtained through literature review and desk study.

Data collection involved a review of available project documents with a view to understanding the scope and focus of the proposed upgrading of Githunguri-Gatitu-Githiga road project. On

the other hand, planning reports, baseline reports and other documents from Kiambu County were reviewed to provide an insight into the socio-environmental baseline of the project area. Observations and preliminary opinions formed from such literature review were re-validated during fieldwork undertaken on the project site.

1.5.2 Data Collection Tools

During the field investigations, a survey was conducted in order to collect information on biophysical and socio-economic environment of the project development site and its environs. The following steps were involved;

- Environment screening;
- Environmental scooping;
- Physical inspection of the site and its environs;
- Desktop study;
- Questionnaires;
- Public participation and consultation; and
- Reporting.

1.5.3 Project site assessment

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

1.5.4 Public Participation and consultations

To ensure adequate public participation in the ESIA process, questionnaires were administered to the local communities, leaders, and the information gathered was subsequently synthesized and incorporated into the ESIA project Report. consultation was also done with randomly selected people within the neighborhood of the proposed site and involved use of a semi-structured interview. The consultant incorporated the concerns and views of all stakeholders and the affected people.

1.5.5 Desktop Study

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

1.5.6 Data Analysis and Prediction of Impacts

An analysis on the data collection tools and expert opinions was conducted to predict potential environmental impacts (both positive and negative). The magnitude, significance, and acceptability of predicted impacts were evaluated with a view to determining whether observed adverse impacts are significant enough to warrant mitigation. The stakeholder consultation, predicted impacts, probable mitigation measures and an Environmental and Social Management Plan form part of this report.

1.6 Terms of Reference (TOR)

The EIA study as stipulated under the EMCA, 1999 (amended 2015) was commissioned by the County Government of Kiambu for the upgrading of Githunguri- Gatitu - Githiga Road (1.5KM) to Bituminous Standards (inclusive of foot path and drainage system). Further, prepare a project report for further examination by the National Environmental Management Authority (NEMA) and subsequent licensing to implement the proposed project. This EIA considered the following aspects and others that proved of significance during the study.

- Provision of background and baseline information
- The effects of the development on biodiversity diversity both within and outside the project development site i.e. effects on flora and fauna, habitat quality and issue of habitat disruption.
- Surface water run-off, containment and flood control
- Sustainable use of resources and ecosystem maintenance and enhancement
- Economic implications of the development, employment and livelihoods
- Security – threats, risks and enhancement
- Public health implications
- Social cohesion, culture, emigration and communication
- Demand and development of infrastructure and social amenities
- Assessment of the effects on scenery modification
- Analysis of the compatibility of the development with the surrounding land uses.
- Development of an environmental management plan with mechanisms for monitoring and evaluating the compliance and environmental performance.

1.7 ESIA Guiding Principles

These include;

- It requires that all environmental concerns must be accounted for in all development activities;
- It also encourages public participation in all stages of proposed project development. It increases the ownership and sustainability;
- It also recognizes the role of social and cultural principles traditionally used in the management of the environment and natural resources;
- International cooperation in the use and wise management of shared resources;
- Intra-generation and inter-generation equality;
- Polluter-pays principle; and
- The precautionary principle.

1.8 Justification of the Project

The rapid population growth and urbanization has put immense pressure on the road infrastructure in many urban centers and town in Kenya. This is compounded by inadequate resources and poor planning coupled with competing infrastructural needs which in most cases are always prioritized over road infrastructure. The importance of road infrastructure and utilities cannot be overemphasized. Other than improving the quality of life of the people, good roads enhance accessibility and ease connectivity while at the same time improving the ambience and alter the landscape positively.

Githunguri-Gatitu-Githiga road is currently graveled standard making it inaccessible especially during the rainy season. The design of the road was not meant to handle the huge amount of traffic going through it. This road lack drainage and as a result become inaccessible during the rainy season. This make the residents unable to access their residential homes, schools, churches and businesses. Therefore, upgrading of the proposed road will enhance accessibility. The project itself justifies its need for existence as it will adequately address the concerns related to accessibility and flooding.

1.9 EIA Criteria

The ESIA was carried out in consideration of the environmental management; statutory and regulatory requirements in Kenya as outlined in section 4 of this report, the Environmental (Impact Assessment and Audit) Regulations 2003 and best practice guidelines on safety and health as per the Occupational Safety and Health Act of 2007.

1.10 Project Cost

The proposed project is estimated to cost approximately Sixty Million, forty seven thousand, two hundred and fifty two Shillings and seventy eight cents (KES. 60,047,252.78M).

Summary BoQ for upgrading of Githunguri-Gatitu-Githiga road		
Bill No.	Description	Tender Amount
1	General	9,015,000.00
4	Site clearance & Top soil stripping	570,000.00
5	Earthworks	2,197,000.00
7	Excavation and filling for Structures	1,410,000.00
8	Culvert and Drainage works	6,020,944.05
9	Passage of Traffic	200,000.00
11	Shoulder to Pavement	180,000.00
12	Natural Material Sub Base & Base	8,583,750.00
15	Bituminous Surface Treatments and Surface Dressings	900,000.00
16	Bituminous Mix Bases, Binder Courses and Wearing Course	13,275,000.00
20	Road Furniture	5,415,464.29
23	Concrete Paving Blocks to Footpath	2,160,000.00
25	HIV & AIDS	330,000.00
A	Sub Total 1	50,257,158.34
B	Add 3% Contingencies	1,507,714.75
C	Sub Total 2	51,764,873.09
D	Add 16% V.A.T	8,282,379.69
E	TOTAL (KES)	60,047,252.78

1.11 Report Outline and Presentation

The main outcome of this ESIA study was this report, which was designed to ensure that the proposed development complies with the Environmental Management and Coordination Act (EMCA), 1999 (amended in 2015). The report is organized in chapters as outlined below:

Chapter 1: Background and Rationale for the ESIA.

Chapter 2: Description of the proposed project

Chapter 3: Baseline conditions

Chapter 4: Policy, Legal and Institutional Framework

Chapter 5: Public consultation and Participation.

Chapter 6: Potential environmental and Social Impacts.

Chapter 7: Mitigation measures

Chapter 8: Analysis of project alternatives.

Chapter 9: Environmental and Social Management Plan and Monitoring plan

Chapter 10: Conclusion and Recommendations.

CHAPTER TWO: DESCRIPTION OF THE PROPOSED PROJECT

2.1 Introduction

The proposed project is owned by the County Government of Kiambu (CGK) under Kiambu Municipal Board. It is part of the projects within Kiambu County meant to upgrade various towns to Municipal status. The project is funded by the World Bank through KUSP.

2.2 Nature, Design and Description of the Proposed Project

The proposed project involves the upgrading of Githunguri- Gatitu - Githiga Road (1.5KM) to Bituminous Standards (inclusive of foot path and drainage system). Like many other similar projects, the proposed project is designed and expected to go through various phases (pre-construction, construction, decommissioning and operation) with various activities being conducted at every phase. The works shall include but not limited to:

2.2.1 Description of pre- construction and construction Activities

- Site clearance and topsoil removal.
- Earthworks. Processing, watering and compaction of existing material as sub grade to receive the pavement layers as per the design and specifications. Cut and fill.
- Construction of a 225mm thick layer of natural material as subbase for the carriageway and shoulders.
- Construction of a 150mm thick layer of natural material (hand packed Quarry stones) as base for the carriageway and shoulders.
- Apply 50mm asphaltic concrete type 1 wearing course.
- Construction of standard pipe culverts, stone pitching of open drain and other drainage works.
- Installation of gabions.
- Construction of footpath to paving blocks (cabro) standard.
- Installation of road furniture including service ducts, traffic calming measures, kerbs, road channels, bollards, road signs and road marking
- Maintenance of passage of traffic through and around the works.
- Planting of trees.
- Maintenance of the works during construction. The defects liability period shall be 10 months.
- HIV/AIDS sensitization campaigns

- Any other works as instructed by the engineer and/or as specified in the Project specifications

The road carriageway shall be 6m wide with a footpath of 1.2m width. The side ditch shall be trapezoidal with its invert level being at least 0.7m below the road formation level.

2.2.2 Specific Project Activities

i) Site Clearance and Earth Works

- Removal of trees, hedges, bushes and uprooting of tree stumps. Site clearance of all overburden on road shoulders
- Topsoil stripping along shoulders to be widened.
- Excavation for the road carriageway where widening is necessary
- Re-use of stored material, for material that cannot be reused to be cut to spoil.
- Filling in soft material including benching of shoulders and embankments and compaction

ii) Drainage Works

- Excavation for open and closed drains, backfilling and compaction
- Construction of 450mm and 600mm, diameter cross and access culverts
- De-silting and improvement of outfall
- Stone pitching of the side drains
- Construction of masonry Scour Checks to side drains

iii) Passage of Traffic

- Passage of traffic through the works for the duration of the contract

iv) Pavement Works

- Provision of 225mm thick natural gravel as subbase in two layers
- Provision of 150mm hand packed stones as base layer (including filling of voids)
- Priming the hand packed surface with MC 30 bitumen and a tack coat of K1-60
- Laying of 50mm thick Asphalt Concrete type I wearing course
- Surface dressing

v) Road Furniture and Ancillary Works

- Provision and installation of standard and non-standard road signs.
- Application of road markings as appropriate.

- Construction of kerbs along the road edge, traffic island, junctions, drainage and non-motorized transport.
- Improvement of accesses on feeder roads and business premises where applicable.
- Installation of traffic signs.
- Installation of guard rails where applicable
- Installation of marker posts
- Construction of bumps to control vehicle speed.

vi) Other Works

- Provision of foot path
- HIV/AIDS campaign
- Tree planting

2.2.3 Project Activities during Project Decommissioning

i) Demolition works

Upon decommissioning (unlikely), the project components including pavements and drainage systems will be demolished. This will produce a lot of solid waste, which will be reused for other construction works or if not reusable, disposed of appropriately by a licensed waste disposal company.

ii) Dismantling of Equipment and Fixtures

All equipment including road surface, electrical installations, furniture partitions, pipework and sinks among others will be dismantled and removed from the site on decommissioning of the camp site, the road and other project components. Priority will be given to reuse of this equipment in other projects.

iii) Site restoration

Once all the waste resulting from demolition and dismantling works is removed from the site, the site will be restored through replenishment of the topsoil.

iv) Solid Waste Generation

Large amounts of solid waste will be generated during decommissioning of the project. These will include metal cuttings, rejected materials, surplus materials, surplus spoil, excavated materials, paper bags, empty cartons, empty paint and solvent containers, broken glass among

others. The proponent is advised to take steps to minimize the generation of such waste and to ensure proper disposal procedures or recycling/ generated wastes.

v) Aesthetics

The proponent should ensure high hygiene standards within the premises and surrounding areas during construction and during the operation stages of the project. More so via the prescribed ESMP, the proponent shall put in place several measures aimed at ensuring high standards of hygiene and housekeeping within the premises and surrounding areas.

2.3 Description of Construction Inputs (Products and by-Products)

The proposed road upgrading project will utilize as much as possible materials from within the area and imported. The project inputs will include but not limited to the following:

- Construction raw materials i.e. sand, cement, stones, crushed rock gravel, Murrum, steel metals and metal products, plastic and PVC pipes and materials, timber and timber products, precast and in situ concrete products, iron sheets and iron products, electric cables and conduits, painting materials among others. All these will be obtained from licensed dealers and especially those that have complied with the environmental management guidelines and policies. It is worthwhile noting that most of the construction materials are locally available.
- Construction machines including machinery such as excavators, graders, mixers, and bulldozers and other tools and equipment. These will be used for the transportation of materials, clearing of the vegetation and debris, and in the construction of the project. Such machinery will use petroleum products to provide energy.
- A construction labour force of both skilled and non-skilled workers. These will require services such as energy, water supply and sanitation facilities.
- Large volumes of water for construction purposes. It will be supplied from the area's mains water supply.
- Power from the mains grid or provided by generator.

2.4 Location of the Project

The project is in Ndumberi town, Kiambu Municipality. The road links Ndumberi-Limuru Road (D409) to Ndumberi-Githunguri Road (D404) both being tarmac roads. It is located about 19.7 kilometers northeast of Nairobi City. The geographical coordinates of Ndumberi town are: 1°9'6.59"S, 36°48'19.27"E. The project involves upgrading of Githunguri- Gatitu -

Githiga Road (1.5KM) to Bituminous Standards (inclusive of foot path and drainage system). The GPS coordinates for the road are Latitude: 1°8'52.55"S, Longitude: 36°48'27.18"E, to Latitude: 1°8'49.30"S, Longitude: 36°47'57.12"E. This project road traverses through a relatively flat area serving residential premises, churches and business.



Proposed Githunguri-Gatitu-Githiga Road in Kiambu Municipality

2.5 Site Ownership, Zoning and Land Use

The proposed project is owned by the County Government of Kiambu under the Department of Roads, Transport, Public Works and Utilities and is overseen by the Kiambu Municipal Board Manager. The proposed road upgrading project is located on public land.

The area in which the project is sited is a mixed use though the predominant use is residential. The proposed plans fall in line with the CGK zoning regulations and were prepared by the CGK staff under the supervision of the County Engineers.

2.6 Project Budget

The project is estimated to cost approximately Sixty Million, forty seven thousand, two hundred and fifty two Shillings and seventy eight cents (KES. 60,047,252.78M) and is to be financed by the World Bank through the Kenya Urban Support Program (KUSP).

CHAPTER THREE: BASELINE CONDITIONS

3.1 Overview and Location of the project

Overview

This section presents the geographic characteristics, baseline environmental conditions including the socio-economic conditions within 2km² of the project site. For convenience, the description of the larger Kiambu area is provided followed by presentation of details that are more specific to the project site. It should however be noted that the comprehensiveness of the descriptions of the general geographic and environmental characteristics of the assessment area is variable being governed by availability of relevant data and information.

Location of the project

The proposed project is in Ndumberi town in Kiambu Municipality, Kiambu County. Ndumberi town is located within Kiambu County, which is one of the 47 counties of Kenya, the overall population of the county estimated at 1,623,282 populations according the 2009 census report from the Ministry of Planning and National Development and an annual growth rate of 2.3% per annum. The County has a total Square Kilometer of 2543.4 km² major towns in the county include Kiambu, Thika, Kikuyu, Limuru, Githunguri and Gatundu which is the target project area. Kiambu County borders Nairobi and Kajjido Counties to the South, Machakos to the East, Murang'a to the North and North East, Nyandarua to the North West, and Nakuru to the West. The County lies between latitudes 0° 25'and 1° 20'S of the Equator and Longitude 36° 3 Land 37° 15'E.

3.2 Physical Environment

3.2.1 Climate

The county experiences bi-modal type of rainfall. The long rains fall between Mid-March to May followed by a cold season usually with drizzles and frost during June to August and the short rains between Mid - October to December. The annual rainfall varies with altitude, with higher areas receiving as high as 2,000 mm and lower areas of Thika Town constituency receiving as low as 600 mm. The average rainfall received by the county is 1,200 mm. The mean temperature in the county is 26° C with temperatures ranging from 7°C in the upper highland areas to 34°C in the lower midland zones. July and August are the months during which the lowest temperatures are experienced, whereas January to March is the hottest months. The county's average relative humidity ranges from 54 percent in the dry months and

300 percent in the wet months of March up to August. The proposed project site adopts the existing climatic conditions of the entire area and the county in general.

3.2.2 Hydrology

The county has eight licensed Water Service Providers (WSPs) Companies namely: Limuru Water and Sewerage Company, Kikuyu Water and Sewerage Company, Kiambu Water and Sewerage Company, Karuri Water and Sewerage Company, Githunguri Water and Sewerage Company, Ruiru- Juja Water and Sewerage Company Limited, Gatundu Water and Sanitation Company and Thika Water and Sewerage Company Limited. About 90 percent of the county's water resources comprise of both surface and ground water resource potential. Thirty five percent of the population have access to potable water. The project area is connected to the Kiambu Water and Sewerage Company water pipeline for water services.

3.2.3 Topography and Drainage

The general area is characterized by topography both with gentle slopes and flat topography. The elevation of the area is approximately 1,200-1,360m ASL. The subject proposed site has moderate to gentle gradient at various points and the general area in the environs is in some places characterized by gentle gradients and level. The project road traverses through a relatively flat area serving a wide range of residential premises, businesses premises, churches and other institutions. The site is covered by poorly drained and dominated by red soils.

3.2.4 Geology and Soils

The area lies between 1,200-1,360m above sea level. The area is characterized by gentle slopes and is built up as well. The soils are mainly red with no rocky outcrops. The soils along the road route are mainly red soils which are suitable for road construction. These soils are of varying fertility levels with soils from high-level uplands, which are from volcanic rocks being very fertile. Kiambu is categorized as the lower midland zone.

3.3 Biological Environment

3.3.1 Fauna

Kiambu County has few wildlife resources. Kikuyu Escarpment forest has a dense forest with elephants, hyenas, bush baby, baboons, colobus monkeys, dik-dik, bush pigs, tree and ground squirrels, porcupines and many species of birds such as weaver, guinea fowls, sparrow among others. The county has also a variety of animal species like mammals, birds, reptiles, insects and arthropods. The project area has various animal species of birds, insects, reptiles and small insects however, the proposed project site does not have any significant endemic animal species

that will be affected in any way by the project activities save for a few insects present in the area.

3.3.2 Vegetation and Flora

Biodiversity of the project area is highly influenced by human activities. The area lies within Agro-Eco-zone III and IV where agriculture is the main economic activity practiced by people, tea and coffee farming is the main cash crop grown, other crops include cabbages, irish potatoes and dairy farming. Trees are used mainly for shade, boundary demarcation, fencing, and production of fruits, timber, and fuel wood and for ornamental purposes. Common trees in project area include: *Cupressus lusitanica*, *Eucalyptus* spp, *Markhamia lutea*, *Croton megalocarpus*, *Pinus patula*, *Juniperus procera* just to mention a few. Common fruit trees include plums, ovacando and pairs. However, the fact that Ndumberi is 19km away from Nairobi central business District, population and housing demand pressure has resulted to landowners changing land use from original agricultural use to residential and commercial land. This pressure has resulted to change of land use from agricultural land to commercial to provide land for establishment of housing units.

3.4 Social economic Setup

3.4.1 Target Population

Ndumberi town is located within Kiambu Municipality in Kiambu County which is one of the 47 counties; Kiambu County had a population of 2,417,735 according to the 2019 census report from the Ministry of Planning and National Development. The County has a total Square Kilometer of 2543.4 km². According to the Kenya National Bureau of Statistics (KNBS) Report, the total population for the Project area (Ndumberi ward) was 35,823 in 2017. In terms of gender, the sex ratio of male to female is approximately 1:1.02. Population is a major driver of environmental change in the area and as such is a determinant of other parameters such as land-use patterns, settlement and other social amenities.

3.4.2 Settlement Patterns

The settlement patterns in Ndumberi and environs are influenced by rural to urban migration, good infrastructure and proximity to Kiambu Town as well as Nairobi city. Majority of the population reside within Kiambu and Ndumberi Towns. The project area is densely populated, and land is subdivided into small sizes. Currently, there is a high rate of change of user of land from agricultural to residential due to high housing pressure from Kiambu town and Nairobi city.

3.4.3. Land Use Patterns

The size of arable land in the county is 1,878.4 Km², the non-arable land is 649.7 Km² and 15.5 Km² is under water mass. The average holding size of land is approximately 0.36 Ha on small scale and 69.5 Ha on large scale. 85 percent of the population with land in the county have title deeds to their land and there are no recorded cases of incidences of landlessness. The remaining 15 percent have not received their title deeds due to unfinished land adjudication process. The project area is zoned under mixed use development of agricultural, commercial and residential allowing for the project implementation as it is in line with the zoning stipulations of the Physical and Land Use Planning Act, 2019.

3.4.4 Administrative Units

The County is divided into twelve (12) sub-counties namely Limuru, Kikuyu, Kabete Lari, Gatundu South, Gatundu North, Githunguri, Kiambu, Kiambaa, Ruiru, Juja and Thika Town. These are further divided into 60 wards. The proposed project lies within Ndumberi ward in Kiambu Sub-county. Ndumberi ward covers an area of 16.11Sq.km. It has four sub-locations namely; Ndumberi, Karunga, Ngegu and Kanunga Sub-Locations of Kiambu County.

3.5 Public Social Services

3.5.1 Road and Rail Network

The county has a total of 2,033.8 km of roads under bitumen standards, 1,480.2 km under gravel surface and 430.1 km under earth surface. It also has 131 km of railway line and four railway stations in Ruiru, Thika, Kikuyu and Limuru towns. There is a great need in improving the condition of the roads since during the rainy season, most of the roads become impassable. However, the terrain poses a great challenge for road maintenance. There has been a lot of improvement in the road's subsector with the example of Ndumberi-Limuru Road (D409), Ndumberi-Githunguri Road (D404) etc. However, more need to be done to improve roads networks especially in the proposed project area and the environ.

3.5.2 Communications Services

Kiambu County is well covered by mobile network which is estimated at 98 percent while the landline coverage is at 214 connections in the entire county. There are 19 post offices and 14 sub-post offices which are fairly distributed within the county. It has 149 cyber cafes and eight private courier services located in the urban centres of Thika, Ruiru, Karuri, Kiambu, Limuru and Kikuyu. The project area is well served with various communication networks which have strong implication on the socio- economic development activities. The project area is also well

served with mobile phone and telephone services like Orange, Safaricom and Airtel. The area is also well connected to major telecommunication services.

3.5.3 Energy Access and power supply

The main source of cooking energy in the County is firewood which accounts for about 47.3 percent, while paraffin is the major source of lighting fuel. This poses a great challenge to the realization of 10 percent forest cover within the County. Connection to the national grid is good with 98 percent of all trading centers connected and only 4 percent of public institutions not connected. However, connection to individual homes is low and there is need for up-scaling of the rural electrification programme. The project area is well connected to the KPLC national power grid.

3.5.4 Housing

The housing type by wall materials in Kiambu County is mainly characterized by stone, brick/block, mud/wood and corrugated iron sheet. According to 2009, Kenya Population and Housing Census, 48.3 percent of all homes in the county are stone –walled, 4.9 percent are brick/block, and 4.8 percent are mud/wood. There are 74.6 percent of the houses that have cemented floors and 87.5 percent have corrugated iron sheets. Only 0.1 percent has used other forms of roofing materials.

3.5.5 Markets and Urban Centres

The County has a total of 2,517 trading centres with 6,634 registered retail traders and 750 registered wholesale traders. There are also several urban centres with the largest being Thika Town which is one of the largest industrial towns in the country. Other urban centres include Kiambu, Karuri, Kikuyu, Limuru, Gatundu and Ruiru.

3.6 Sensitive Ecosystems or Places of Cultural Importance

There are no sensitive ecosystems or places of cultural importance within the project site or in the environs.

CHAPTER FOUR: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 Introduction

Kenya has a policy, legal and administrative framework for environmental management. The Government's policy on road transport is to provide efficient and reliable road network to spur socio-economic development and improve security. Under the administrative framework, the National Environment Management Authority (NEMA) is responsible for ensuring that environmental and social impact assessments (ESIA) are carried out for new projects and environmental audits on existing facilities as per the requirements of the Environmental Management and Coordination Act (EMCA) 1999 Amended 2015. Projects subject to this requirement are specified in the Second Schedule of the EMCA, 1999.

The financing institutions such as the World Bank through its IFC branch has also developed a policy on Social and Environmental Sustainability that strives for positive development outcomes in the private and public sector. In order to achieve this, it has set up Performance Standards as well as General and Industry specific Environmental Health Safety guidelines against which projects are reviewed. These guiding principles are referred to as the Equator Principles. The thrust of the Equator Principles is to ensure that projects under financing are developed in a manner that is socially responsible and reflect sound environmental management practices.

According to EMCA, 1999 (Amendment, 2015), ESIA's are carried out in order to identify both potential positive and negative impacts associated with the proposed project. This aim at developing the positive impacts and develop mitigation measures for the negative impacts. The ESIA also ensures that baseline environmental and socio-economic data for the proposed project is collected and used in the design of projects financed by the financial institution. The data generated is also used for monitoring and evaluating project impacts during the project cycle. It is also a requirement by both NEMA and World bank that a clear management plan and action plan that describe and prioritize the actions needed to implement mitigation measures are put in place. In this Chapter, a review of regulations that guide an ESIA on a road project will be done.

The Environmental and Social Impact Assessment (ESIA) is a legal requirement in Kenya for all proposed development projects. Therefore, the government of Kenya has established regulations to facilitate ESIA's and environmental audits processes. These requirements are stipulated in the EMCA, 1999 (Amended, 2015) and EIA/EA Regulations 2003. This section

outlines the Policy, Legal and Institutional framework pertaining to the proposed road development project.

4.2 National Policy Framework

The Kenyan Government has a policy, legal and administrative framework for environmental management. The broad objectives of the national environmental policy in Kenya are to:

- Integrate environmental conservation and socio-economic aspects in the development process.
- Conserve natural resources such that the resources meet the needs of the present without jeopardizing future generations in enjoying the same.
- Ensure optimal use of natural resources while improving environmental quality.
- Develop awareness that inculcates environmental stewardship among the citizenship of the country.
- Ensure that national environmental goals contribute to international obligations on environmental management and social integrity.

To achieve this policy objectives, it is a policy directive that appropriate reviews and evaluations of all forms of developmental project plans and operations are carried out to ensure compliance with the environmental policy and legal frameworks. The following section provides details on the relevant policies in the country.

4.2.1 The Constitution of Kenya (2010)

The Constitution is the supreme law of the Republic and binds all persons and all State organs at all levels of government. Article 42 of Bill of Rights of the Kenyan Constitution provides that every Kenyan has a 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 legislation and other measures. Chapter 5 of the Constitution focus on land and the environment. The constitution requires that land be used and managed in a manner that is equitable, efficient, productive and sustainable. 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 provide encourages efforts towards sustainable of natural resources, increasing of the national forest cover public participation in the management, protection and conservation of the environment, protection of genetic resources and biodiversity, environmental impact assessment, environmental audit and monitoring of the environment, etc. The proposed project should ensure compliance with the constitutional requirements in as far as equitable sharing of

the resources between various stakeholders is concerned on matters of sustainability of livelihoods and biological resources public participation among others.

The Kenyan constitution also gives prominence to public participation; as a general national value in environmental protection. Article 69(1) states that the State shall encourage public participation in the management, protection, and conservation of the environment.

Therefore, the constitution of Kenya provides for sound management and sustainable development of all of Kenya's projects, both public and private investments. It also calls for the duty given to the Project proponent to cooperate with State organs and other persons to protect and conserve the environment as mentioned in Part II.

4.2.2 The Kenya Vision 2030

Sessional Paper Number 10 of 2012 on Kenya Vision 2030 is the National Policy Economic Blueprint that entrenches Kenya Vision 2030 as the long-term development strategy for Kenya towards achieving a “globally competitive and prosperous country with a high quality of life by 2030. Specifically, Vision 2030 aims at transforming Kenya into “a newly industrializing, middle income country providing a high quality of life to all its citizens in a clean and secure environment as anticipated in the Millennium Development Goals and is anchored on 3 pillars1:

- The Economic Pillar aims to achieve a sustained annual growth rate of 10% to 2030,
- The Social Pillar seeks to create a just, cohesive and equitable social development, and;
- The Political Pillar envisions a democratic system that is issue based, people centered, results oriented and is accountable to the public.

The Kenya Vision 2030 is being implemented in five-year successive Medium-Term Plans (MTP). The first plan covered the period 2008-2012. The Medium-Term Plan (MTP 2013-17) is the second in a series of successive 5-year plans. The second MTP 2013-2017 draws on lessons learnt in implementing the first MTP. It seeks to implement the flagship projects identified under Vision 2030 over the five-year period together with incomplete flagship and other projects and programs in the previous Medium-Term plan. It will also take due cognizance of the devolved structure of government following promulgation of the Constitution of Kenya 2010 and recent discovery of oil and mineral resources. Therefore, this project touches on the main pillars that form the Kenya Vision 2030 and thus very relevant for this study.

4.2.3 National Environment Policy (NEP)

The Sessional Paper No. 6 of 1999 focus on Environment and Sustainable Development and its key objectives include;

- To ensure that from the onset, all development policies, programmes and projects take environmental considerations into account,
- To ensure that an independent environmental impact assessment (EIA) report is prepared for any development before implementation,

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

Therefore, the proposed Project shall implement the Environmental and Social Management and Monitoring Plan (ESMMP) to mitigate the impacts of the resulting impacts during the construction and operational phases of the proposed project, this will ensure that the sensitive ecosystems are not destabilized by the subsequent Project activities.

4.2.4 The National Poverty Eradication Plan

The main objective of National Poverty Eradication Plan is to

- Reduce the incidence of poverty in both rural and urban areas by 50 percent by the year 2015;
- Strengthen the capabilities of the poor and vulnerable groups to earn income.
- Narrow gender and geographical disparities and create a healthy, better-educated and more productive population.

This plan has been prepared in line with the goals and commitments of the World Summit for the Social Development (WSSD) of 1995. The plan focuses on the four WSSD themes of the poverty eradication; reduction of unemployment; social integration of the disadvantaged people and the creation of an enabling economic, political, and cultural environment. This plan is to be implemented by the Poverty Eradication Commission (PEC) formed in collaboration with Government Ministries, community-based organizations and private sector. Therefore, the proposed project aims at creating a conducive economic environment for the residents of

Ndumberi town and creates employment either directly or indirectly. This improves the quality of life of the residents and thus relevant or applicable for this assessment.

4.2.5 The Poverty Reduction Strategy Paper of 2000

The general objective of Poverty Reduction Strategy Paper (PRSP) for Kenya is to reduce poverty and promoting economic growth. This policy articulates Kenya's commitment and approach to tackling endemic poverty through involvement of the poor communities in both rural and urban areas in various socio-economic development activities. The proposed project, during and after implementation will offer various employment opportunities to people in Kiambu municipality and will therefore contribute directly towards the realization of the broad national goal of reducing poverty in the country. In addition, the proposed project would stimulate economic development by creating an enabling environment for other key sectors of the economy to thrive.

4.2.6 The National Biodiversity Strategy of 2000

This was developed to enable Kenya address national and international commitments defined in Article 6 of the Convention on Biological Diversity (CBD). The strategy is a national framework of action for ensuring that the present rate of biodiversity loss is reversed, and present levels of biological resources are maintained at sustainable levels for posterity. The broad objectives of this strategy are to:

- Conserve Kenya's biodiversity;
- Sustainably use its components;
- Fairly and equitably share the benefits arising from the utilization of biological resources among the stakeholders; and
- Enhance technical and scientific cooperation nationally and internationally, including the exchange of information in support of biological conservation.

The proposed road project will need to comply with the requirements of this strategy.

4.3 Legal Framework

Kenya has legal framework that guides environmental management and conservation in the country. Most of these are sector specific and cover a wide range of issues including public health, soil conservation, protected areas conservation, endangered species, public participation, water rights, water quality, air quality, excessive noise control, vibration control, land use, among others. The relevant legislations are described in the following sections.

4.3.1 Environmental Management and Coordination Act, 1999, amended in 2015

EMCA, 1999 provides for the establishment of a Legal and Institutional Framework for the management of the environment and for matters connected therewith and incidental thereto. Just as in the new constitution, Part II of EMCA confers to every person the right to a clean and healthy environment and to its judicial enforcement. The new Constitution, 2010 and EMCA, 1999, therefore obligates the project's Executing Agency and Contractor to work in a clean environment and not to contravene the right of any person within its zone of influence, to this entitlement.

This act applies to the proposed project at one stage or the other and therefore the project proponent is required to understand and conform with the Act accordingly. One such area is Environmental Impact Assessment. This is expressly stated in section 58(2) of the Act. "The proponent of a project shall undertake or cause to be undertaken at his own expense an Environmental Impact Assessment study and prepare a report thereof where the authority, being satisfied, after studying the project report under sub-section (1), that the intended project may or is likely to have or will have a significant impact on the environment, so directs."

EMCA, 1999 (amended 2015) has provided for the development of several subsidiary legislations and guidelines which govern environmental management and are relevant to the Project implementation. These regulations include the following:

i) The Environmental (Impact Assessment and Audit) Regulations, 2003

These regulations provide guidelines for conducting Environmental Impact Assessments and Audits. The regulations provide details on the parameters to be evaluated when undertaking an EIA study. It also provides guidelines on the conduct of environmental audits and development of project monitoring plans. The regulation further explains the legal consequences of partial or non-compliance to the provisions of the Act. In the second schedule, the proposed road project is listed among the projects that require an ESIA before commencement. Therefore, this proposed project must comply with the requirements of the regulations that also include conducting continuous monitoring and annual audits on the proposed project.

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

In Legal Notice No. 121 of the Kenya Gazette Supplement No. 69 of September 2006, the regulations guiding waste management are well described. These regulations offer legal provisions on handling of a variety of wastes emanating from various projects and activities.

The waste categories covered by the regulations include: Industrial wastes, Hazardous and toxic wastes, Pesticides and toxic substances, Biomedical wastes and Radio-active substances.

These regulations also outline the requirements for handling, storing, transporting, and treatment /disposal of all waste categories as provided therein. The proposed project may involve use of materials that release hazardous waste during construction including bitumen/tar, cement, oil spillage from vehicles. Therefore, it is very vital for the proponent to adhere to the provisions of this regulation.

iii) EMCA (Water Quality) Regulations, 2006

These regulations provide guidelines on the use and management of water sources in order to safeguard quality of water for domestic use and irrigation, among others. The proposed project will need to comply with the requirements of this regulation in order to ensure water sources along the route are protected from pollution and over abstraction. The project will also need to comply with the regulations that prohibit undertaking of development within a minimum of 6m from the highest ever recorded flood level of a river system. Section 4(2), 6 and Section 24 of the regulation prohibits pollution of water bodies and requires that all substances discharged into the water bodies should meet the standards set under the Third Schedule of the regulation. Any person undertaking a development project is required desist from any actions, which directly or indirectly cause water pollution, whether or not the water resource was polluted before the enactment of the EMCA Gazetted in 1999. It is an offence to contravene the provisions of these regulations with a fine not exceeding five hundred thousand shillings.

In response to the above, the project design team should be advised on the requirements of this regulation and appropriately incorporate the regulations in the project design document.

iv) EMCA (Fossil Fuel Emission Control) Regulations 2006

These regulations aim at eliminating or reducing emissions emitted from internal combustion engines to acceptable levels. This is described in Legal Notice No. 131 of the Kenya Gazette Supplement No. 74 of October 2006. The regulation provides guidelines on use of clean fuels, use of catalysts and inspection procedures for engines and generators. This regulation is applicable to the proposed project since there will be using vehicles, machineries and equipment that depend on fossil fuel as their source of energy e.g. petrol, engine oil and diesel. The requirements of the regulation must be implemented in order to eliminate or reduce air quality degradation. Sections of the regulation citing the standards of recommended emission

levels will be given to the contractor and or pinned at strategic points in the contractor's field offices.

v) **Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Control Regulations, 2009**

These regulations prohibit excessive noise and vibration. The 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. Therefore, the contractor of the proposed project will have to ensure that no excessive noise and vibrations are made during the construction of the road. This is important since the construction of the proposed road will involve use of heavy earthmoving equipment and trucks which can generate excessive noise and vibrations. Vehicles used during the construction of the proposed road should also adhere to the regulations which prohibit excessive noise. The provision of the act on motor vehicle states that no person shall operate a motor vehicle which produces any loud and unusual sound exceeding 84 dB(A) when accelerating. The Act also states that no person shall at any time sound the horn or other warning device of a vehicle except when necessary to prevent an accident or an incident. Any person carrying out construction, demolition, mining or quarrying work should ensure that the vibration levels do not exceed 0.5 centimeters per second beyond any source property boundary or 30metres from any moving source.

vi) ***EMCA (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006***

These regulations provide that no person shall engage in any activity that may have an adverse impact on any ecosystem; may lead to the introduction of any exotic species or to unsustainable use of natural resources, without an Environmental Impact Assessment License issued by the Authority under the Act. The regulation requires NEMA in consultation with the relevant lead agencies, to impose bans, restrictions or similar measures on the access and use of any threatened species in order to ensure its regeneration and maximum sustainable yield. The proposed road construction should conform to the said regulation.

4.3.2 The County Governments Act 2012

This is an Act of parliament to give effect to Chapter Eleven of the Kenyan Constitution; to provide for County government's powers, functions and responsibilities to deliver services and for connected purposes. Section 113 of the Act makes public participation in County planning

processes compulsory. Therefore, the proposed project will according to the County Government act of 2012 ensure that the project activities conform to the Act.

4.3.3 The Urban Areas and Cities Act 2011

This Act provides legal basis for classification of urban areas (City when the population exceeds 500,000; a municipality when it exceeds 250,000; and a town when it exceeds 10,000) and requires the city and municipality to formulate County Integrated Development Plan (Article 36 of the Act). Under Article 36, the integrated development plan so developed is required to be the central pillar in public administration of the city or municipality this forming the basis for: i) the preparation of environmental management; ii) preparation of valuation rolls for property taxation plans; iii) provision of physical and social infrastructure and transportation; iv) preparation of annual strategic plans for a city or municipality; v) disaster preparedness and response; vi) overall delivery of service including provision of water, electricity, health, telecommunications and solid waste management; and vii) the preparation of a geographic information system for a city or municipality. The strategy plan as stated in 4) above denotes an annual plan to be adopted in the county assembly following the integrated development plan, and the Act requires the board of town committee to formulate the strategy plan soon after the adoption of the integrated development plan (Article 39). The integrated development plan as stipulated in the Act has to reflect;- i) vision for the long term development of the city or urban area; ii) an assessment of the existing level of development; iii) any affirmative action measures to be applied; iv) development priorities and objectives; v) development strategies which shall be aligned with any national or county sectoral plans and planning requirements; vi) a spatial development framework; vii) operational strategies; and viii) applicable disaster management plans; ix) a regulated city and municipal agricultural plan; x) a financial plan; and xi) the key performance indicators and performance targets (Article 40). The integrated development plan thus formulated must be submitted to the county executive committee, and the committee must submit the plan to the county assembly with an opinion within 30 days (Article 41). The Urban Areas and Cities Act is thus a powerful strategic tool designed to inject order into the planning and management of urban areas. The Kiambu CIDP identifies infrastructural / road development and upgrading as a high priority investment towards unlocking the County's economic potential. Therefore, the proposed project is geared towards maintaining the Municipal status of the town and therefore the stipulations in the Act are quite important.

4.3.4 Public Private Partnership (PPP) Act, 2013

The PPP Act, 2013 is an Act of Parliament that was signed into law in February 2013. It provides for the participation of the private sector in the financing, construction, development, operation, or maintenance of infrastructure or development projects of the Government through concession or other contractual arrangements; the establishment of the institutions to regulate, monitor and supervise the implementation of project agreements on infrastructure or development projects and for connected purposes. The Act also established a PPP unit committee whose powers and functions are provided in section 7 of the Act. This project is conducted under the PPP initiative.

4.3.5 The Physical Planning Act (Cap 286)

This Act provides for the preparation and implementation of physical development plans for connected purposes. The Act (Section 36) provides for environmental impact assessments and states that 'if in connection with a development application a local authority is of the opinion that proposals for industrial location, dumping sites, sewerage treatment, quarries or any other development activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an environmental impact assessment report'. The Act promotes public participation in the preparation of plans and requires that in preparation of plans proper consideration be given to the potential for economic and social development. Therefore, the proponent and contractors of the proposed road will need to comply with the requirements of this Act.

4.3.6 The Land Registration Act, 2012

This is an Act of Parliament that revises, consolidates and rationalizes the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes. This Act requires that proper marking and maintenance of boundaries. An interested person who has made an application to the Registrar for his/her boundaries to be ascertained, the Registrar shall give notice to the owners and occupiers of the land adjoining the boundaries in question of the intention to ascertain and fix the boundaries. Regarding the maintenance of boundaries, the Act requires every proprietor of land to maintain in good order the fences, hedges, stones, pillars, beacons, walls and other features that demarcate the boundaries, pursuant to the requirements of any written law.

4.3.7 The National Land Commission (NLC) Act, 2012

The constitution of Kenya 2010 provided the establishment of the National Land Commission of Kenya which is an independent government commission. The main mandate is to, manage public land on behalf of the national and county governments, initiate investigations into present or historical land injustices, recommend appropriate redress, monitor and have oversight responsibilities over land use planning throughout the country. The NLC was established under The National Land Commission Act, 2012 and its mandate is drawn from the National Land Policy of 2009, Constitution of Kenya 2010, National Land Commission Act, 2012, the Land Act 2012 and the Land Registration Act of 2012. Under the National Land Commission Act, the Commission shall among other duties monitor the registration of all rights and interests in land and ensure that public land and land under the management of designated state agencies are sustainably managed for their intended purpose and for future generations. The NLC is also required to manage and administer all unregistered trust land and unregistered community land on behalf of the county government and develop and encourage alternative dispute resolution mechanisms in land dispute handling and management. The Commission is also required in consultation and cooperation with the national and county governments, to establish county land management boards for the purposes of managing public land.

4.3.8 Occupational Health and Safety Act (OSHA), 2007

OSHA, 2007 provides for the safety, health and welfare of workers and all persons lawfully present at workplace, as well as the establishment of the National Council for Occupational Safety and Health and for connected purposes. Section 19 of the Act provides that an occupier of any premises likely to emit poisonous, harmful, injurious or offensive substances, into the atmosphere shall use the best practicable means to prevent such emissions into the atmosphere and render harmless and inoffensive the substances which may be emitted. Section 16 provides that no person shall engage in any improper activity or behavior at the workplace, which might create or constitute a hazard to that person or any other person. The contractors of the proposed road will need to fully comply with the requirements of the Occupational Safety and Health Act 2007. Therefore, the project will require a significant amount of manpower during construction resulting in quite a number of people being employed either permanently or as casual workers. The security and the welfare of the workers on site and other people near the project site from related risks is thus of essence and will be protected under this Act.

Other relevant stipulations in this Act include:

Sub-sections	Details
Subsection 17 - Drainage of floors.	Where any process is carried on which renders the floor liable to be wet to such an extent that the wet is capable of being removed by drainage, effective means shall be provided and maintained for draining off the wet.
Subsection 18 - Sanitary conveniences.	Enough and suitable sanitary conveniences for persons employed in the workplaces shall be provided, maintained and kept clean, and effective provision shall be made for lighting the conveniences and where persons of both sexes are, such conveniences shall afford proper separate accommodation for persons of each sex
Subsection 21 – Prime movers	Every flywheel directly connected to any prime mover and every moving part of any prime mover, shall be securely fenced, whether the flywheel or prime mover is to be situated in an engine –house or not. Head and tailrace of every water wheel and of every water turbine shall be securely fenced. Every part of electric generators, motors and rotary converters and every flywheel directly connected thereto shall be securely fenced unless it is in such a position or of such construction as to be safe to every person employed or working in the premises as it would be if securely fenced.
Subsection 22 -Transmission Machinery	This sub-section requires that; (1) Every part of transmission machinery shall be securely fenced unless it is in such a position or of such construction as to be safe to every person employed or working in the premises, as it would be if securely fenced. Efficient devices or appliances shall be provided and maintained in every room or place where work is carried on by which the power can promptly be cut-off from transmission machinery in that room or place. (3) Every machine intended to be driven by mechanical power shall be provided with an efficient starting and stopping appliance, the control of which shall be in such a position as to be readily and conveniently operated by the person operating the machine.
Subsection 25 - Construction and maintenance of fencing	All fencing or other safeguards provided in pursuance of the a foregoing provisions shall be of substantial construction, constantly maintained, and kept in position while the parts required to be fenced or safe guarded are in motion or in use except when any such parts are necessarily exposed for examination and for any lubrication or adjustments shown by such examination to be immediately necessary.
Subsection 13 – Cleanliness	Every workplace shall be kept in a clean state and free from effluent arising from any drain, sanitary convenience or nuisance.
Subsection 14 – Overcrowding	A workplace shall not while work is carried on be so overcrowded as to cause risk of injury to the health of the persons employed therein. Standard cubic space allowed for every person in a workroom should not be less than three hundred and fifty cubic feet.
Section 51 Air pollution	Preventive measures shall be put in place during operation of the project to prevent fumes and exhaust gases from entering to the atmosphere.

4.3.9 The Public Health Act (Chapter 242) of Revised Edition 2012

This is an Act of Parliament that provides for securing and maintaining good health of citizens. Part III and IV of the Act focuses on notification, prevention and suppression of infectious diseases, including inspection, disinfection and provision of medical aid to affected parties in case of outbreaks of infectious diseases. Part IX section 115 of the Act states that no person/institution 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. Sanitation, housing, disease outbreaks and communal resource sharing are obvious issues in construction projects. The Public Health Act provides the necessary legal guidelines regulating measures aimed at effective control and management of the said issues.

The upgrading of the proposed road has potential pollution risks related to water and air. Therefore, the contractor will need to ensure that air and water pollution is controlled and does not affect people living along the road and even workers residing in construction site established at the project area. The contractor shall ensure that the food that is provided to the workers during construction of the Project meets the safety requirements as stipulated in the Act.

4.3.10 HIV / AIDS Act, 2006

This Act, Section 3 stated the purpose of the legislation including public awareness and rights to people living with HIV/AIDS. It also indicated that Public awareness shall be achieved through education, public campaigns even at workplaces. HIV/AIDS Act, 2006 provide guidelines unto which the project shall follow in educating workers and staff and providing of incentives to combat HIV/AIDs. Since construction activities influences social behavior in a manner that may perpetuate the spread of HIV/AIDs, therefore, a budgetary allocation should be made to complement sensitization and management efforts of agencies dealing with HIV/AIDs issues in the project area.

4.3.11 The Penal Code (Cap. 63)

The Penal Code (Cap. 63) chapter on “Offences against Health and Conveniences” strictly prohibits the release of foul air into the environment, which affects the health of other persons. Any person who voluntarily violates the atmosphere at any place, to make it noxious to health of persons in general dwelling or carrying out business in the neighborhood or passing along

public ways is guilty of misdemeanor and shall be subjected to imprisonment not exceeding two years with no option of fine. Under this code, any person who for the purpose of trade or otherwise makes loud noise or offensive awful smell in such places and circumstances as to annoy any considerable number of persons in the exercise of their rights, commits an offence, and is liable to be punished for a common nuisance, i.e. imprisonment not exceeding one year with no option of fine. The contractor of the proposed road will therefore need to ensure that all emissions are controlled during the construction phase of the project to avoid interference on health of the local communities and the workers.

4.3.12 Work Injury Compensation Benefit Act (WICBA) 2007

When the workers experience works related injuries and diseases contracted in the course of employment, the WICBA, 2007 provides guidelines on how they should be compensated. According to the WICBA, 2007, all employees to be provided with compulsory insurance. It further indicates that an employee is any worker on contract of service with employer. Therefore, it will be important for the Contractor of the proposed project to ensure that all workers contracted during the project implementation phase are provided with appropriate insurance covers so that they can be compensated in case they get injured while working.

4.3.13 The Employment Act, 2007

The fundamental rights of employees including the basic conditions of employment of workers are well defined in the Employment Act 2007. The Act also regulates employment of children. The following are specific things that the contractor needs to do on project site;

- To employ casual Labourers probably from the community in the project area.
- To Observe the basic conditions of employees to avoid unnecessary conflicts during the construction works.
- To pay the entire amount of the wages earned by or payable to the workers and this should be done at the end of a working day at or near the place of work.
- To ensure that all statutory deductions are submitted without delay to appropriate government agencies e.g. Kenya Revenue Authority, NSSF, NHIF, among others.

4.3.14 The Traffic Act Cap 403 of 2013

This Act reserves the use of the road corridor for road facilities only. The Act clear spell out that the vegetation grown to protect the road edges should not cause problems during maintenance. Further state that, encroachment along the road corridor will have to be checked

especially during the operational phase of the project. The Act also spells out conditions for use of roads by motorists, among others.

4.3.15 The Kenya Roads Board Act, 1999

This is the one of the legal instruments that governs management of road network in the country. The Act is very vital as it offers a platform for consultation and cooperation with the road's authorities.

4.3.16 Persons with Disability Act, Revised Edition 2012 (2003) Chapter 133

This Act provide for the rights and rehabilitation of persons with disabilities; to achieve equalization of opportunities for persons with disabilities; to establish the National Council for Persons with Disabilities; and for connected purposes. It protects the rights of people with disabilities by ensuring they are not marginalized and that they enjoy all the necessities of life without discrimination.

The act guarantees that;

- No person shall deny a person with a disability access to opportunities for suitable employment.
- A qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees.
- An employee with a disability shall be entitled to exemption from tax on all income accruing from his employment.

A person with disability is entitled to exemptions which apply with respect to exemptions and deductions as described in Schedule 42 subsection (2) of the act, among other provisions within this act that should be complied with all parties involved.

4.3.17 The National Gender and Equality Commission Act, 2011

NGEC derives its mandate from Articles 27, 43, and Chapter Fifteen of the Constitution; and section 8 of NGEC Act (Cap. 15) of 2011, with the objectives of promoting gender equality and freedom from discrimination. Gender mainstreaming in road projects ensures that the concerns of women and men form an integral dimension of the project design, implementation, operation and the monitoring and evaluation ensures that women and men benefit equally, and that inequality is not perpetuated.

4.3.18 The Sexual Offences Act, 2006 (amendment 2012)

This is an Act of Parliament that make provision about sexual offences, their definition, prevention and the protection of all persons from harm from unlawful sexual acts, and for connected purposes. Optimum standard work ethic is recommended to ensure persons from both genders are not subjected to sexual offences. Conducive working environment should prevail in workplace in the project, to be enhanced through implementation of a Sexual Misconduct Policy.

4.3.19 Security Laws (Amendment) Act, 2014

This act entails a legal framework and jurisdiction on security matters. It is a constitutional entitlement to live and feel secure from agents that may compromise ones' life and safety. The contractor shall ensure that all workers are safe and secure. It is recommended that the government also takes keen in providing adequate support to enhance the security of persons involved in this project and the community at large.

4.3.20 The Factory and Other Places of Work (Medical Examination) Rules, 2005

This supplementary legislation covers workers who are exposed to specific occupational hazards for the purpose of preventing or controlling occurrence of occupational diseases. In the first schedule of the legislation, works involving risks to healthcare are listed and recommended examinations and their respective intervals are indicated for adherence by employers. Sample requisite certifications are also provided for employers.

4.3.21 The Factory and Other Places of Work (Noise Prevention and Control) Rules, 2005

The Permissible levels of noise in a workplace are provided in section 1-4 of the legislation. While sections 5 and 6 elaborate on the recommended noise prevention program as well as measurement and records to be undertaken by the contracted company during construction and even operational phases of the project.

4.3.22 Land Planning Act Cap 303

This Act make provision for planning the use and development of land. Sub-section 9 of the subsidiary legislation (the development and use of land Regulations 1961) under which it requires that before the local authority submits any plans to the minister for approval, steps should be taken as may be necessary to acquire the owners of any land affected by such plans. Therefore, Particulars of the comments and objections made by the landowners should be

submitted, which intends to reduce conflict of interest with other socio-economic activities. This Act provides the requisite redress mechanisms.

4.3.23 The Lands Act No. 6 of 2012

This is an Act of Parliament that give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land-based resources, and for connected purposes. The Act applies to all land declared as:

- Public land under Article 62 of the Constitution;
- Private land under Article 64 of the Constitution; and
- Community land under Article 63 of the Constitution and any other written law relating to community land.

The Land Act guarantees security of tenure for land under (a) freehold; (b) leasehold; (c) such forms of partial interest as may be defined under the Act and other law, including but not limited to easements; and (d) customary land rights, where consistent with the Constitution and guarantees equal recognition and enforcement of land rights arising under all tenure systems and non-discrimination in ownership of, and access to land under all tenure systems. Under the Lands Act 2012, The Way leaves Act, Cap 292 and The Land Acquisition Act, Cap. 295 have been revoked but Sections 8 and 9 allow for Compulsory Acquisition as an option in acquiring land for public utility. This Act gives the necessary legal and regulatory framework on land acquisition, ownership and tenure issues and as such important for this project.

4.4 International Policy Framework

The republic of Kenya is a party and signatory to international conventions, treaties and protocols relating to the environment which aims at achieving sustainable development. There are 216 treaties, 29 of which are of interest to Kenya (UNEP 1999). Kenya is a signatory to 16 such agreements, which range from use of oil, protection of natural resources and protection of the atmosphere. The agreements are both regional and international and became legally binding on Kenya upon ratification thereof by the rightfully designated Kenyan Authority. The agreements of interest to Kenya can be categorized as those for protecting natural resources, atmosphere and social wellbeing of man.

4.5 World Bank Policies

4.5.1 Operational Policy (OP) 4.01: Environmental Assessment, 2001

World Bank have been in forefront in matters to do with environment and social safeguard. The bank use, Environmental Assessment to identify, avoid, and mitigate the potential negative environmental associated with Bank lending operations. The main purpose of this is to improve decision making, to ensure that project options under consideration are sound and sustainable and that potentially affected people have been properly consulted.

World Bank has already developed 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. These include:

- Identifies and assesses potential risks and benefits based on proposed activities, relevant site features, consideration of natural/human environment, social and transboundary issues;
- Compares environmental pros and cons of feasible alternatives;
- Recommends measures to eliminate, offset, or reduce adverse environmental impacts to acceptable levels (siting, design, technology offsets);
- Proposes monitoring indicators to implement mitigation measures; and
- Describes institutional framework for environmental management and proposes relevant capacity building needs.

4.5.2 Operational Policy 4.12: Involuntary Resettlement

The World Bank policy on involuntary resettlement emphasizes that any development project should avoid or minimize involuntary resettlement and where this is not feasible, it should compensate for lost assets at full replacement cost and assist the 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 proposed project involves improving an existing road and therefore does not require any resettlement of people.

4.5.3 Operational Policy 4.04: Natural Habitats

This policy aims at promoting 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 consider the conservation of biodiversity, as well as the numerous environmental services and products that 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). This project has no significant interaction with natural habitats. The project doesn't fall within areas considered as natural habitats and therefore this policy is not activated.

4.5.4 Operational Policy 4.11: Physical Cultural Resources

The purpose of this policy is to preserve 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. These 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 main purpose of this policy is to avoid or mitigate adverse impacts on physical cultural resources for development projects. The proposed project does not fall within any cultural sites or resources that are likely to be interfered with during the construction process and therefore this policy will not be triggered.

4.5.5 Operational Policy 4.36: Forests protection

This policy aims at achieving the potential of forests to reduce poverty in sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environmental services and values of forests. The main principles of this policy is to screen as early as possible for potential impacts on forest health and quality and on the rights and welfare of the people who depend on them. The proposed project area is dominated with socio-economic activities and therefore no forest resources will be affected or interfered with.

4.5.5 Operational Policy 4.10: Indigenous Peoples

This policy contributes to the Bank's mission of poverty and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies and cultures of indigenous peoples. For all projects that are proposed for Bank financing and affect

indigenous peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consultation. The project area has no indigenous peoples identified.

4.6 Institutional Framework

In Kenya, there are a number of institutions that are important in matters related to environmental management. The following are sections that are relevant to the proposed project.

4.6.1 County Government of Kiambu

County Government of Kiambu is the principle lead agency on matters pertaining to planning within the proposed area. The County Governments' Act (Cap 265) clearly defines the functions of this key institution. Section 166 empowers the count to be responsible for local planning and development control in the region. The Physical Planning Act (Cap 286) also confers upon local authorities the powers to control development in their areas of legal jurisdiction.

The County Environmental Committees contribute to decentralization of activities undertaken by National Environment Management Authority (NEMA). This has enabled local communities to have greater access to environmental management information. It has also enabled the County to conduct quick site visits and review of reports of proposed projects. Since the proposed project is within Kiambu County, the review of the report will be done at the county level for the purpose of issuance of EIA license.

4.6.2 Ministry of Environment and Forestry

This ministry is supposed to monitor, protect, conserve and manage environment and natural resources in Kenya. This shall be achieved through sustainable exploitation of natural resources for socio-economic development geared towards eradication of poverty, improving living standards and maintaining a clean environment for present and future generations. The proposed project will promote the same.

4.6.3 The National Environment Management Authority (NEMA)

NEMA is established under the Environmental Management and Co-ordination Act No. 8 of 1999 (EMCA) as the principal instrument of Government for the implementation of all policies relating to environment. The authority also exercises general supervision and, co-ordination of all matters relating to the environment. NEMA reviews all ESIA project and study reports for the proposed projects, visits the project sites to verify information provided in the report. They

then issue ESIA licenses if it considers that all the issues relevant to proposed projects have been identified and mitigation measures to manage them have been proposed.

4.6.4 The National Environment Council

NEC is established by Section 4(1) of the Environmental Management and Coordination Act no. 8 of 1999. NEC is mandated with the following responsibilities;

- Policy formulation and direction for the purposes of EMCA
- Set national goals and objectives and determine policies and priorities for the protection of the environment; and
- Promote cooperation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes.

4.6.5 The Standards and Enforcement Review Committee (SERC)

SERC is mandated to advise NEMA on the cancellation, revocation and suspension of any EIA license for a period not exceeding 24 months where the licensee has contravened the provisions of the license, e.g. violation of conditions attached to the license. (Section 67 (1), EMCA). The committee through the compliance and enforcement department of NEMA monitors the compliance level of various projects to ensure pollution control standards are implemented. The committee also follows up on pollution complaints reported by the public.

CHAPTER FIVE: PUBLIC CONSULTATION AND PARTICIPATION

5.1 Introduction

Public Participation is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated on the Legal Notice 101 of EMCA 1999 (revised 2015) (The Environmental Regulations, 2003). Stakeholder engagement and public participation process particularly with local resident affected by the proposed development, is frequently interpreted as an integral aspect of successful decision making in the ESIA processes. The essence of public consultation is to ensure that all stakeholder interests are identified and incorporated in project development, implementation and operation. Stakeholder consultations should take place alongside project design and implementation to ensure that the project puts in place measures to cater for stakeholder concerns in all project phases.

5.2 Objectives of the Public Consultation

This section is based upon the principle that local communities have a right to participate in making decisions on matters that have significant effect on the environment. The information obtained from both field visits and public consultations formed the basis for incorporation of public views into this report. The broad objectives of the consultation and public participation are to:

- Identify the social, bio-physical, economic and environmental concerns as perceived by the public.
- Identify the positive and negative impacts that the project should consider.
- Obtain local input into the design of the project, alternatives and mitigation measures of negative impacts of any nature.
- Disseminate and inform the stakeholders about the project with special reference to its key components and location.
- Create awareness among the public on the need for the ESIA for the proposed project.
- Gather comments, suggestions and concerns of the interested and affected parties.
- Incorporate the information collected in the ESIA study.

Further, the process enabled the establishment of a communication channel between the general public and the team of consultants, the project proponents and the Government; and the concerns of the stakeholders to be known to the decision-making bodies at an early phase of project development.

5.2.1 Outcome of the Public Consultation Process

Some of the issues raised during the public consultation process include:

- a) How long the project would take to be completed.
- b) If the road reconstruction and upgrade will include drainage and foot path.
- c) If there would be diversions or alternatives to access the project area during the construction.
- d) If the road upgrade would cause resettlement of the people.
- e) Stakeholders were optimistic that the project would create numerous employment opportunities for both the skilled and the unskilled from the construction phase to the operational phase.

The proposed project doesn't involve any relocation or displacement of the people and if any cases of encroachment are identified, the County Government of Kiambu will use the available legal channels to address them. The study observes that the stakeholders are in support of the project. The questionnaires and interview schedules used during the public consultation process are attached in the annex section of this report.

5.3 Methodology

Various methods of consultation according to target audience were used. This include; interviews with key people, questionnaires, direct interviews and public meetings/fora. The preparatory meeting was held by ESIA team to define and plan how the study will be carried out. Further, a site reconnaissance was held to familiarizes with and appreciate the proposed project area. The following are the detailed public consultation methodology used:

5.3.1 Site Reconnaissance

A Site reconnaissance visit was done by the environmentalist (ESIA/EA lead expert), engineer, sociologist, surveyor, municipal manager and the area chief on 1st October,2019 so as to make preliminary decisions required as to whether or not to proceed with the proposed project to the next stage of investigations.

5.3.2 Direct interview

This was used to get responses from the proponent, opinion leaders within the community, local politicians, county and national government officers representing various departments e.g. land, physical planning, water, environment, gender, culture and social services among

others. Their comments were sought through engaging them in discussions about the proposed project and the impacts likely to occur as a result of its implementation.

5.3.3 Administration of Questionnaires

Questionnaires were developed and administered randomly to avoid bias to affected parties and local people residing along the proposed road project, (filled questionnaires attached).

5.3.4 Social economic survey

Social-economic information of the proposed project area and the affected persons was carried out using the questionnaires. This was conducted by visiting each of the randomly sampled stakeholders.

5.3.5 Public meeting/fora

Public participation forum was held on 1st March 2019, at Kiambu bus park grounds at 11:00 a.m. .Those who attended include; citizen from Ndumberi ward, MCAs, Kiambu Municipal board members, CEC and county staff, (attached minutes, Photos and attendance sheet. Further, Kiambu municipal board member held a meeting on 25th April 2019 to review the projects that were proposed during the Public participation forum to prioritize on the projects to be done in 2019/2020 (minutes attached).

5.4 Positive and Negative Comments made by the Stakeholders

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

Environmental Impacts			
Phase	Positive	Negative	Mitigation measures
Construction	<ul style="list-style-type: none"> • Employment creation 	<ul style="list-style-type: none"> • Dust generation • Implementation may cause devegetation • Likelihood of water pollution • There will be soil erosion • Dumping sites for waste soil are unsightly • There will be noise generation 	<ul style="list-style-type: none"> • Sprinkling water when dusty conditions set in • Conducting a revegetation activity to replace hedges and may trees • Construction of gabions on eroded areas • Designate waste disposal sites that are licensed • Diversion roads should be properly sited • The contractor should provide tree seedlings for planting to the community for free
Operation	<ul style="list-style-type: none"> • There will be reduced generation of dust unlike the current situation • Waste generation from road repair activities will be minimized i.e. soils 	<ul style="list-style-type: none"> • Oil spills from vehicles that are not well maintained • Air pollution from exhaust fumes • Noise pollution from vehicles • It may cause water scarcity • It may cause water borne diseases due to pollution 	<ul style="list-style-type: none"> • Drainage channels should not be directed to the rivers • Reuse of excavated soils • Compensation to the affected people if any

Socio-Economic Impacts			
Phase	Positive	Negative	Mitigation measures
Construction	<ul style="list-style-type: none"> • Employment creation • It helps in increasing market prices for agricultural goods • There will be increase in business rental houses which will spur development • Secondary businesses like food vendors will benefit 	<ul style="list-style-type: none"> • There might be increase in social vices due to new workers coming to the area with increased disposable income • It may lead to spread of diseases i.e. HIV/AIDS • It may cause destruction of property • It may lead to drug abuse i.e. bhang by workers • Social conflicts may arise due to skewed employment 	<ul style="list-style-type: none"> • Youths should be employed in the project • Government intervention when conflicts arise • Contractor should set up a community liaison office in collaboration with the local Chief
Operation	<ul style="list-style-type: none"> • There will be ease of access to transport services • Improved communication between towns • There will be expansion of market for agricultural goods • Transport costs will be lowered • Land values will increase • Pregnant women will access maternity services with ease as well as other community members' health services 	<ul style="list-style-type: none"> • There will be increase in road accidents i.e. from over speeding • There will be increased competition for local resources from outsiders • There will be population increase in local towns which will constrain resources i.e. water 	<ul style="list-style-type: none"> • There should be construction of road bumps on risky places • Installation of speed bumps on risky places • Feeder roads should be constructed to ease transport on the new road • Awareness creation initiatives for community members to reduce conflicts • Pedestrian crossings should be marked

CHAPTER SIX: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

6.1 Introduction

The proposed project will have environmental and social impacts in all phases. This chapter summarizes the likely potential impact both positive and negative at different project cycle stages (construction, operation and decommissioning) and identify potential mitigation measures.

6.2 Negative Impacts during the Construction Phase

The likely negative environmental and social impacts during the construction phase of the proposed project are:

a) Air pollution as result of dust and exhaust emissions

The activities such as excavations and transportation of construction materials will result in the emissions of large amounts of dust within the project site and surrounding areas. During this phase, the contractor will carry out proper and efficient measures wherever and as often as necessary to reduce the dust nuisance resulting from his operations. This will be done through sprinkling water on daily basis on the areas that transport trucks use and excavated areas. The contractor will also provide dust masks to all workers in the project site and ensure more protective gears are available just in case there are visitors.

b) Noise and Vibrations

Noise and vibration will be generated during excavation and construction from heavy machinery in the project area. However, the proponent is expected to take appropriate steps to minimize noise pollution through provision of appropriate personal protective equipment (PPE) to construction workers and visitors, minimizing the frequency of transport of construction materials and ensuring that all construction machinery is well maintained. All work will be carried out with reasonable noise. This effect will also be localized and temporary in duration.

c) Loss of Vegetation Cover

Since the proposed project is an existing road, then there will be minimal or no clearance of vegetation. The proponent is going to ensure that any bare land along the road is covered with vegetation e.g. flowers, grass and trees.

d) Possible water Pollution

There will be increase generation of wastewaters during the construction phase of the project. This will be contributed by oil spillage, disposal practices of used oil, oil filters due to regular

maintenance of heavy trucks and equipment during the construction of the project. Therefore, the contractor needs to carefully handle this type of waste and ensure that the waste is well disposed to avoid any harm to the environment and people residing within the project area.

e) Soil Erosion

Excavation works during the road construction may lead to increased soil erosion at the project site and release of sediments into the drainage systems. Also, where the surface runoff is channeled directly to bare steep slopes with loose soil, it can lead to soil erosion problem. Sediment and erosion from construction activities and storm water runoff may also increase turbidity of surface waters. Uncontrolled soil erosion can have adverse effects on any local water bodies. Therefore, these impacts will be moderated in view of the gentle nature of the landscape through which the road will pass. A well-designed drainage will be constructed to accommodate all the storm water and bare land covered with vegetation e.g. by planting of grass.

f) Extraction and Use of Construction Materials

The project will consume materials such as sand, rough stone, ballast and bitumen. These materials will be obtained from quarries and bitumen dealers respectively. The availability and sustainability of such materials or resources will thus be negatively affected, as they are not renewable in the short term. The sites from which these materials are extracted may be significantly affected in various ways including dereliction, landscape changes, destruction of vegetation, poor visual quality and opening of depressions on the surface leading to human health impacts. These impacts shall be addressed as recommended in ESMP.

g) Solid Waste Generation

Solid waste will be generated at the site during construction of the road and related infrastructure. Such waste will consist of excavated materials, vegetation waste from the clearance of road reserves, sludge from storm-water drainage system, metal drums, rejected materials, surplus materials, surplus spoils, empty cartons, waste oil, and waste bitumen, among others. This may be emphasized by the fact that some of the waste materials contain hazardous substances such as waste oil, solvents, while some of the waste materials including metal cuttings and plastic containers are not biodegradable and can have long-term and cumulative effects on the environment. Stored materials may also generate waste in form of oil spills from storage tanks, filling platforms and transfer tanks. Therefore, the proponent would need to ensure that all solid wastes are collected and disposed appropriately in order to promote a clean and healthy environment along the project area, a storm-water management plan that has been

provided in this report should be adhered to. The contractor shall comply with recommendations provided in the ESMP.

h) Increased Water Use

The construction activities will require large quantities of water mainly be used for concrete mixing, dust suppression and sanitary and washing purposes. Excessive water use may negatively impact on the water source and its sustainability.

i) Generation of storm water and impact on drainage

The proposed road project will increase the amount of impermeable surface area that will end up increasing the rate of surface water runoff. The increased runoff could overwhelm local drainage system with potential for flooding, damage to property and crops. Flooding downstream can also become a health hazard by providing breeding ground for mosquitos. Therefore, good drainage design and construction in the development of roads is critical to the success of road construction. Also, storm water generated on the road may be contaminated with oil and grease, metals (e.g. lead, zinc, copper, cadmium, chromium, and nickel), particulate matter and other pollutants released by vehicles on the highway. Storm water may also contain nutrients and herbicides used for management of vegetation in the rights-of-way. This impact will be moderate to avoid any damage or harm within and around the project.

j) Road Safety

It is envisaged that with the improvement of the project road, the traffic volumes and speeds will increase, and composition will change. This will cause increased frequency and severity of accidents. In order to reduce accidents, appropriate road signs and road markings to be put in locations where standards are compromised to warn drivers of safety hazards especially while approaching bends, junctions, schools and churches.

6.3 Negative Socio- Economic Impacts during Construction Phase

i) Community Health and Safety

The proposed project will have impact on the community health and safety. This include dust, noise, and vibration from construction vehicles, and communicable disease associated with the influx of temporary construction labor. Key issues associated with this road project will include pedestrian and traffic safety, and emergency preparedness. Pedestrians, motor cyclists and children are at greatest risk of serious injury from collisions with moving vehicles. Some of the

factors that contribute to traffic accidents include; poor driving skills, vehicle that not road worth, poor road design, among other issues. The proponent shall ensure the right road designs are developed, road signs are well place, quality vehicles are in place and skilled drives are recruited.

ii) Disruption of Businesses

There will be temporary economic disruption to the residents during construction phase. Some of them own small-scale shops while others are small scale farmers. They will not be displaced but their customers may reduce in numbers due to accessibility issues. To address this, the contractor will provide alternative access route and source of income i.e. employment.

iii) Temporary Employment issues

The road improvement project will require large numbers of casual labour. However, if the locals feel that the contractor has not considered them for these jobs, they might antagonize the project leading to delays in completion.

iv) Occupational Health Safety Hazards

The construction and operation phase of the proposed road will lead to various OHS hazards. During road construction, operations, and maintenance activities workers will be exposed to chemical hazards associated with exposures to road construction materials, dust during construction; exhaust emissions from heavy equipment and motor vehicles. On the other hand, workers may also be exposed to physical hazard from operating machinery and moving vehicles, exposure to weather elements, noise, work in confined spaces, trenching, contact with overhead power lines, falls from machinery or structures, and risk of falling objects.

v) Insecurity

There were concerns that due to an influx of many people as construction workers at the project, insecurity is likely to increase. This is a low risk which shall be addressed by the security agencies both from county and national government. The contractor will also engage a security firm to take care of the machinery at any given time.

vi) Interference to road use activities due to diversions and closures

During construction, there will be instances where diversions/ closures/ barriers will have to be put in place to allow construction work to continue with minimum interference by other road users. The closures/ barricades may obstruct access routes to people's homes, businesses etc.

The contractor will ensure prompt road signs with the right information is put in place appropriately. Alternative road will be provided to ensure residents access their homes, businesses, schools and any other social amenity.

vii) Spread HIV and AIDS

There is risk of spread of sexually transmitted diseases e.g. HIV/AIDS to workers and other persons during project implementation. This is as result of increased incomes of workers as well as some of the contractor workers being away from their homes. The project proponent will need to work jointly with appropriate county and national government health agencies in order to come with a comprehensive STD, HIV and AIDs control programme during the construction and operational phases of the project.

6.4 Positive Impacts during the Construction Phase

a) Creation of Employment Opportunities

The road project is labour intensive especially during the construction phase. The project will provide employment opportunity to both skilled and unskilled people. This is a significant impact given that the rate of unemployment in Kiambu municipality and the surrounding areas is quite high. These jobs are expected to improve the economy of the area and improve the livelihoods of the local people.

b) Market Opportunities in Procurement and Supply of Materials

The proposed road project requires a lot of materials ranging from cement, quarry chips, sand etc. The contractor will be encouraged to purchase most of these materials from the local suppliers and only when necessary without the project area. This will promote the economy of the project area.

c) Improved Security

The proposed road project will lead to an improvement of security and enhance the local economy. There will good security mechanisms employed during construction. Road patrols will also be conducted frequently thereby improving the security of the area.

d) Increased Business Opportunities

The large number of project workers required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as food vendors around the construction site.

e) Transfer of Skills

This road project will employ many people from within and without the area to provide different services. As such, the local people will learn new skills from the civil engineers, welders, masons and other employees that come from outside.

6.5 Negative Impacts during the Operational Phase

i) Increased Storm Water Flow

The paved areas will likely lead to an increase in volume and velocity of storm water or run-off flowing across the area covered by the roads. This will lead to increased amounts of storm water entering the drainage systems, resulting in overflow and damage to such systems in addition to increased erosion or water logging in the neighboring areas if not adequately mitigated.

ii) Generation of Solid Waste

Operation and maintenance activities are expected to generate waste from road litter, illegally dumped waste, vegetation waste from the clearance of road reserves and sediment and sludge from storm water drainage system. The proponent would need to ensure that all solid wastes are collected and disposed appropriately in order to promote a clean and healthy environment along the road.

iii) Possible Risks of Road Accidents

It is expected that vehicles using this road will tend to move at high speed due to improved road from gravel to bituminous standards. Present of pedestrians, children and other road users within the project area may lead to increased accidents. Road bumps, rumble strips and signage need to be provided throughout the road length and especially near public institutions.

iv) Increased Population and Congestion

The upgrade of the road to bituminous standard is likely to attract more people into the area either as tenants or business people. This is likely to cause congestion and increase demand for resources such as water, sewerage and drainage facilities.

v) Noise Pollution and Excessive Vibrations

Noise will be experienced during this operation stage of the project due to high speed and raving of motor vehicles along the road.

vi) Storm Water and Impact on Drainage

Tarmacked road increases the amount of impermeable surface area, which increases the rate of surface water runoff flow. The project will also impact on the drainage during the operational phase of the road. There will be increased generation of surface runoff on the road. The increased or excess runoff could overwhelm local drainage system including streams with potential for increasing downstream flooding, damage to properties. Good drainage design and construction in the development of roads is critical to the success of road construction. The storm-water management plan specified in this report should be observed.

6.6 Positive Impacts during Operational Phase**a. Efficient and reliable Means of Transport**

During the data field visit, most stakeholders were positive that the proposed road project will provide a faster and cheaper means of transport from Ndumberi town to the neighbouring town center and villages. During the rainy season the road is rendered impassable due to floods hence improving it up to bituminous standards will address this problem.

b. Reduction in Dust Emissions

By improving the proposed gravel road to bituminous standards will help reduce dust emissions especially during the dry weather conditions. This will reduce dust related health issues.

c. Enhanced Socio-Economy

Stakeholders who were interviewed acknowledged that the proposed road will contribute immensely to the development of business at the Ndumberi town and nearby trading centers around the project area. The implementation of the project will result in the improvements of the living conditions of population living along the road thus contributing to poverty reduction. The land value within the project area will appreciate due to improve infrastructure.

d. Creation of Employment Opportunities

During the operation phase, employment opportunities will emerge. Some people will be employed for the normal and continuous road maintenance whereas others will establish roadside businesses e.g. small shops along the road.

e. Improved Road Safety

By provision of foot path, well-marked road with right signage will make the road user friendly to both human and vehicles.

6.7 Negative Impacts during Decommissioning Phase

i. Noise and vibration

Noise and vibration will be experienced from vehicles and machines that will be used during the decommissioning phase.

ii. Solid waste generation

Waste generated during this phase includes materials used during construction including concrete, tarmac, metal, Kerbs, bitumen, stones and ballast. Decommissioning may also involve demolition works which generates large amounts of solid waste.

iii. Reduced or loss of positive impacts to the project

Most of the people who were employer during the construction and operation stage will lose employment during decommissioning stage. Other positive impacts that will be accrued during the operation phase like fast movement of goods and services, cheaper transportation etc. will also be reduced.

iv. Dust emission

Dust will be emitted by moving vehicles and from the decommissioning works through digging and excavating of the tarmac surface.

6.8 Positive Impacts during Decommissioning Phase

i) Creation of Temporary Employment

The employment opportunities that will be created during decommissioning will benefit the local people.

CHAPTER SEVEN: MITIGATION MEASURES

7.1 Introduction

The upgrading of the proposed road project will have various impacts on biophysical environmental, health and safety of employees and members of public, and socio-economic well-being of the local communities and households. It is usually impossible to mitigate all the expected negative environmental and social impacts. Therefore, this section highlights the requisite mitigation measures that should be adopted to prevent or minimize significant negative environmental, health and safety impacts associated with the activities of the project during its construction, operation and decommissioning phases. It further ensures that, positive benefits of the project are maximized.

The mitigation measures will be presented in the Environmental and Social Management Plan (ESMP), that is intended to assist the proponent in the management of the adverse environmental impacts associated with the life cycle of the project.

7.2 Mitigation Measures for Impacts during Construction Phase

Mitigating air pollution as result of dust and exhaust emissions

- Sprinkling of water on dry and dusty surfaces regularly including the access roads and diversion routes.
- Add suitable soil stabilizers on access roads or pave access roads to control dust.
- Collecting storm water and use to de-dust the construction site and the all-weather access roads if volumes stored are enough.
- Comply with personal protective equipment requirement for dusty areas such as dust masks and protective glasses.
- Re-vegetating exposed areas during the operation phase of the project.
- Slowing the speed of traffic by using bumps and/ or clearly marked road signs may contribute to reducing dust levels. Also enforce onsite speed limit regulations.
- Dust control mechanisms at the gravel borrow sites through extraction in wet conditions and transport in covered trucks.
- Covering heaps and berms of soil.
- Adhere to the Environmental Management and Co-ordination (Air Quality) Regulations, 2014.
- Procure machines, equipment and vehicles which are environmentally friendly

- Ensure machines and vehicles are properly and regularly maintained and have the requisite inspection certificate.
- Limit construction traffic movement and operations to the most necessary activities through adequate planning.
- Adhere to the Environmental Management and Co-ordination, Fossil Fuel Emission Control Regulations 2006.

Mitigating Noise and Vibrations

- Sensitize drivers of construction vehicles and machinery operators to switch off engines or machinery that are not being used.
- Ensure that all vehicles and construction machinery are kept in good condition throughout to avoid excessive noise generation.
- Ensure that all workers wear earmuffs and other personal protective gear/equipment when working in noisy sections.
- Undertake loud noise and vibration level activities during off-peak hours during the day (i.e. between 8.00 am and 5.00 pm).
- Acquire Noise and Excessive Vibrations Pollution Control Permit and comply with conditions provided by the EMCA (Noise and Excessive Vibrations Pollution Control) Regulations 2009.
- Support facilities such as hard rock quarries should adopt controlled blasting techniques, preventing flying rock debris and high intensity vibrations.
- Blasting within the road project site should be done during the day and the public should be properly informed of the activity in time. Should adopt controlled blasting techniques, preventing flying rock debris and high intensity vibrations. The management should equally observe relevant explosives use and blasting permits provided by the Inspector of Mines and Geology.

Mitigating Loss of Vegetation Cover

- Minimize clearing and disruption of existing vegetation.
- Provide adequate protection against scour and erosion and consider the onset of the rainy season with respect to construction schedules.
- Employ vegetation rehabilitation techniques to recover lost plant cover such as tree, grass and flowers planting.

Mitigating Possible water Pollution from Waste Oils and Spares Parts

- The contractor should have a machinery and vehicle maintenance area as well as sealed area for the storage of pollutants to avoid any accidental discharge that would pollute water resources.
- Oil-water interceptors or sumps should be constructed to capture discharge of oils and other polluting liquids from maintenance workshop, vehicle and equipment washing bays.
- Measures should be taken to ensure proper storage of fuel, oil and bitumen.
- Oil pollution should be prevented by ensuring proper storage, handling and disposal of oil and oil wastes.
- The Contractor must as well adhere to Water Quality Regulations, 2006.

Minimizing increased Soil Erosion

- Ensure surface runoff generated on impervious surface is not channeled directly to steep slopes.
- Construct flow breaks on roadside drainage channels.
- Promote harvesting of surface runoff.

Minimizing Extraction and Use of Construction Materials

- The contractor is expected to comply with the National Sand Harvesting guidelines provided by NEMA and the County Governments.
- The contractor should only order for what will be required through accurate budgeting and estimation of actual construction requirements.
- The contractor should ensure that wastage, damage or loss (through run-off, wind, etc.) of materials at the construction site is kept minimal.
- The contractor shall consider reuse of construction materials and use of recyclable materials.

Minimizing Solid Waste Generation

- Maximizing the rate of recycling of road resurfacing waste either in the aggregate or as a base;
- Incorporating recyclable materials (e.g. glass, scrap tires, certain types of slag and ashes) to reduce the volume and cost of new asphalt and concrete mixes;
- Collecting road litter or illegally dumped waste and managing it according to the recommendations in the General EHS Guidelines and Waste Management Regulations, 2006;

- Obsolete products should be managed as a hazardous waste as described in the General EHS Guidelines;
- Composting of vegetation waste for reuse as a landscaping fertilizer;
- Managing sediment and sludge removed from storm drainage systems maintenance activities as a hazardous or non-hazardous waste based on an assessment of its characteristics;
- Develop and implement a Construction Waste Management Plan before start of the project;
- Drainage outfalls should be properly constructed to reduce the erosion from surface runoff and storm water; and
- Comply with provisions of the EMCA, Waste Management Regulations 2006.

Minimizing Increased Water Use

- Harvest surface runoff for use to suppress dust.
- Comply with Water Resources Authority Requirements as stipulated in the Water Act, 2016.

Minimizing Generation of storm water and impact on drainage

- Use of storm water management practices that slow peak runoff flow, reduce sediment load, and increase infiltration.
- Regular inspection and maintenance of permanent erosion and runoff control features.
- Paving in dry weather to minimize runoff of asphalt or cement materials.

Minimizing Increased Loss of Human Life due to Road Accidents

- Construct pedestrian crossing points in certain key areas.
- Inclusion of road bumps and signage in certain key areas.
- Adopt strict policing to ensure that there is no over speeding along the road.

Mitigating Socio- Economic Impacts during Construction Phase

Minimizing negative Community Health and Safety impacts

- Implement pedestrian safety management strategies such as provision of safe side road along the road alignment and construction areas both during construction and operation.
- Installation of barriers (e.g. guardrails etc.) to deter pedestrian access to the roadway except at designated crossing points.
- Installation and maintenance of speed control and traffic calming devices at pedestrian crossing areas.
- Ensure health and safety measures as proposed in the ESMP apply to the letter for quarrying and earth borrowing activities.

- Installation and maintenance of all signs, signals, markings, and other devices used to regulate traffic, including posted speed limits, warnings of sharp turns, or other special road conditions.
- Targeting elimination of accidents rail crossings by use of a real-time warning system with signage to warn drivers of congestion, accidents, adverse weather or road conditions, and other potential hazards ahead.
- Prepare an emergency preparedness and response plan in coordination with the local community and local emergency responders to provide timely first aid response in the event of accidents and hazardous materials response in the event of spills.
- Ensure there is adequate wastewater disposal system to avoid breeding of malaria parasite transmitting mosquitos. Proper disposal of wastewater to minimize contamination of water supplies with typhoid causing organisms.

Mitigating Disruption of Businesses

- Provide comprehensive health and safety education to residents in the project area.
- Provision of employment in the project for the local people where possible.
- Put in place a grievance redress mechanism

Minimizing Temporary Employment issues

- Provision of employment in the project for the local people where possible.

Mitigating Occupational Health Safety Hazards

- Develop and enforce a fleet management plan for road construction that includes measures to ensure work zone safety for construction workers and the public members.
- Establishment of work zones to separate pedestrians walking from vehicular traffic and equipment by routing of traffic to alternative roads where possible.
- Use protective barriers to shield pedestrians from traffic vehicles, regulation of traffic flow by warning lights, or flaggers, design of the workspace to eliminate or decrease blind spots and ensure reduction of maximum vehicle speeds in work zones.
- Training of workers in safety issues related to their activities, such as the hazards of working on foot around equipment and vehicles.
- Ensure safe practices for work at night and in other low-visibility conditions, including use of high-visibility safety apparel and proper illumination for the workspace (while controlling glare so as not to blind workers and passing motorists).

- Barricade the area around which elevated work is taking place to prevent unauthorized access.
- Hoisting and lifting equipment should be rated and properly maintained, and operators trained in their use.
- Elevating platforms should be maintained and operated according to established safety procedures including use of fall protection measures (e.g. railings).
- Use of the correct asphalt product for each specific application and ensuring application at the correct temperature to reduce the fuming of bitumen during normal handling.
- Maintenance of work vehicles and machinery to minimize air emissions.
- Reduction of engine idling time in construction sites; Use of extenders or other means to direct diesel exhaust away from the operator.

Minimizing Insecurity

- Thoroughly screen of workers, suppliers and distributors.
- Ensure 24-hour surveillance by engaging the security firm during the day and night.
- Ensure close liaison with the local Police Department.

Mitigating Interference to road use activities due to diversions and closures

- Provide opening or crossing points in road barriers to allow crossing of pedestrians
- Provide access roads linking key places in affected area.
- Erect road signs with clear information especially for diversion

Mitigating Spread HIV and AIDS

- Develop a comprehensive STDS, HIV and AIDS awareness and control programmes such as provision of condoms to workers both male and female.
- Provision of STDs, HIV and AIDS prevention measures to workers.
- Creation of awareness of STDs, HIV/AIDS in workers through trainings and installation of posters.
- Adhere to and implement the Sexual Offences Act, 2006 and its amendment 2012.

7.3 Mitigation of Impacts during the Operation Phase

Minimizing Increased Storm Water Flow

- Use of storm water management practices that slow peak runoff flow, reduce sediment load and increase infiltration.
- Regular inspection and maintenance of permanent erosion and runoff control features.

Minimizing Generation of Solid Waste

- Ensure that all solid wastes are collected and disposed appropriately in order to promote a clean and healthy environment along the road.

Mitigating Possible Risks of Road Accidents

- Provide Road bumps, rumble strips and signage throughout the road length and especially near public institutions.

Mitigating Increased Population and Congestion related issues

- Establish well designed drainage system that will ensure all storm water is collected to avoid flooding.
- Water and sewerage systems should be established in the project area to accommodate the new migrants.

Mitigating Noise Pollution and Excessive Vibrations

- Enforcement of Traffic Act regulations to ensure that all vehicles using the road are in good condition all the time to avoid excessive noise generation.
- Install speed control measures such as bumps and ramble strips in the areas there are institutions e.g. school, churches etc.
- Install no hooting signs in sensitive areas i.e. near schools etc.

7.4 Mitigation of Impacts during the Decommissioning Phase

Minimizing Noise and vibration

- Significant impacts on the acoustic environment will be mitigated as described above.

Minimizing Solid waste generation

- Solid waste resulting from demolition or dismantling works will be managed as described above.

Mitigating Dust emission

- High levels of dust concentration resulting from demolition or dismantling works will be minimized as described earlier.

CHAPTER EIGHT: ANALYSIS OF PROJECT ALTERNATIVES

8.1 Introduction

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

8.2 Alternative Location

The location for the project is the best suited as it only involves an upgrading. During the stakeholder's consultation and field visit, it was noted that no alternative route is preferred to the existing proposed route. Relocating the project to another area would require lots of planning, resources to compensate those that might be relocated, and a lot of time might be spent in the planning and acquisition of alternative land. The proposed location is thus the best suited for the project.

8.3 Solid Waste Management Alternatives

There will be generation of solid waste from the proposed project. An integrated solid waste management system is recommendable. First, the proponent will give priority to reduction at source of the waste materials. This option will demand a solid waste management awareness programme in the management and the workers. Notices for proper waste management/handling may be posted at strategic places for the sake of visitors in the project site. Secondly, Recycling, Reuse and compositing of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The recyclables will be sold to waste buyers within County. The third priority in the hierarchy of options is combustion of the waste that is not recyclable. Finally, sanitary land filling will be the last option for the proponent to consider.

8.4 The No Project Alternative

The **No Project Alternative** with respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. This option will, however, involve several losses both to the county and the community at large. Transport, access and connectivity into Ndumberi town will continue to be hampered. The **No Project Option** is the least preferred from the socio-economic and partly environmental perspective due to the following factors:

- Provide services to the residents of Ndumberi town and neighbouring villages will continue to be inefficient.
- Access and connectivity to the project area and to Ndumberi town as well as to the neighbouring villages will continue to be a challenge due to the poor nature of the roads.

- The economic status of the users and the local people would remain unchanged.
- The project area will continue to be appealing.
- There will be no employment opportunities created for Kenyans who will work in the project area and along the proposed road.
- Increased urban poverty and crime in Kenya.
- Discouragement for investors and loaners
- Development of infrastructural facilities will not be undertaken.

8.5 Analysis of Alternative Construction Materials and Technology

The proposed road project will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment that saves energy and water will be given priority without compromising on cost or availability factors. The road will be upgraded using locally sourced stones, cement and bitumen that meets the requirements of the Kenya Bureau of Standards (KEBS). The alternative technologies available include the conventional concrete, prefabricated concrete panels, or even temporary structures. These may not be desirable from a cost and durability perspective. The technology to be adopted will be the most economical and one sensitive to the environment.

CHAPTER NINE: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

9.1 Introduction

The ESMP for the proposed projects is used to provide a logical framework within which identified negative environmental and social impacts can be avoided, mitigated and monitored. The ESMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done. The ESMP is a crucial output of an ESIA as it provides a checklist for project monitoring and evaluation. The ESMP outlined below will address the identified potential negative impacts and mitigation measures of the Project based on the chapters on Environmental and Social Impacts and Mitigation Measures of the Negative Impacts.

9.2 Mandate of the Proponent

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

Proponent responsibilities;

- Shall hand over the site to the Contractor for implementation of the project.
- Will fund the project.
- Will acquire the NEMA license.
- Will supervise the project and will also ensure its satisfactory implementation.
- Shall ensure that there is a functional stakeholder engagement plan and grievance redress mechanism.
- Shall define the area of the site, which may be occupied by the contractor for use as storage, on the site.
- Shall include all recommendations from ESIA into the contract.

9.3 Mandate of the Contractor

These will include but not limited to;

- Prepare and maintain an approved time and progress work-plan, indicating clearly the period allowed for each section of the work.
- Shall comply with all regulations and by-laws of the local authority including serving of notices and paying of the fees.

- Shall provide at his own risk, and cost all water required for use in connection with the works
- Shall take all possible precautions to prevent nuisance, inconvenience or injury to the neighboring properties and to the public generally, and shall use proper precaution to ensure the safety of wheeled traffic and pedestrian
- All work operations which may generate noise, dust, vibrations, or any other discomfort to the workers and/or guests of the client and the neighbors must be undertaken with care, with all necessary safety precautions taken.
- Shall upon completion of working, remove and clear away all plant, rubbish and unused materials and shall leave the whole site in a clean and tidy state to the satisfaction of the Proponent. He shall also remove from the site all rubbish and dirt as it is produced to maintain the tidiness of the premises and its immediate environs.
- The standard of workmanship shall not be inferior to the Kenya Bureau of Standards and/or codes of practice where existing.
- Shall maintain good working relationship with the community and implement the stakeholder engagement plan and the grievance redress mechanism.

All these responsibilities shall be reviewed carefully against the contract documentation to ensure that they are included in the contract documentation.

The ESMP for all project phases has been outlined to cover; Design and construction Phase, Operation Phase and Decommissioning Phase.

The following ESMP tables forms the core of this ESMP for the construction, operational and decommissioning phases of the proposed road project. The following tables details all necessary mitigation measures as well as the person responsible for implementing and monitoring such measures. The tables should be used as checklist on site. Due to the magnitude of the project, compliance with the ESMP must be monitored periodically and reports prepared and provided at monthly site meetings during the construction phase and quarterly during the operations and maintenance period as required in EMCA 1999. Annual audits will be conducted during both the construction, operation and maintenance phases.

ESMP for the Upgrading of 1.5km Githunguri-Gatitu-Githiga road to bituminous standards

POTENTIAL IMPACTS	MITIGATION MEASURES	RESPONSIBILITY	MONITORING FREQUENCY	BUDGET
NEGATIVE IMPACTS DURING CONSTRUCTION PHASE				
Air pollution as result of dust and exhaust emissions	<ul style="list-style-type: none"> • Sprinkling of water on dry and dusty surfaces regularly including the access roads and diversion routes. • Add suitable soil stabilizers on access roads or pave access roads to control dust. • Collecting storm water and use to de-dust the construction site and the all-weather access roads if volumes stored are enough. • Comply with personal protective Equipment requirement for dusty areas such as dust masks and protective glasses. • Re-vegetating exposed areas during the operation phase of the project. • Slowing the speed of traffic by using bumps and/ or clearly marked road signs may contribute to reducing dust levels. Also enforce onsite speed limit regulations. • Dust control mechanisms at the gravel borrow sites through extraction in wet conditions and transport in covered trucks. • Covering heaps and berms of soil. • Adhere to the Environmental Management and Co-ordination (Air Quality) Regulations, 2014. • Procure machines, equipment and vehicles which are environmentally friendly 	Contractor/Proponent	Continuous	100,0000

	<ul style="list-style-type: none"> • Ensure machines and vehicles are properly and regularly maintained and have the requisite inspection certificate. • Limit construction traffic movement and operations to the most necessary activities through adequate planning. • Adhere to the Environmental Management and Co-ordination, Fossil Fuel Emission Control Regulations 2006. 			
<p>Noise and Vibrations</p>	<ul style="list-style-type: none"> • Sensitize drivers of construction vehicles and machinery operators to switch off engines or machinery that are not being used. • Ensure that all vehicles and construction machinery are kept in good condition throughout to avoid excessive noise generation. • Ensure that all workers wear earmuffs and other personal protective gear/equipment when working in noisy sections. • Undertake loud noise and vibration level activities during off-peak hours during the day (i.e. between 8.00 am and 5.00 pm). • Acquire Noise and Excessive Vibrations Pollution Control Permit and comply with conditions provided by the EMCA (Noise and Excessive Vibrations Pollution Control) Regulations 2009. • Support facilities such as hard rock quarries should adopt controlled blasting techniques, preventing flying rock debris and high intensity vibrations. 	<p>Continuous/proponent</p>	<p>Contractor</p>	<p>50,000</p>

<p>Loss of Vegetation Cover</p>	<ul style="list-style-type: none"> • Minimize clearing and disruption of existing vegetation. • Provide adequate protection against scour and erosion; and consider the onset of the rainy season with respect to construction schedules. • Employ vegetation rehabilitation techniques to recover lost plant cover such as tree, grass and flowers planting. 	<p>Contractor/proponent</p>	<p>Continuous</p>	<p>40,000</p>
<p>Possible water Pollution</p>	<ul style="list-style-type: none"> • The contractor should have a machinery and vehicle maintenance area as well as sealed area for the storage of pollutants to avoid any accidental discharge that would pollute water resources. • Oil-water interceptors or sumps should be constructed to capture discharge of oils and other polluting liquids from maintenance workshop, vehicle and equipment washing bays. • Measures should be taken to ensure proper storage of fuel, oil and bitumen. • Oil pollution should be prevented by ensuring proper storage, handling and disposal of oil and oil wastes. • The Contractor must as well adhere to Water Quality Regulations, 2006. 	<p>Contractor/proponent</p>	<p>Continuous</p>	<p>40,000</p>
<p>Soil Erosion</p>	<ul style="list-style-type: none"> • Ensure surface runoff generated on impervious surface is not channeled directly to steep slopes. • Construct flow breaks on roadside drainage channels. • Promote harvesting of surface runoff. 	<p>Contractor/proponent</p>	<p>Continuous</p>	<p>80,000</p>

<p>Extraction and Use of Construction Materials</p>	<ul style="list-style-type: none"> • The contractor is expected to comply with the National Sand Harvesting guidelines provided by NEMA and the County Governments. • The contractor should only order for what will be required through accurate budgeting and estimation of actual construction requirements. • The contractor should ensure that wastage, damage or loss (through run-off, wind, etc.) of materials at the construction site is kept minimal. • The contractor shall consider reuse of construction materials and use of recyclable materials. 	<p>Contractor/proponent/NEMA</p>	<p>Continuous</p>	<p>60,000</p>
<p>Solid Waste Generation</p>	<ul style="list-style-type: none"> • Maximizing the rate of recycling of road resurfacing waste either in the aggregate or as a base; • Incorporating recyclable materials (e.g. glass, scrap tires, certain types of slag and ashes) to reduce the volume and cost of new asphalt and concrete mixes. • Collecting road litter or illegally dumped waste and managing it according to the recommendations in the General EHS Guidelines and Waste Management Regulations, 2006. • Obsolete products should be managed as a hazardous waste as described in the General EHS Guidelines. • Composting of vegetation waste for reuse as a landscaping fertilizer. • Managing sediment and sludge removed from storm drainage systems maintenance activities as 	<p>Contractor/Proponent</p>	<p>Continuous</p>	<p>30,000</p>

	<p>a hazardous or non-hazardous waste based on an assessment of its characteristics.</p> <ul style="list-style-type: none"> • Develop and implement a Construction Waste Management Plan before start of the project. • Drainage outfalls should be properly constructed to reduce the erosion from surface runoff and storm water. • Comply with provisions of the EMCA, Waste Management Regulations 2006. 			
Increased Water Use	<ul style="list-style-type: none"> • Harvest surface runoff for use to suppress dust. • Comply with Water Resources Authority Requirements as stipulated in the Water Act, 2016. 	Contractor/WRA	Continuous	30,000
Generation of storm water and impact on drainage	<ul style="list-style-type: none"> • Use of storm water management practices that slow peak runoff flow, reduce sediment load, and increase infiltration. • Regular inspection and maintenance of permanent erosion and runoff control features. • Paving in dry weather to minimize runoff of asphalt or cement materials. 	Contractor/Proponent	Continuous	70,000
Road Safety	<ul style="list-style-type: none"> • Construct pedestrian crossing points in certain key areas. • Inclusion of road bumps and signage in certain key areas. • Adopt strict policing to ensure that there is no over speeding along the road. 	Contractor/proponent	Continuous	50,000
Community Health and Safety	<ul style="list-style-type: none"> • Implement pedestrian safety management strategies such as provision of safe side road along the road alignment and construction areas both during construction and operation. 	Contractor/proponent	Continuous	50,000

	<ul style="list-style-type: none"> • Installation and maintenance of speed control and traffic calming devices at pedestrian crossing areas. • Installation and maintenance of all signs, signals, markings, and other devices used to regulate traffic, including posted speed limits, warnings of sharp turns, or other special road conditions. • Targeting elimination of accidents rail crossings by use of a real-time warning system with signage to warn drivers of congestion, accidents, adverse weather or road conditions, and other potential hazards ahead. • Prepare an emergency preparedness and response plan in coordination with the local community and local emergency responders to provide timely first aid response in the event of accidents and hazardous materials response in the event of spills. • Ensure there is adequate wastewater disposal system to avoid breeding of malaria parasite transmitting mosquitos. Proper disposal of wastewater to minimize contamination of water supplies with typhoid causing organisms. • Ensure health and safety measures as proposed in the ESMP apply to the letter for quarrying and earth borrowing activities. 			
<p>Disruption of Businesses</p>	<ul style="list-style-type: none"> • Provide comprehensive health and safety education to residents in the project area. 	<p>Contractor/proponent</p>	<p>Continuous</p>	

	<ul style="list-style-type: none"> • Provision of employment in the project for the local people where possible. • Put in place a grievance redress mechanism 			As per BOQ
Temporary Employment issues	<ul style="list-style-type: none"> • Provision of employment in the project for the local people where possible. 	Contractor/proponent	Continuous	As per BOQ
Occupational Health Safety Hazards	<ul style="list-style-type: none"> • Develop and enforce a fleet management plan for road construction that includes measures to ensure work zone safety for construction workers and the public members. • Establishment of work zones to separate pedestrians walking from vehicular traffic and equipment by routing of traffic to alternative roads where possible. • Use protective barriers to shield pedestrians from traffic vehicles, regulation of traffic flow by warning lights, or flaggers, design of the workspace to eliminate or decrease blind spots and ensure reduction of maximum vehicle speeds in work zones. • Training of workers in safety issues related to their activities, such as the hazards of working on foot around equipment and vehicles. • Ensure safe practices for work at night and in other low-visibility conditions, including use of high-visibility safety apparel and proper illumination for the workspace (while controlling glare so as not to blind workers and passing motorists). • Barricade the area around which elevated work is taking place to prevent unauthorized access. 	Contractor/proponent	Continuous	40,000

	<ul style="list-style-type: none"> • Hoisting and lifting equipment should be rated and properly maintained, and operators trained in their use. • Elevating platforms should be maintained and operated according to established safety procedures including use of fall protection measures (e.g. railings). • Use of the correct asphalt product for each specific application and ensuring application at the correct temperature to reduce the fuming of bitumen during normal handling. • Maintenance of work vehicles and machinery to minimize air emissions. • Reduction of engine idling time in construction sites; Use of extenders or other means to direct diesel exhaust away from the operator. 			
Insecurity	<ul style="list-style-type: none"> • Thoroughly screen of workers, suppliers and distributors. • Ensure 24-hour surveillance by engaging the security firm during the day and night. • Ensure close liaison with the local Police Department. 	Contractor/proponent/security agencies	Continuous	100,000
Interference to road use activities due to diversions and closures	<ul style="list-style-type: none"> • Provide opening or crossing points in road barriers to allow crossing of pedestrians • Provide access roads linking key places in affected area. • Erect road signs with clear information especially for diversion 	Contractor	Continuous	100,000
Spread HIV and AIDS	<ul style="list-style-type: none"> • Develop a comprehensive STDS, HIV and AIDs awareness and control programmes such 	Contractor/proponent	Continuous	70,000

	<p>as provision of condoms to workers both male and female.</p> <ul style="list-style-type: none"> • Provision of STDs, HIV and AIDS prevention measures to workers. • Creation of awareness of STDs, HIV/AIDS in workers through trainings and installation of posters. • Adhere to and implement the Sexual Offences Act, 2006 and its amendment 2012. 			
NEGATIVE IMPACTS DURING THE OPERATIONAL PHASE				
Increased Storm Water Flow	<ul style="list-style-type: none"> • Use of storm water management practices that slow peak runoff flow, reduce sediment load and increase infiltration. • Regular inspection and maintenance of permanent erosion and runoff control features. 	Proponent	Continuous	40,000
Generation of Solid Waste	<ul style="list-style-type: none"> • Ensure that all solid wastes are collected and disposed appropriately in order to promote a clean and healthy environment along the road. 	Proponent	Continuous	40,000
Possible Risks of Road Accidents	<ul style="list-style-type: none"> • Provide Road bumps, rumble strips and signage throughout the road length and especially near public institutions. 	Proponent	Continuous	As per BOQ
Increased Population and Congestion	<ul style="list-style-type: none"> • Establish well designed drainage system that will ensure all storm water is collected to avoid flooding. • Water and sewerage systems should be established in the project area to accommodate the new migrants. 	Proponent	Continuous	As per BOQ
Noise Pollution and Excessive Vibrations	<ul style="list-style-type: none"> • Enforcement of Traffic Act regulations to ensure that all vehicles using the road are in good condition all the time to avoid excessive noise generation. 	Proponent	Continuous	50,000

	<ul style="list-style-type: none"> • Install speed control measures such as bumps and ramble strips in the areas there are institutions e.g. school, churches etc. • Install no hooting signs in sensitive areas i.e. near schools etc. 			
NEGATIVE IMPACTS DURING DECOMMISSIONING PHASE				
Noise and vibration	<ul style="list-style-type: none"> • Significant impacts on the acoustic environment will be mitigated as described above. 	Contractor/Proponent	One off	50,000
Solid waste generation	<ul style="list-style-type: none"> • Solid waste resulting from demolition or dismantling works will be managed as described above. 	Contractor/proponent	One off	30,000
Dust emission	<ul style="list-style-type: none"> • High levels of dust concentration resulting from demolition or dismantling works will be minimized as described earlier. 	Contractor/proponent	One off	50,000

9.4 Environmental Monitoring

Monitoring of noise, vibration, dust and water quality would be carried out in accordance with the specialist and environmental procedures and environmental commitments made.

Environmental Inspection and Reporting during the Construction phase

The Contractors Environmental officer would carry out an assessment of the Project's environmental performance, based upon the reports from the environmental management representatives during the period; reports from the environmental specialists and from his/her own site inspections. This would be carried out in monthly intervals but could be held more regularly depending on the nature of the construction activity. An assessment of the performance over the month would be made and quantified. A monthly report detailing performance for the period would be provided to the Engineer and would include a summary of environmental inspections completed, audits undertaken, complaints and incidents.

Environmental Monitoring during operation and decommissioning phase

The proponent is advised to draw a monitoring plan according to decision made with all the stakeholders. Technical advice can be sort from National Environment Management Authority as well as other stakeholders.

CHAPTER TEN: CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions

The proposed project is unlikely to generate irreversible or permanent negative impact, or have serious implications on physical, biological, cultural and socio-economic features of concern at/or near the proposed site of the project, this means upgrading of Githunguri-Gatitu-Githiga road do not pose any serious threat to the environment. The findings of the ESIA has also established that the proposed development project by proponent is a worthy investment and broadly with no doubt will contribute significantly to the economic development of the Ndumberi town and Kiambu municipality at large. This will be achieved through the prior discussed positive impacts.

The studies conducted on the proposed upgrading of Githunguri-Gatitu-Githiga to Bituminous Standards shows that indeed the project will promote development in Kiambu municipality. Therefore, there is need for all the responsible stakeholders to implement the recommendations given in the ESMP to ensure sustainability of the project. The contractor shall update Environmental and Social Management Plan in order to identify emerging and sequence environmental activities that are needed in order to complete the required construction process.

10.2 Recommendations

- ESIA project report recommends proponent, contractor and the financier take all reasonable measures to mitigate any undesirable effects contemplated or not contemplated in this report.
- During the handover of the road project to the proponent the supervising engineer should prepare a Road Completion Report and hand it over to the proponent and financier.
- The proponent is expected to conduct environmental audit so as to evaluate all the activities and processes of an ongoing project to determine how far these activities conforms with the approved environmental and social management plan of the project and sound environmental management practices; prepare and submit an environmental audit report on those measures to the NEMA annually or as the Authority may require.
- The proponent must adhere and implement in full the proposed Environmental and Social Management Plan. The proponent must observe adherence to the legislations discussed under Legal and Regulatory Chapter of this report.

- Only inevitable disturbance of flora and fauna should occur. Replanting of cleared vegetation should be done to replace the cleared vegetation. The project contractor should only use serviceable equipment and machinery during construction phase.
- All the employees should be provided with the right working tools and safety gear to protect them when executing their duties including an equipped First Aid Kit.
- The contractor should conduct an ESIA for the borrow pits or quarry sites and a license should be acquired from NEMA before starting to extract construction materials.
- Bumps should be installed at all sharp corners.
- The road upgrading works should not block access to properties and where it has happened, then the contractor should provide access and where there is a deep cut, then an access lane or staircases should be provided.
- The contractor should designate pedestrian crossing points, guard rails and adequate signage at appropriate places to improve on road safety.
- During site decommissioning, all the waste and unused building materials should be removed safely from the site.
- Mobile toilets should be provided to workers for managing septic waste.
- Overall, the experts conclude that the project is environmentally, socially and economically feasible and should be allowed to be implemented or as per NEMA discretion.

REFERENCES

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- Kenya gazette supplement, *Environmental Management and Coordination Act Number 8 of 2015. Government printer, Nairobi*
- World Bank Safeguards Documents (Environmental Assessment (OP 4.01) Safeguard

LIST OF ANNEXURES

Annex 1: Lead Expert EIA/EA Licenses

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/11462

Application Reference No: NEMA/EIA/EL/15468

M/S Samuel Wakangu Kiarie
(individual or firm) of address

P.O. Box 416-00217, Limuru

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **6750**

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

Issued Date: 1/2/2020

Expiry Date: 12/31/2020

Signature.....

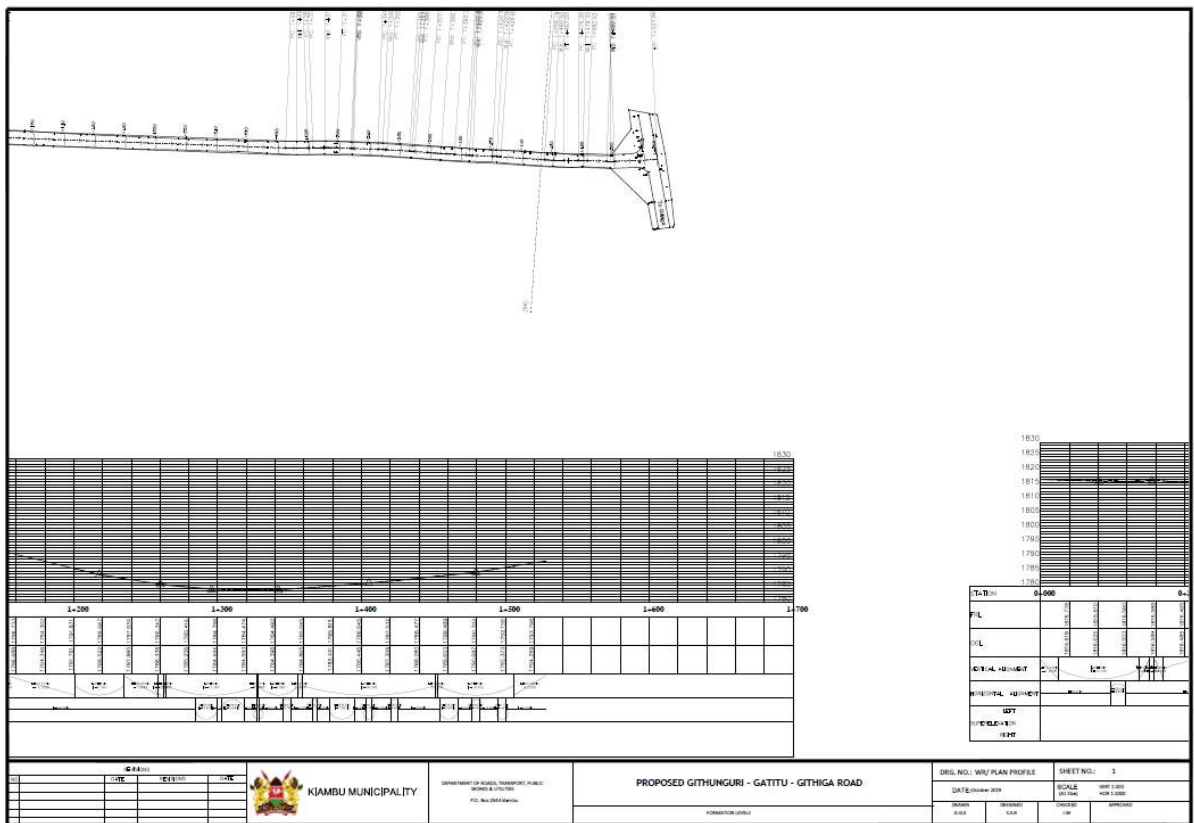
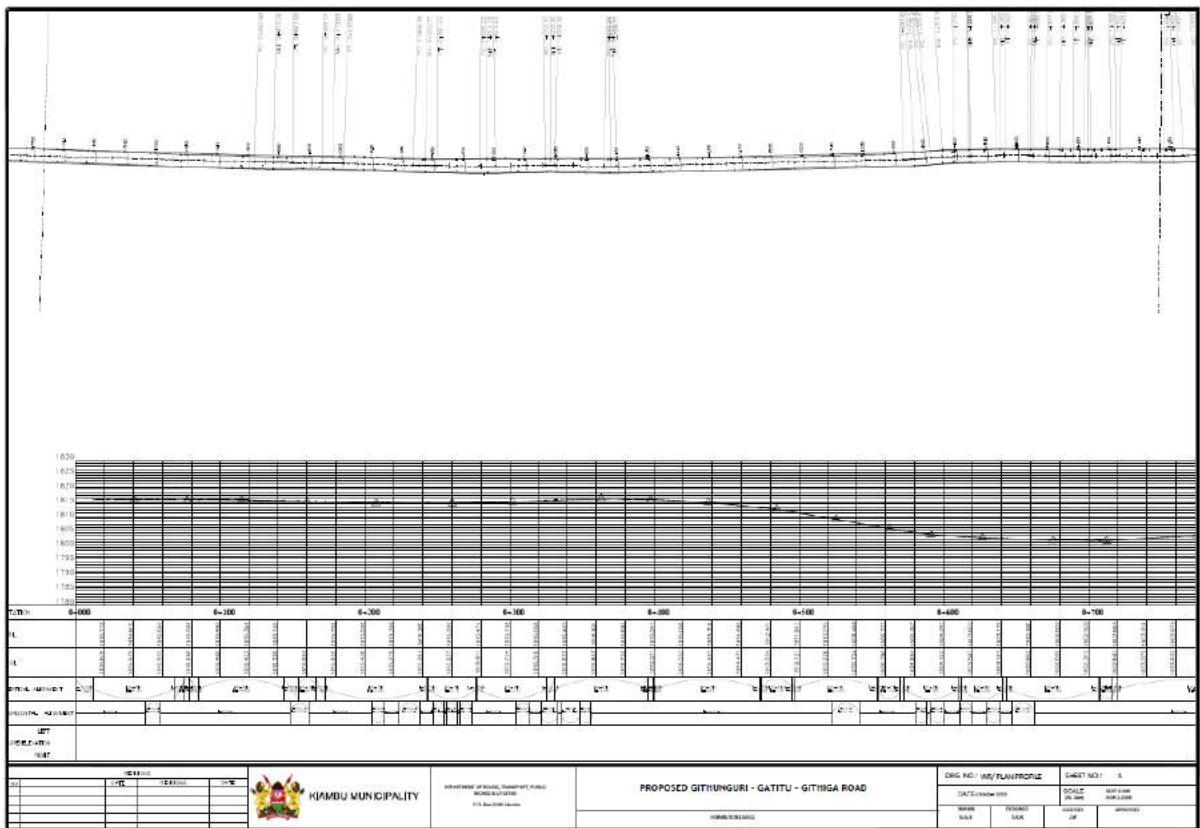
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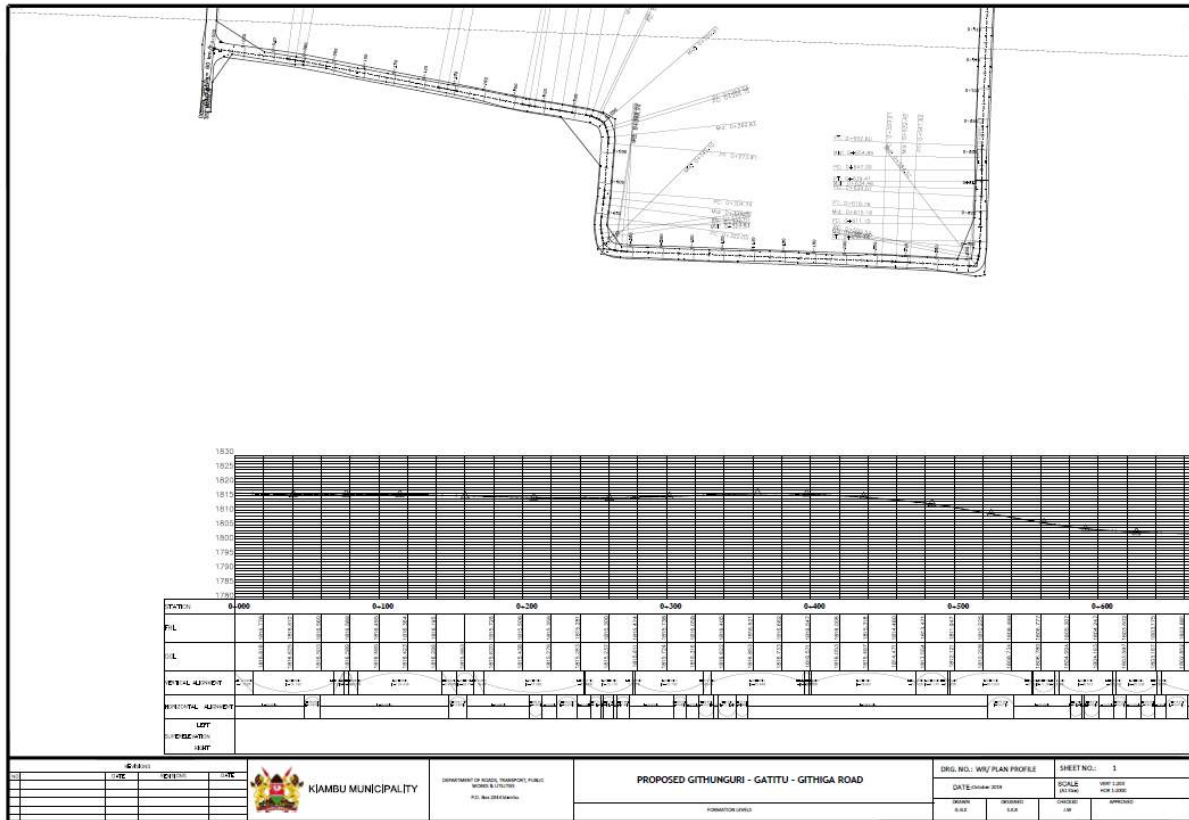
Director General
The National Environment Management
Authority

UPGRADING OF GITHUNGURI - GATITU - GITHIGA ROAD PROJECT



Annex 2: Road Designs





Annex 3: Questionnaires



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

County Government of Kiambu is proposing to undertake the above project in Kiambu municipality. As stipulated in Environmental Management and Coordination Act (EMCA), 1999-CAP 387 and Environmental Impact Assessment regulations 2003, this project requires an Environmental Impact Assessment project report. Public consultation is an important exercise for achieving the fundamental principle of sustainable development.

Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any **Environmental impacts?**

Positive impacts

.....
..... NONE
.....
.....

Negative impacts

.....
..... NONE
.....
.....

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....
.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? improved accessibility

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

NONE

Name of Respondent: ESTHER NJERI KAMERI

Contact: address/Tel: 0710970070 Location/ward: NDUMBERI

Signature Date: 09/10/2019

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be handled with utmost confidentiality.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [✓] No []

b) Do you expect the proposed project to have any Environmental impacts?

Positive impacts

Reduction of dust pollution

Negative impacts

NONE

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? ..Economic growth in the area,.....

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....Erect of bumps.....
.....
.....

Name of Respondent: ..Samuel.....Mwaura.....

Contact: address/Tel:0710458623..... Location/ward:HlumBERI.....

Signature  Date: ..21/02/2019.....

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADE OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any Environmental impacts?

Positive impacts

.....
 NONE

Negative impacts

.....
 NONE

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No []

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [] No []

If Yes/No please why?

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No []

If yes, please name the place or site.....


4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....
Concerned that the perimeter wall might be
affected by the road project.
.....

Name of Respondent: FLORENCE NJERI

Contact: address/Tel: 0701531448 Location/ward: NDUMBURI

Signature  Date: 9/10/2019

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any **Environmental impacts**?

Positive impacts

Reduction of dust pollution.....
Easy accessibility.....
.....
.....

Negative impacts

NONE.....
.....
.....

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....
.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? ... Easy accessibility, Improvement of the area in terms of security, increase in population.

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

..... Evert a bumps.....

Name of Respondent: ~~S. Ess~~ Isabella Wangini Ndug'u

Contact: address/Tel: 0723086158 Location/ward: NLAUMBERI.....

Signature [Signature] Date: 9/10/2019.....

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

County Government of Kiambu is proposing to undertake the above project in Kiambu municipality. AS stipulated in Environmental Management and Coordination Act (EMCA), 1999-CAP 387 and Environmental Impact Assessment regulations 2003, this project require an Environmental Impact Assessment project report. Public consultation is an important exercise for achieving the fundamental principle of sustainable development.

Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any **Environmental impacts**?

Positive impacts

Control of storm water by building drainage

Negative impacts

NONE

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? ... Easy accessibility

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

..... NONE

Name of Respondent: ... Reben Njonga Marigia

Contact: address/Tel: ... 0798272100 Location/ward: ... Ndumbini

Signature ... [Signature] Date: ... 9/11/2019

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

County Government of Kiambu is proposing to undertake the above project in Kiambu municipality. AS stipulated in Environmental Management and Coordination Act (EMCA), 1999-CAP 387 and Environmental Impact Assessment regulations 2003, this project require an Environmental Impact Assessment project report. Public consultation is an important exercise for achieving the fundamental principle of sustainable development.

Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any **Environmental impacts?**

Positive impacts

.....
NONE
.....
.....

Negative impacts

.....
NONE
.....
.....

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....
.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? ... Promotes development

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....
.....
.....

Name of Respondent: ... CHRISTINE NJOKI KAMAU ...

Contact: address/Tel: ... 0721626455 ... Location/ward: ... NJUMBERI ...

Signature [Signature] ... Date: ... 09/10/2019 ...

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. **PART A: ENVIRONMENTAL ASPECTS** (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any **Environmental impacts**?

Positive impacts

Reduce dust pollution
.....
.....
.....
.....

Negative impacts

Over speeding of cars & increase in road users
.....
.....
.....

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....
.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? ...Easy... accessibility.....

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....Erect..... of..... detri bumps.....
.....Inclusion..... of..... road signs.....
.....

Name of Respondent:Anthony..... Njuguna..... Njuguna Njorge.....

Contact: address/Tel:0713949614..... Location/ward:Ndumbeni.....

Signature *[Signature]*..... Date:9/10/2019.....

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any Environmental impacts?

Positive impacts

Reduce dust pollution
Improved storm water drainage

Negative impacts

NONE

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? Promote development

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....
NONE
.....
.....

Name of Respondent: MICHAEL KAMAU MRUGA

Contact: address/Tel: 0717092833 Location/ward: NDUMBE RI

Signature [Signature] Date: 09/10/2019

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No [✓]

b) Do you expect the proposed project to have any Environmental impacts?

Positive impacts

Improved accessibility where there is steep terrain.

Negative impacts

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? Improved accessibility & security

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....
.....
.....

Name of Respondent: VERONICA NJUMI

Contact: address/Tel: 0712641881 Location/ward: NDUMBERI

Signature [Signature] Date: 29/10/2019

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be handled with utmost confidentiality.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [✓] No []

b) Do you expect the proposed project to have any Environmental impacts?

Positive impacts

- Reduced dust pollution

Negative impacts

NONE

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? ..improve accessibility.....

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....
Erect speed bumps
.....

Name of Respondent: ELIZABETH MUTIBONI KATHIGA

Contact: address/Tel: 0717163540 Location/ward: NDUMBERI

Signature *[Signature]* Date: 07/10/2019

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADING OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any **Environmental impacts**?

Positive impacts

Reduced dust pollution
.....
.....
.....
.....

Negative impacts

None
.....
.....
.....

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....
.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No []

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [] No []

If Yes/No please why? Promote development, Promote growth.....

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No []

If yes, please name the place or site.....


4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....
Speed bumps should be erected.
.....

Name of Respondent: ANN WAMBUI KIMANI

Contact: address/Tel: 0714747341 Location/ward: NDUMBELI

Signature  Date: 09/10/2019

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT QUESTIONNAIRE FOR THE UPGRADE OF 1.5KM GITHUNGURI-GATITU-GITHIGA ROAD TO BITUMINOUS STANDARDS AND LIGHTING.

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be handled with utmost confidentiality.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [X] No []

b) Do you expect the proposed project to have any Environmental impacts?

Positive impacts

- Avoid flooding storm water drainage should be well directed, reduce stagnation of storm water

Negative impacts

NONE

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? ...improve area security, improve accessibility

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....
.....
.....

Name of Respondent: ...STEPHEN CHEBE KARIRI...

Contact: address/Tel: ...0722901711... Location/ward: ...NDUMBE...

Signature ... [Signature] ... Date: ...9/10/2019...

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be handled with utmost confidentiality.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No [✓]

b) Do you expect the proposed project to have any Environmental impacts?

Positive impacts

Reduction of dust pollution
.....
.....
.....
.....

Negative impacts

NONE
.....
.....
.....

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....
.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? Easy accessibility

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

NONE
.....
.....
.....

Name of Respondent: Susan Kimani

Contact: address/Tel: 0727141774 Location/ward: NDUMBERI

Signature [Signature] Date: 9/10/2019

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be handled with utmost confidentiality.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [✓] No []

b) Do you expect the proposed project to have any Environmental impacts?

Positive impacts

Reduce dust pollution.
.....
.....
.....
.....

Negative impacts

NONE
.....
.....
.....

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....
.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [✓] No []

If Yes/No please why? ..Improve accessibility.....

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

.....Erect of speed bumps.....
.....Warning signs at the corner.....
.....

Name of Respondent: ..Mary Mugeve Gathimwa.....

Contact: address/Tel: ..0719438296..... Location/ward: ..Nlumberi.....

Signature ..*Mary Mugeve*..... Date: ..9/10/2019.....

Thank You for Your Participation and Cooperation



COUNTY GOVERNMENT OF KIAMBU

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Therefore, as one of the local community member interested/ affected party, we kindly request you to fill this questionnaire and give us your comments/opinions on the proposed project.

Your participation in answering this questionnaire will be much appreciated and will be *handled with utmost confidentiality*.

1. PART A: ENVIRONMENTAL ASPECTS (Please tick appropriately).

a) Are you aware of the proposed project? Yes [] No []

b) Do you expect the proposed project to have any **Environmental impacts**?

Positive impacts

.....
NONE
.....

Negative impacts

.....
NONE
.....

c) Make suggestions on the measures required to mitigate against the foreseen negative impacts.

.....
.....

2. PART B: SOCIAL ECONOMIC ASPECTS (Please tick appropriately).

a. Will the proposed project involve loss of land/involuntary resettlement of people?

Yes [] No [✓]

If yes, state the location where people will be affected?

b. Do you support the proposed project?

Yes [] No []

If Yes/No please why? Improved road condition & accessibility.

3. PART C: HISTORICAL/CULTURAL RESOURCES (Please tick appropriately).

1. Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites in the proposed project area?

Yes [] No [✓]

If yes, please name the place or site.....

4. PART D: ANY OTHER INFORMATION

Do you have any other Opinion/Suggestion/Recommendations about the project?

Storm water drainage should be well laid.

Name of Respondent: MARY MWIGAI


Contact: address/Tel: 0724793014 Location/ward: NISUMBERI

Signature: [Signature] Date: 09/10/2019

Thank You for Your Participation and Cooperation

Annex4: Stakeholders Meeting/Forum**Minutes (i)**

County Government of Kiambu



Kiambu Municipality

**MINUTES OF KIAMBU MUNICIPALITY CITIZEN FORUM, HELD ON 1st March 2019 AT
Kiambu Bus Park AT 11:00 AM**

Title of meeting	Kiambu Municipality Launching of Projects
Members present	Attendance List attached
Venue	Kiambu Bus Park
Date of meeting	1 st March , 2019 – 11:00 am

No.	Subjects / Decisions	Actions
	AGENDA 1. Opening Remarks 2. Welcoming Remarks by Municipal Manager 3. Quarterly Progress Report on 2018//2019 Projects 4. Guidance on Criteria for Projects 5. Plenary session 6. AOB 7. Closing Remarks	
1/04/19	Preliminaries The meeting started at 11.00 am with a word of prayer from Rev. Kin-yajui and followed with introduction of Kiambu Municipality board members to members who attended the forum by the Chairman of the Kiambu Municipality Board. Board members who were present at the forum included:	

Department of Municipal Administration and Urban Development (MAUD)

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04/19	<p>Welcoming Remarks by MCAs</p> <p>The session was facilitated by the Chairman of the Kiambu Municipal Board welcoming</p> <p><u>MCA Riabai Ward</u></p> <p>The MCA Riabai Ward welcomed members to the forum and stated that he was elated that the forum was being held in his ward .</p> <p>The MCA Riabai Ward also stated that the reason for the forum was for members of the public to participate in selection of projects to be undertaken by Kiambu Municipal Board and also gave an update of the current status of projects and challenges in his ward and the county at large</p> <p>There has been a court case challenging the supplementary budget by the County Government but it will be sorted out soon.</p> <p>He also stated that world bank will come to the ground to verify that projects are actually been done.</p> <p><u>MCA Tinganga Ward</u></p> <p>The MCA Tinganga Ward expressed his gratitude to the MCA Riabai Ward for welcoming him and his delegation to the forum as well as the Kiambu Municipal Board for organizing the forum .</p> <p>He also stated that announcement had been done in churches to counter the short notice given for the forum because of the World Bank deadlines.</p> <p>He also stated that suggestions for projects can be given orally,through memorandas or through expert knowledge</p> <p>-He also encouraged the attendees to turn out in large numbers for the 2019 census which will lead to increased resources to the county due to increased population.</p> <p><u>MCA Ndumberi Ward</u></p> <p>The MCA Ndumberi Ward also expressed to the attendees for turning out in large numbers for the forum despite the short notice</p> <p>-He also encouraged the Kiambu Municipal Board to ensure that jobs are created for the locals especially at the evaluation stage where contractors are awarded tenders and also the young people can also get jobs.</p> <p>-He also highlighted the projects undertaken in Ndumberi Ward which included street lighting which was initiated by his office .</p> <p><u>CEC -Lands Housing ,Physical Planning ,Municipal Administration and Urban Development</u></p> <p>The CEC welcomed the members to the forum and also thanked the citizens for turning out in large numbers</p> <p>He also highlighted the projects which are allowed to be undertaken under the Kenya Urban Support Programme.These include ;</p> <ol style="list-style-type: none"> 1. Waste management (liquid and solid) <ul style="list-style-type: none"> Examples: <ul style="list-style-type: none"> o Solid waste: collection equipment, collection bins, transfer stations, collection points (construction of sanitary landfill excluded) o Liquid waste: sludge ponds, community septic tanks, vacuum trucks, vacuum handcarts)
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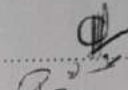
	<ol style="list-style-type: none"> 2. Storm water drainage <ul style="list-style-type: none"> o Urban drainage systems; flood control systems 3. Connectivity (roads, non--motorized transport facilities, and street and security lights) <ul style="list-style-type: none"> o Urban roads pedestrian walkways and bicycle paths, street and security lights and road signs 4. Urban socio-economic infrastructure <ul style="list-style-type: none"> o Urban greenery and public spaces 5. Fire and disaster management <ul style="list-style-type: none"> o Fire control stations and disaster management equipment (firefighting trucks, rehabilitation and/or construction of new firefighting station and facilities) <p>Non-eligible activities include</p> <ol style="list-style-type: none"> 1. Any investment projects that trigger Category A environmental impact (as defined by the World Bank) 2. The following types of investment: <ul style="list-style-type: none"> o power plants; o dams; o highways; o urban metro systems; o railways and ports; o engineered landfills; and o office buildings. 3. Land acquisition 4. Investment projects that are not included in the urban IdeP or urban spatial plan <p>He also stated that Kiambu Municipality has been allocated 167,981,700 whereby projects should not cost below 50 million in order for it to be eligible under the programme. He also categorically stated that water projects are not allowed by the World Bank under the Kenya Urban Support Programme.</p>	
<p>3/04/19</p>	<p>Quarterly Report to citizens (progress report on 2018/2019 Projects)</p> <ul style="list-style-type: none"> -The chairman who was the Master of Ceremony welcomed a board member to present a technical report detailing the progress on the current project. -It was stated that projects are ongoing and there is considerable progress given that the project is at the initial stage. Activities that have already been completed are those that pertaining preparation -The Board Member also stated that contractor needs to move with speed to make sure that the project is completed on time and that he needs to give the priority of job opportunities to locals and not those from another county. 	


4/19	<p>Guidance on Criteria for 2019/2020 Projects</p> <p>- Assisted by the municipal manager, the Chairman of the Kiambu Municipal board presented the eligible urban functional investment areas as stipulated in the Program Operations Manual for World Bank Projects under the Kenya Urban Support Programme.</p> <p>These include;</p> <ol style="list-style-type: none"> 1. Waste management (liquid and solid) 2. Storm water drainage 3. Connectivity (roads, non-motorized transport facilities, and street and security lights) 4. Urban socio-economic infrastructure 5. Fire and disaster management <p>-Attendees were encouraged to suggest projects that would fit into these categories.</p>	
5/04/19	<p>Plenary session</p>	
	<p>Attendees were eager to suggest projects which they submitted orally and through memorandas</p> <p>1) Citizens from Ndumberi submitted a memoranda for the suggested projects for 2019/2020. Projects included:</p> <ul style="list-style-type: none"> • Ngegu Sewer line, • Githunguri-Gatitu-Githiga Road (1.5 kmtrs), • Garbage Collection (Ndumberi Town & its environs), • Storm Water Drainage (Ndumberi Town & its environs), • Sports Complex (Ndumberi Town). <p>2) Citizens from Ting'ang'a ward also suggested projects for 2019/2020. Projects included:</p> <ul style="list-style-type: none"> • Waste Management both solid and liquid waste, • Storm Water Drainage (Mugumo Estate) • Construction of Roads • Urban Social and Economic Infrastructure 	

<p>-A vote of thanks was given by Tinganga Ward Representative - Alois Njoroge</p> <p>-The meeting ended at 2:00 pm with a word of prayer from a member of the Riabai Ward Clergy</p>	
---	--

Signed

Name: Thomas Kimari
Chairman
Name: Joshua Muthee
Secretary

Signature:  Date:

Signature:  Date:

Minute (ii)

County Government of Kiambu



Kiambu Municipality

MINUTES OF KIAMBU MUNICIPALITY BOARD MEETING, HELD ON 25TH APRIL 2019 AT RED NOVA BOARDROOM AT 9:00 AM

Title of meeting	Kiambu Municipality Board Meeting
Members present	Attendance List attached
Venue	Red Nova Boardroom
Date of meeting	25 th April, 2019 – 9:00 am


No.	Subjects / Decisions	Actions
	<p>AGENDA</p> <p>1. Confirmation of Previous Board Meeting Minutes and matters arising</p> <p>2. Brief from Municipal Manager on Citizen forum</p> <p>3. Approval of Annual Urban Municipal Investment Plan - 2019/2020</p> <p>4. AOB</p> <p>5. Adjournment</p>	
1/04/19	<p>Preliminaries/Introduction</p> <p>The meeting started at 9.00 am with a word of prayer from Bsp. Wanderi after which the Chairman Mr. Thomas Kimari called the meeting to order.</p> <p>Board members who were present at the meeting included:</p>	


No.	Subjects / Decisions	Actions
	<ol style="list-style-type: none"> 1. Paul Gituku 2. Ruth Wanjiku-Vice Chairperson 3. Peter Kiongo 4. Thomas Kimari -Chairman 5. Dr. Thiguri Warwathe 6. Esther Nyaguthii 7. James Kiruga Wamwati 8. John Wanderi Mwangi 9. Joshua Muthee- Secretary and EX-OFFICIO Board Member/Municipal Manager. <p>The Chairman -Kiambu Municipality Board also introduced Dr. Thinguri Warwathe, a board member who was not acquainted with other members.</p> <p>The Chairman informed members that the board was required to elect a vice chairperson and in line with the gender rule in order for the board to be constitutional.</p> <p>Members unanimously agreed to elect Ruth Wanjiku as the vice chairperson of the board</p>	
2/04/19	<p>Confirmation of previous board meeting minutes and matters arising</p> <p>The minutes of the previous board meeting held on April 9, 2019 were read by Mr. Joshua Muthee, Municipal Manager and Secretary of the Kiambu Municipality Board. He confirmed that the previous minutes were sent to members earlier on. A recommendation was made by the Vice Chair, Ruth Wanjiku that each minute to be looked on to for members to raise issues that need to be addressed.</p> <p>The minutes were confirmed by Mr. Paul Gituku and seconded by Mr. Paul Wamwati for the previous meeting.</p>	

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3/03/19	<p>Brief from the municipal manager on citizen forum The Municipal Manager gave a brief summary of the citizen forum held on 15th April 2019 which was considered a success and well attended.</p> <p>During the citizen forum:</p> <p>1) Citizens from Ndumberi submitted a memoranda for the suggested projects for 2019/2020. Projects included:</p> <ul style="list-style-type: none"> • Ngegu Sewer line, • Githunguri-Gatitu-Githiga Road (1.5 kmtrs), • Garbage Collection (Ndumberi Town & its environs), • Storm Water Drainage (Ndumberi Town & its environs), • Sports Complex (Ndumberi Town). <p>2) Citizens from Ting'ang'a ward also suggested projects for 2019/2020. Projects included:</p> <ul style="list-style-type: none"> • Waste Management both solid and liquid waste, • Storm Water Drainage (Mugumo Estate) • Construction of Roads • Urban Social and Economic Infrastructure • Fire and Disaster Management • Health (upgrade of Ting'ang'a Dispensary) <p>3) Citizens from Riabai ward also suggested projects for 2019/2020. Projects included</p> <ul style="list-style-type: none"> • Street lighting along the major/main roads, • Safety footpaths, • Rehabilitation of Markets • Public toilets in the major shopping centres. (Kirigiti, Gitamaiyu and Riabai). • Rail safety guards along the black spot on Kiambu Ruiru Road and Kirigiti Riabai road. • Proper channels of garbage collection. 	

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	<ul style="list-style-type: none"> • An alternative cemetery be identified since the long serving one at Mada area has long filled up. • Tarmacking and opening up of Ruthiru-ini and also Riabai Gicoco all-weather roads. • Bumps/rambles at strategic areas along Kiambu-Ruiru road and specifically at Kiambu High School and also along Kirigiti-Riabai road and specifically at Mada area. • Tarmacking of the all-weather road stretching from Mada area to Gatiina area. 	
4/03/19	<p>Approval of annual urban municipal investment plan - 2019/2020</p> <p>Board Members unanimously agreed to adopt the Kiambu Urban Municipal Investment Plan - 2019/2020.</p> <p>Projects included in the Urban Municipal Investment plan are as listed below:</p> <ol style="list-style-type: none"> 1. Upgrading of Mugumo Estate Road to Bituminous Standards (1 KM) and Storm water Drainage in Mugumo Estate. Project budgetary allocation – Kshs. 52,000,000/=. 2. Upgrading of Riabai Shopping Center Road to Bituminous Standards (1 Km) and Improvement of Riabai Shopping Center - Market Rehabilitation and Street Lighting. Project budgetary allocation – Kshs. 59,987,800/=. 3. Upgrading of Githunguri - Gatitu - Githiga Road (1.5 KM) to Bituminous Standards. Project budgetary allocation – Kshs. 55,993,900/=. 	
5/03/19	<p>AOB</p> <p>Having no other AOB, the Chairman called off the meeting at 10:45 AM and ended with a word of prayer from Esther Nyaguthii</p>	

Signed

Name: Thomas Kimari Kamau Signature:  Date:

Name: Joshua Muthee Signature:  Date: