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MINISTRY OF TRANSPORT, INFRASTRUCTURE, HOUSING AND URBAN DEVELOPMENT



ENVIRONMENTAL AND SOCIAL IMPACT
ASSESSMENT STUDY REPORT FOR THE
PROPOSED RECONSTRUCTION AND
REHABILITATION OF THE MAMBOLEO-MIWANICHEMELIL-MUHORONI-KIPSITET C674
(FORMERLY C34) ROAD TO BITUMEN STANDARD
AND ASSOCIATED SPUR ROADS

OCTOBER 2020

DECLARATION

TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THEPROPOSED RECONSTRUCTION AND REHABILITATION OF THE MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD TO BITUMEN STANDARD AND ASSOCIATED SPUR ROADS

This ESIA study report has been prepared in accordance with the provisions and requirements of the Environmental Management and Coordination Act (EMCA) Cap 387 and subsidiary regulation -Environmental (Impact Assessment and Audit) Regulations, 2003,

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TABLE OF CONTENTS	
LIST OF PLATES	vi
LIST OF FIGURES	vii
LIST OF TABLES	vii
ABBREVIATIONS	viii
EXECUTIVE SUMMARY	ix
CHAPTER 1.0: INTRODUCTION	47
1.1 Project Background	47
1.2 Objectives of the ESIA	47
1.3 Terms of Reference	48
1.4 Project Background, Overview, Justification and Objectives	49
1.3.1 Project Background	49
1.3.2 Project Overview	50
1.3.3 Project Purpose and Objectives	51
1.4 Scope of the ESIA Study	52
1.5 Data collection methods and procedures	52
1.6 ESIA Team Composition	55
1.7 ESIA organization and structure	55
CHAPTER 2.0: PROJECT DESCRIPTION	57
2.1 Introduction	57
2.2 Project Details	57
2.3 Project activities and processes	59
2.4 Project cost	60
CHAPTER 3.0: POLICY, LEGAL AND REGULATORY FRAMEWORK	61
3.1 Introduction	61
3.2 Policy and institutional framework	61
3.2.1 The Constitution of Kenya of 2010	61
3.2.2 National policy framework	62
3.2.3 Environmental Guidelines	67
3.3 National environmental legal framework	67
3.3.1 Environmental Management and Coordination Act (EMCA, Cap 387)	68
3.3.2 The Wildlife Management and Conservation Act 2013	74
3.3.2 Forest Conservation and Management Act, 2016	74
3.3.3 The Water Act 2016	75
3.3.4 The Agriculture, Fisheries and Food Authority Act of 2013	76
3.3.5 Energy Act, 2006	77
3.3.6 Land Act, 2012	77
3.3.7 The Land Registration Act, 2012	78
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PRECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MULKIPSITET C674 (FORMERLY C34) ROAD i \mid P	

KENYA NATIONAL HIGHWAYS AUTHORITY 3.3.8 The National Land Commission Act, 2012 (No. 5 of 2012)	OCTOBER 2020
3.3.9 Community Land Act 2016	
3.3.10 The Environment and Land Court Act, 2011	
3.3.11 The County Governments Act 2012	
3.3.12 Occupational Safety and Health Act 2007	
3.3.13 The Public Health Act (Chapter 242) of Revised Edition 2012	
• • • • • • • • • • • • • • • • • • • •	
3.3.14 The Valuers Act (Cap 532), 1985	
3.3.15 Physical Planning Act (Cap. 286)	
3.3.16 The Penal Code (Cap. 63)	
3.3.18 Work Injury Compensation Benefit Act (WIBA) 2007	
3.3.19 Public Roads and Roads of Access Act Cap 399	
3.3.20 The Traffic Act Cap 403	
3.3.21 Building Code 2009	
3.3.22 The Kenya Roads Act, 2007	
3.3.23 The Kenya Roads Board Act, 1999	
3.3.24 HIV / AIDS Act, 2006	
3.3.25 Urban Areas and Cities Act No 13 of 2011	
3.3.26 The National Gender and Equality Act, 2011	
3.3.27 The Sexual Offences Act, 2006 and its amendment 2012	
3.3.28 Matrimonial Property Act (No. 48 of 2013)	
3.3.29 Persons with Disability Act, Chapter 133	
3.3.30 Security Laws (Amendment) Act, 2014	
3.4 National institutional / Administrative framework for the proposed project	
3.4.1 The National Environment Management Authority	
3.4.2 The County and Sub-County Environment Committees	85
3.4.3 Ministry of Transport, Infrastructure, Housing and Urban Development (MoTIH	UD)85
3.4.4 The Kenya Roads Board	
3.4.5 Kenya National Highways Authority (KeNHA)	86
3.4.6 Directorate of Occupational Safety and Health Services (DOSHS)	86
3.4.7 Kenya Wildlife Service (KWS)	86
3.4.8 Water Resources Authority (WRA)	86
3.4.9 Kenya Forest Service (KFS)	86
3.4.10 The National Museums of Kenya (NMK)	87
3.4.11 National Land Commission (NCL)	87
3.5 International conventions and guidelines	87
3.5.1 Vienna Convention on the Protection of the Ozone Layer	87
3.5.2 United Nations Convention on Biological Diversity (UNCBD)	87
3.5.3 African Convention on the Conservation of Nature and Natural Resources	87
3.5.4 Convention on International Trade in Endangered Species	88

KENYA NATIONAL HIGHWAYS AUTHORITY 6.5 Alternative Road Building Technologies	OCTOBER 2020 112
a. Concrete Paving	112
b. Asphalt Paving	112
CHAPTER 7.0 GRIEVANCE REDRESS MECHANISM	113
7.1 Background	113
7.2 Objectives of the GRM	113
7.3 Proposed Procedure	114
7.4 Management of Grievances under the project RAP	117
CHAPTER 8.0 ANALYSIS OF ENVIRONMENTAL IMPACTS	118
8.1 Definition and classification of impacts	118
8.2 The Leopold matrix	118
8.3 Impact identification and evaluation	118
8.4 Description of the terms used	119
8.5 Impact magnitude Indicators	121
8.6 Potential environmental and social impacts	125
8.6.1 Potential Construction Phase Positive Impacts	125
8.6.3 Negative Impacts and Mitigation Measures	126
8.6.4 Cumulative Impacts	141
CHAPTER 9.0: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	143
9.1 Introduction	143
9.2 Objectives of the ESMP	143
9.3 GENERAL EHS PLANS REQUIREMENTS IN CONSTRUCTION PROJECT	170
9.3.1 Occupational Health and Safety Plans	170
9.3.2 Borrow Pit/Quarry Rehabilitation Plan	173
9.3.3 Vehicle/Traffic Management Plan	176
9.3.4 Waste Management Plan	176
9.3.5 Camp Design / Installation Plan	177
9.3.6 Ancillary Plans	177
9.3.7 Spills Prevention and Response Plan	178
9.3.8 Emergency Response Plan (ERP)	179
9.3.9 Environmental Awareness Plan	182
9.3.10: Decommissioning Plans for the camps and other installations	182
9.4 ENVIRONMENTAL MONITORING	183
CHAPTER 10.0. CLIMATE CHANGE AND ROAD INFRASTRUCTURE	187
CHAPTER 11.0: CONCLUSION AND RECOMMEDNDATIONS	191
11.1 CONCLUSION	191
11.2 RECOMMENDATIONS	192
CHAPTER 12.0 REFERENCES	195
APPENDICIES	196
APPENDIX 1. EXPERT LICENSES	196
APPENDIX 2: PUBLIC CONSULTATION MINUTES	197

KENYA NATIONAL HIGHWAYS AUTHORITY	OCTOBER 2020
APPENDIX 3: COMPLAINTS REGISTRATION FORM	227
APPENDIX 4: GRIEVANCE RESOLUTION FORM	230
APPENDIX 5: QUESTIONNAIRES	231
ADDENDIY 6. NEMA ADDROVED ESIA TORS	306

LIST OF PLATES

Plate 1.1: a and b Showing the current dilapitated road section	49
Plate 4.2: a and b Showing topography of the project area	95
Plate 4.3: Showing the geology of the project area (soils and rocks at the stream bed)	96
Plate 4.4: Showing dust from a) tractor transporting sugar cane, b) smoke emissions from Kibos	Sugar
factory and c) motorists utilising the road	99
Plate 4.5: a) surface water source and community members doing laundry in one of the rivers	100
Plate 4.6: a) Vegetation along the project road, b) riverine vegetation and c) napier grass	101
Plate 4.7: Zebu cattle enroute to grazing along the project road	101
Plate 4.8: Farmland with maize, bananas and sugarcanes	103
Plate 4. 9: Different forms of economoic activities a)matatus, b) market stalls, c) car wash, d) bods	abodas,
e and f)sand harvesting,	105
Plate 4. 10: Sample education institution along the project road	106
Plate 4.11: Showing Kibos Sugar factory	107

LIST OF FIGURES

Figure 1.1: Showing Map of the project road and associated feeder roads	
Figure 1.2: Showing the location of the three counties where the proposed road project is l	
arrow and red highlight)	<u>9393</u> 97
LIST OF TABLES	
Table 1.1. Analysis of Van EMCA 1000 Delevent Decodetions	(0(072
Table 1.1: Analysis of Key EMCA, 1999 Relevant Regulations	
Table 2: Proposed grievance framework	<u>117117121</u>
Table 3: Key of the Rating Parameters	<u>120120124</u>
Table 4: Environmental Impact Matrix	
Table 5: Health and Safety Plan Content	
Table 6: Waste Management Plan during Construction Phase	176 176180
Table 7: Issues of Concern in the Spills Response Plan	178 178 182
Table 8: Composition and Tasks of Emergency/Disaster Preparedness Response Team	<u>181181185</u>
Table 9: Environmental Monitoring Plan	<u>184<mark>184</mark>188</u>

ABBREVIATIONS

ESIA Environmental and Social Impact Assessment

EMCA Environmental Management and coordination Act

ESIA Environmental and Social Impact Assessment

ESMP Environmental and Social Management Plan

GoK Government of Kenya

CoK Constitution of Kenya

HIV/AIDs Human Immunodeficiency Virus/ Acquired immune deficiency syndrome

KeNHA Kenya National Highways Authority

KeRRA Kenya Rural Roads Authority

Km Kilometers

KFS Kenya Forest Service

NEC National Environment Council

NEAP National Environmental Action Plan

NEMA National Environmental Management Authority

RAP Resettlement Action Plan

ToR Terms of Reference

WRA Water Resource Authority

EXECUTIVE SUMMARY

Introduction

The Government of Kenya (GoK) through its implementing agency Kenya National Highways Authority (KeNHA) has set aside funds from Road Maintenance Levy Fund (RMLF) to be applied for use in the reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard. In addition the project will include upgrading of the 54kms of spur roads (Miwani-Ombeyi-Ahero Road -16kms, Koru Spur roads-5.5kms, Snghor-14 kms, Riat Market-10kms, Mambolea- Gaseta-Muhoroni-5.5kms, Mamboleo-ASK Showground- Migosi-3kms). Road transport is the predominant mode of transport in Kenya, carrying approximately 93% of all cargo and passenger traffic in the country. The road network in Kenya has been established to be approximately 160,886 km long, comprising of approximately 11,189km of paved roads and 149,689km of unpaved roads. The bulk of the road network in Kenya lies within the highly populated parts of the country, providing some level of access to the rest of the country. In this regards, Kenya National Highways Authority intends to focus on optimizing the quality, timeliness, and cost effectiveness in the project implementation through the use of innovative and creative techniques and strategies to optimize the performance of the road network

In order to identify the potential environmental and social impacts and to come up with the proper mitigation measures for the proposed the reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard. In addition the project will include upgrading of the 54kms of spur roads, the ESIA team utilized both conventional and participatory approaches in primary and secondary data collection, synthesize, analysis reporting and documentation. The public participatory approaches was used as an avenue to inform the public representatives about the proposed project and to give the stakeholders an opportunity to express their concerns regarding possible impacts of the project and mitigation measures. Since the public consultation was undertaken between 1st June 2020 to 5th June 2020 at the peak of the Covid-19 pandemic, strict adherence to the Ministry of Health Guidelines on management of Covid-19 in relation to public gathering were observed.

Project Description

The works are located along the existing Kisumu – Chemelil - Muhoroni (C674) Road, which traverses Kisumu, Kericho and Nandi Counties in Nyanza region of Kenya.

The project road starts at its intersection with Kisumu – Kakamega (A1) road in Kisumu district at Mamboleo and passes through Muhoroni and terminates at km 12+600. The total estimated ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD ix | P a g e

length of the main project road is approximately about 12.6km including dualled section of 6.5k. The dualled section starts at intersection with Kisumu – Kakamega (A1) road and terminated at Gluk km 6+500. The project also includes construction of the following feeder roads: Airport Roundabout - SOAS- Riat Market, Mamboleo – Gaseta road, Mamboleo - Show Ground – Migosi-Miwani-Ombeyi-Ahero Road, Koru Spur roads, Muhoroni- Songhor and Riat Market

The sections project road traverses a fairly level terrain and straight alignment, level and rolling terrain with gentle curves, and mountainous with moderate radius curvature in Kisumu, Nyando, and Kericho, respectively.

Policy, Legal and Regulatory Framework

The key legal framework on environmental management in Kenya includes the Constitution of Kenya, 2010, the Environmental Management and Coordination Act (EMCA) Cap 387, Wildlife Conservation and Management Act, 2013, the Forest Conservation and Management Act, 2016, the Land Act 2012, among others. This report is prepared in accordance to the Environmental (Impact Assessment and Audit) Regulations, 2003 and Amendment Regulations, 2016 under EMCA, Cap 387, the principal environmental law. The Kenyan Constitution in Article 42 emphasizes that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. On social issues related to the project, relevant legislations to the project includes the Kenya National Aids Strategic Plan, Sexual offence Act on prevention and the protection of all persons from harm from unlawful sexual acts, especially youth and the vulnerable persons in close proximity to the project sites.. A number of Multi-Lateral Environmental Agreements (MEAs) have been considered key among them being the United Nations Convention on Biological Diversity (UNCBD), African Convention on the Conservation of Nature and Natural Resources, Convention on International Trade in Endangered Species, The Ramsar Convention for the conservation and sustainable utilization of wetlands, The 1992 United Nations Framework Convention on Climate Change (UNFCCC), The Paris Agreement, The Rio Declaration on Environment and Development, Earth Summit on Sustainable Development Agenda 21, The Convention on the Rights of the Child (CRC), The Convention on the Elimination of all forms of Discrimination against Women (CEDAW) and The International Labour Organization (ILO) among others.

Baseline Environmental and Socio-Economic Parameters

The proposed road and associated spur roads traverses three counties: Kisumu, Kericho and Nandi. However the largest section of the road is within Kisumu County with the road only touching on the borders of Nandi and Kericho County. The area is relatively settled with a myriad of land use practices with agriculture (large scale sugar cane farming and arable farming and subsistence animal rearing) being the most prominent land use type.

Kisumu County has seven Sub-Counties/ Constituencies namely: Kisumu East, Kisumu West, Kisumu Central, Muhoroni, Nyando, Seme and Nyakach. These are further divided into 35 wards. Nandi has 5 administrative Sub-Counties and 11 Divisions. Nandi County has a total of 99 locations and 299 sub-locations. Politically the county has six (6) constituencies; namely, Mosop, Chesumei, Aldai, Emgwen, Nandi Hills and Tinderet and 60 wards. Kericho County is divided into 6 sub-counties, which are further sub-divided into 85 locations and 209 sub-locations. Politically the county has 6 constituencies namely Belgut, Soin/Sigowet, Kipkelion West, Kipkelion East, Ainamoi and Bureti. It has a total of electoral wards.

The proposed road project traverses through Muhoroni Constituency, Nyando Constituency and Kisumu East Constituency in Kisumu County, touches the border of Kipkelion West Constituency in Kericho County and the border of Nandi Hills Constituency in Nandi County

Ecological Conditions

For Kisumu County, Kano Plains is predominantly black cotton soil which is poorly drained and unstable though suitable for rice, horticulture and sugarcane production. Seme and the lower parts of Nyakach Sub-counties are dominated by lake sediments, commonly sand and clay soils while Kisumu West Sub-county and upper-Nyakach are predominantly red-loamy soils suitable for agricultural production. The lake shores are generally swampy and offer fertile ground for horticulture and fish breeding.

Nandi County

In Nandi County, agricultural activity i depends on rainfall and altitude amongst other factors. 12 percent of the total land area comprises of forests. They include Tinderet, Serengonik, Nandi South and Nandi North forest which are an extension of the tropical Kakamega Forest. It is characterized by high rainfall and diverse species of trees.

The forests comprise of mixed indigenous hardwoods and exotic plantations at Kimondi and Serengonik forests measuring besides the 2,635.8 Ha. The total boundary length of forest in the county is about 363.8km. The medium potential areas are covered by shrubs and bushes and are mainly found on the eastern plateau parts and portions lying below the scarp on the Nyando plains. The Table 1 presents the various agro-ecological zones of the County; and the main agricultural activities and potential.

Kericho County

Kericho County lies in the Lake Victoria Basin. Its geology is characterized by volcanic rocks as well as igneous and metamorphic complexes. The county is predominantly underlain by tertiary lavas (phonolites) and intermediate igneous rocks. A small part of the county is dominated by Environmental and Social impact assessment study report for the proposed reconstruction to bitumen standards of mamboleo-miwani- chemelil-muhoroni-kipsitet C674 (formerly C34) road

undifferentiated basement system rock (granites), volcanic ash admixture and other prolific rocks.

The hilly nature in some parts of the county encourages soil erosion. This problem is however minimized by the presence of a dense vegetation cover, except in a few areas like Sigowet in Soin-Sigowet sub-county, Chilchila in Kipkelion west and partly the lower zones covering Koitaburot in Ainamoi sub-county

Physical Conditions

Kisumu County

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Climatic Conditions

Kisumu County

The climate of Kisumu County is generally warm with minimal monthly variation in temperatures between 23°C and 33°C throughout the year. The rainfall is determined by a modified equatorial climate characterized by long rains (March to May) and short rains (September to November). The average annual rainfall varies from 1000-1800mm during the long rains and 450-600mm during the short rains. The altitude in the County varies from 1,144 meters above the sea level on the plains to 1,525 meters above sea level in the Maseno and Lower Nyakach areas. This greatly influences temperatures and rainfall in the County.

January is entirely a dry month. The peak generally falls between March and May, with a secondary peak in September to November. Despite the challenges experienced in land preparation as black cotton soils are difficult to work on manually during dry and heavy rain seasons, the available rainfall is adequate and evenly distributed for small-scale food- crop production and cash-crop growing. The annual maximum temperature ranges between 25°C and 33°C and the annual minimum temperature ranges between 16°C and 18°C.

Nandi County

The Northern parts of Nandi County receive rainfall ranging from 1,300mm to 1,600mm per annum; while the Southern half which is affected by the Lake Basin atmospheric conditions receives rainfall as high as 2,000mm per annum. The County receives an average rainfall ranging from 1200mm to 2000mm per annum. The lowest rainfall is experienced in the Eastern and North eastern parts of the county, while the highest is recorded in the Kobujoi-Tindinyo area in Aldai Sub-County. Across Nandi, the highest rains are experienced in Kaptumo in Nandi South, Nandi Hills, Kapsabet and Kobujoi. The long rains start in early March and continue up to end of June; while the short rains start in mid-September and end in November. The dry spell is usually experienced from end of December to mid-March.

The rainfall distribution and intensity has a direct bearing on the economic activities in the County. Those areas that receive 1500mm and above (LH1 and UM1), are under tea cultivation. The relatively drier areas to the East and Northeast, which receive an average rainfall of 1200mm per annum, mainly grow maize, sugarcane and coffee. The reliability of rainfall across the County implies that it has high potential for growing a wide range of agricultural crops.

Most parts of Nandi County experience mean temperatures ranging between 18°C to 22°C during the rainy season; but the part adjacent to the Nyando escarpment at 1,300m above sea ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD

xiii | P a g e

level), experiences average temperatures as high as 26°C. During the dry months of December and January, the temperatures are as high as 23°C; while in the cold spell, the night temperatures drop to as low as 14°C, in the months of July and August. The County in general has moderate to warm temperatures; with no cold and hot extremes throughout the year.

Kericho County

Kericho county enjoys favorable climate and receives relief rainfall, with moderate temperatures of 170C and low evaporation rates. Temperatures range between 100C - 290C. The rainfall pattern is such that the central part of the county, where tea is grown, receives the highest rainfall of about 2,125mm p.a while the lower parts of Soin and parts of Kipkelion receive the least amount of rainfall of 1,400 mm p.a.

The county experiences two rainy seasons: the long rainy season between April and June and the short rainy season between October and December. The dry season starts in January and progresses through March although weather shocks have changed the patterns. The variations in the temperatures and rainfall are mainly determined by the altitude of the place.

Solid and Liquid Wastes

Solid Waste

Wastes generated at various levels of the community are generally disposed off into the natural environment. Most wastes generated include bio mass from crops especially from sugar cane farms and animal wastes, plastics and urban wastes from shopping centers.

Liquid Waste

The project traverses a rural area where majority of the homesteads use pit latrines with a few homes, institutions such as high schools and hospitals having septic tanks.

Noise and Vibrations

Noise and vibration is also limited to commercial and residential noise that is generally below the established standards. Transport related noise is also insignificant; the noise is below levels tolerable by human as established under the guidelines (55dBA over a period of 8hrs by day and 45dBA by night) since there are no significant sources of noise.

Flora and Fauna

Flora

The project fall within an area that has transformed from a natural landscape to human dominated landscape consisting primarily of farmlands and urban, peri urban and rural settlements. Some of the major urban settlements along the traverse include Muhoroni and Chemilil.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD xiv | P a g e

A few remnants of natural and secondary planted vegetation exist which include napier grass (Pennisetum spp)., Eucalyptus spp., Mimosa spp, Albezia caraira, Lantana camara, Phragmites australis, Musa domestica and Tithornia diversiflora. Other species present include P. australis, Psidium guajava, Mimosa spp. and Tithornia diversiflora, Psidium guajava, Ficus spp., Acacia spp. and Mimosa spp.

Fauna

Fauna species along the road include rodents (rats and mice), numerous insects, several avian species such as weaver birds, storks, cranes, fish species in the river system mainly labeos, cat fish barbell and Tilapia-(Barbus altianalis Boulenger, Labeo victorianus Boulenger, Barbus cercops Whitehead, Clarias gariepinus Burchell, Barbus nyanzae Whitehead, Barbus kerstenii Peters, Barbus jacksonii Günther, Barbus appleurograma, Oreochromis leucostictus Trewavas, Gambusia affinis Baird & Girard, and Bagrus docmak Forsskål), mongooses, frogs, toads, monitor lizards, snakes (puff adders, house snakes, water snakes and cobras)

Domesticated animals are reared dairy cattle, beef cattle, pigs, goats, sheep, poultry, rabbits and bees

Land Resources

Kisumu County

Land is the most important natural resource in the county being a source of economic, social, political and cultural development through provision of natural resources that are vital for supporting livelihood and material wealth. However, approximately 50 percent of the county's land surface is grossly underutilized with sparse or no development especially in rural areas. In addition, most of the land in the county has not been registered which hinders people from asserting their rights over land. The mean land holding size in the county is 1.6 acres while the mean agricultural parcel is 1.0 acres. The population is predominantly rural with those living in rural areas depending entirely on land as the natural resource for subsistence and economic purposes. Due to population pressure, the small parcels of land continue to be subdivided into uneconomical sizes. The main crops grown are food crop (maize, beans, rice, sorghum, green grams, sweet potatoes, cassava, tomatoes, cowpeas, kales and groundnuts), sugarcane and rice.

Nandi County

The major land types in Nandi are forests, woodlots, wetlands, rivers, open grasslands with vegetation, the Nandi escarpment, valleys and hills, tea plantations and the Kapsabet plateau. The project road has essentially a rural disposition with the local population mainly engaged in dairy and cash/subsistence farming. Land resources in the project area of importance to the project included soil/gravel and rocks. Soil/gravel and rocks are important for the project as it

will be used for formation of the Subbase for the road while the rivers will be a critical source of water for construction.

Land in Nandi County is owned by two categories namely; Freehold and lease. Freehold tenure applies to customary land which is usually put under agricultural use. Minimum Land holding size within the county depends on the use. Large scale farming especially of tea holds large chunks of land (sometimes as low as 100 acres to above 1000 acres). Small and medium scale farmers own approximately 2 acres-50 acres which are mostly used for agriculture; subsistence and commercial. Rampant subdivision of agricultural land abutting built up areas has been experienced due to urbanization process.

The main food crops produced in the region are maize, beans, Finger millet, Sorghum, Sweet potatoes and cassava which cover a total of 105, 087 Ha. The main cash crops are tea, coffee and sugar cane

Kericho County

There are two major land tenure systems in Kericho County namely the Leasehold Tenure and the Freehold Tenure. The Freehold Tenure is governed under the Land Registration Act of 2012 and is mainly utilized for farming. On the other hand, Leasehold Land Tenure system is an interest in land for a definite term of years usually 99 years renewable upon request by the proprietor. The average land holding size in the county is 0.9 ha. for the smallholders and 14 ha. for large scale holders. The large-scale holders are mostly the multinationals which utilize the land for tea and flower farming. Small scale farms are under food crop and livestock production. The main crops produced in the region are maize, beans, Finger millet, Sorghum, Sweet potatoes tea, pineapples, coffee, sugarcane, potatoes, maize and horticultural crops.

Demographics

Kisumu County

According to 2019 National Census Kisumu County has a population of 1,155,574. The population density is 550 persons per Km². The population distribution by sex is 556,942 male and ,594,609 female, intersex 23 (2019 Kenya Population and housing census.

Nandi County

Nandi County is home to over 752,965 people (50% male and 50% female), according to the 2009 National Census.

Kericho County

Kericho county has a total population of 901,777 of which 450,741 are males, 451,008 females and 28 intersex persons. There are 206,036 household with an average household size of 4.4 persons per household and a population density 370 people per square kilometre

Trade

The county has micro, small and medium size business enterprises. There are numerous registered business entities spread across different sectors in the three counties with the two major types being: Service Business: A service type of business provides intangible products. Service type firms offer professional skills, expertise, advice, and other similar products. They include salons, repair shops, schools, banks, accounting firms, and law firms, and Merchandising Business: There are several merchandizers in the county. They include supermarkets, grocery stores, convenience stores, distributors, and retailer.

Employment

There are several categories of employment in the county. The first instance is those people working in multinational companies such as sugar factories, mining, tea factories and flower farms get their dues in terms of wages. This is because most of the employees of these firms are employed under contract terms. Roads and building construction is another source though it is seasonal employment. The category is the self-employed which entails people working on their own farms. These are the people who spend most of their time engaged in tilling, harvesting and rearing livestock for their livelihood. This type of employment contributes to more than 50 percent of employment in the three counties. Other kinds of self-employment comprise of people undertaking their own businesses either in the main trading centres or in the rural settings which range from small kiosks to wholesale trading.

Education

Kisumu County

Primary and secondary education is provided by 706 primary schools and 173 public secondary schools. The enrolment in primary school and secondary school stood at 240, 538 and 38, 815 as of 2009. The teacher to pupil ratio was 1:51 for primary and 1:30 for secondary. Kisumu Polytechnic provides several technical courses for young adults and also professionals, including some diploma courses. 5 youth polytechnics also exist in various parts of the county. The county has several colleges and universities such as , Nairobi University, Maseno University , Great Lakes University and several teaching and nursing colleges.

Nandi County

Nandi County has about 744 primary schools and 155 secondary schools with about 220,000 pupils and 27,000 students respectively. The county is home to some of Kenya's best schools, including Kapsabet High School, Kemeloi Boys' Secondary, Kapsabet Girls High School, Meteitei Boys Secondary School, Samoei High School, and St. Josephs Girls, Chepterit, Cheptil

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD xvii | P a g e

Secondary School among others. Several institutions of higher learning are found here among them the University of Eastern Africa, Baraton (UEAB), Koitalel Samoei University (a constituent college of the University of Nairobi) Mosoriot Teachers College, Mosoriot and Kaptumo Medical Training Colleges and Kaiboi Technical Training Institute among other

Kericho County

There are 1054 ECD centres 803 primary schools and 229 secondary schools. The county has also 1 teachers training colleges, 6 Youth Polytechnics, 80 adult training institutions and 6 technical training institution.

Industries

Kisumu County

Kisumu County has three State-owned Sugar Milling Factories; Chemelil, Muhoroni and Miwani which unfortunately are riddled with heavy debt burden, mismanagement and obsolete machineries and one privately-owned; Kibos. There is an Agro-chemicals food processing plant in Muhoroni and East African Breweries has a plant in the county providing an opportunity to Sorghum farmers to invest in sorghum production to sustain the demand for the industry. However key textile industries such as KICOMI have since remained dormant despite the favorable agro-ecological conditions for quality cotton production. The fate is similar for the fish processing industry which has remained dormant despite the existence of the second largest fresh water lake in the world; L. Victoria

Huge potential also exists in horticulture production and processing, given agro- ecological conditions, however this remains unexploited. The County hosts Kisumu bottlers which processes, bottles, sales and distributes Coca cola products in the entire Western region. There is also numerous water bottling factories spread across the County, and several commercial quarries such as in Koru where limestone is mined.

Nandi and Kericho County

The industries in Nandi and Kericho County have a similarity due to the same agro ecological systems. There are major tea factories, a number of cottage industries in the timber lumbering, coffee, milk, honey value addition and other agro processing cottage enterprises. There are coffee factories several milk cooling plants, various collection points for sugar factories and textile apparel units.

Public participation

Public Consultations were organized through the Kisumu, Nandi and Kisumu Governor's Office, Kisumu, Nandi and Kisumu County Commissioners, MPs, chief's offices and the Business Community The invitations covered the broad spectrum of community members likely to be affected by the project within the roads corridor of influence.

Three meetings were held involving top county leadership from the National Government arem and the County Government arm. The meeting focused on the top leadership level due to the Ministry of Health guidelines on the management of Covid-19 that restricted public gatherings.

The first meeting was held on 4th June 2020 at the Kericho County Commissioners office, the Second meeting was held on 4th June at the Nandi County, Governor's Board room and the third meeting was held on 5th June 2020 at Kisumu Sunset Hotel.

In addition a set of questionnaires was utilized to gather information from members of the public due to the observance of the Ministry of Health guidelines on the management of Covid-19.

The completion of the questionnaires allowed for the synthesis and analysis of issues that arose which provided basis upon which the environmental, economic and social aspects of the ESIA was undertaken.

From the administered questionnaires a number of concerns were noted pertaining to the current state of the road key among them being the dilapidated road results in increased cost of repair of vehicles and bodabodas, increased cost of doing business due to high cost of transportation and fares to commuters, inaccessibility to health centres, increased insecurity due to lack of business opportunities as a result of limited access, some sections of the road and feeder roads are impassible during the rainy season which even because a threat to school going children. During construction the community raised a number of issue that they noted could occur which included: frequent accident from project vehicles, bodabodas and other road users due to lack of signages and maintenance of diversions, dust pollution, disruption of business especially for road side traders, delay in travel time if there is no planning of road works and diversion, and slow progress and delay in works due lack of proper planning and capacity of the contractors involved. To mitigate against the impacts it wa highlighted that there is need to properly maintain the diversions from watering and grading, install speed humps especially near centres and schools, offer employment to the locals, installation of signages, payment for disrupted and construction of market stalls.

Generally it was noted that once the road was completed it improve the living standards of the area project area as numerous business will spring up, cost of transportation and repair for motor vehicles and bodabodas would reduce, access to health facilities will be enhanced, enhanced mobility and enhanced security due to ease of doing patrols for the police.

To mitigate against all the impacts identified an ESMP has been developed. The ESMP will ensure adherence and future compliance with legislation, good environmental performance, and integration of environmental and social issues into the project decision.

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)		
Construction phase	Construction phase					
Physical and Topographic Aspects	 Slope gradient maintenance and controlled borrow pits and quarry excavation to avoid vertical faces and slopes and possible scree or mudflows during heavy rains Erosion control measures in excavated borrow pits areas and working sites along the road Site reclamation or rehabilitation after exhaustion of borrow sites, quarries and during decommissioning phase of the project. 	Contractor/KeNHA/Supervision Consultant	Continuous	As appropriate		

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Air Pollution due to Dust Generation and Air Emissions	 Sprinkling of water on dry and dusty surfaces regularly including the access roads. Add suitable soil stabilizers such as crushed aggregate stones on access roads or pave access roads to control dust. Erection of dust screens during construction especially at the workers' camps around public institutions and market centres. Dust control measures should be adopted at the concrete batching plants, providing adequate PPE to staffs, canopying loading points, erecting dust screens around the plant and covering trucks ferrying roads works materials. Instituting wet crushing at the crusher to reduce fugitive dust emission The contractor is expected to conduct separate ESIAs for the batching plants and monitor the dust levels periodically Re-vegetating exposed areas during the operation phase of the project. Sprinkling water along the diversion routes or earth along the road section. Slowing the speed of traffic by using bumps to reduce dust levels from vehicles utilizing the road during construction. 	Contractor/KeNHA/Supervision Consultant	Monthly	As appropriate
	SQCIAL IMPACT ASSESSMENT STUDY REPORT F CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY		TION TO BITUMEN STA	

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Noise Pollution 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 all the time to avoid excessive noise generation. Ensure that all workers wear ear muffs 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	Contractor/KeNHA/Supervision Consultant	Frequency/Timing Monthly	- As appropriate
	by the Environment Management and Coordination, Noise and Excessive Vibrations Pollution Control Regulations 2009.			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Possible impacts	 Support facilities such as hard rock quarries should adopt controlled blasting techniques, preventing flying rock debris and high intensity vibrations. The management should equally observe relevant explosives use and 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 all the time to avoid excessive noise generation. Ensure that all workers wear ear muffs 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 Environment Management and Coordination, Noise and Excessive Vibrations Pollution Control Regulations 2009. Support facilities such as hard rock 	Responsible party	Frequency/Timing	Budget (Kshs)
	quarries should adopt controlled blasting techniques, preventing flying rock debris			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 and high intensity vibrations. The management should equally observe relevant explosives use and blasting permits provided by the Inspector of Mines and Geology. 			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Mitigation Measures Maximizing the rate of recycling of road resurfacing waste either in the aggregate (e.g. reclaimed asphalt pavement or reclaimed concrete material) or as a base; 			
	 Provision of bottle and can trash disposal receptacles at camp, offices and parking lots during operation to avoid littering along the road. 			
	 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. 			
Waste Management (Solid aand Liqud	 Develop and implement a Construction Waste Management Plan before start of the project. 	Contractor/KeNHA/Supervision Consultant Monthly	Monthly	-As appropriate
effluent)	• complying with provisions of the Environmental Management and Coordination, Waste Management Regulations 2006			110 appropriate
	 Sub-contract a NEMA licensed waste handling firm to collect solid wastes on regular basis and dispose off in approved dumping sites. 			
	 Drainage outfalls should be properly constructed to be able to self-clean and 			
	CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY • Establishment of functional domestic	FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STA		
	waste handling facilities such as septic systems, grease traps and separation of grey and black water systems			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Surface water quality	 Ensure t Drainage structures that will be constructed –cross culverts, at the river courses be at appropriate positions. Stone pitching and side drains to cover meaningful lengths along the prone protection areas. Timing of the construction of proposed bridges to coincide with dry periods when water levels in the rivers are low to avoid possible water pollution. Contractor to avoid dumping of waste materials within the riparian zones/ within the watercourses. Cement mixing trucks should be washed at designated areas only. Ensure regular maintenance of plumbing system to avoid spillage of wastewater. Discharge of partially treated sewage into septic tanks Ensure regular maintenance of plumbing system and septic tanks to avoid spillage of raw sewage. 	Contractor/KeNHA/Supervision Consultant	Monthly	- As appropriate
Soil Erosion	 Ensure surface runoff generated on impervious surface is not channeled directly to steep slopes. Provide grassed water ways along the access roads. 	Contractor/KeNHA/Supervision Consultant	continuous	-

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD xxvii |

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Construct flow breaks on roadside drainage channels. The contractor will source materials such as gravel, sand, ballast and hard core at the project locality. Consultation should be held with the community members and their representatives on the best sites to source materials and rehabilitation measures should be agreed. It is recommended that environmental impact monitoring should be conducted for such activities or in consultation with respective County Directors of Environment to ensure environmental conservation and rehabilitation after use. All exhausted quarries and borrow pits should be isolated, protected and rehabilitated to usable state before the contract closure. 			-
Loss of Vegetation Cover and Biodiversity	•	Contractor/KeNHA/Supervision Consultant/KFS/KWS	Monthly	- As appropriate
	Separate EIAs should be conducted for camps, borrow pits, quarries, boreholes (if			-

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 any) and other ancillary facilities. Minimize clearing and disruption of riparian vegetation. Provide adequate protection against scour and erosion; and consider the onset of the rainy season with respect to construction schedules. Minimize clearing of indigenous plant species and replanting of indigenous plant species in disturbed areas. Explore opportunities for habitat enhancement through reduced clearance to conserve or restoration native species. Employ vegetation rehabilitation techniques to recover lost plant cover such as Reforestation and Afforestation. The contractor is expected to comply with the National Sand Harvesting Guidelines provided by NEMA and the County Governments Undertake an inventory/ Review existing information on species and habitats in the project area. Contact appropriate agencies early in the planning process to identify potentially sensitive ecological resources that may be present in the project area. Conduct pre-disturbance surveys in order to locate site facilities away from important ecological resources (e.g., wetlands, 			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 important upland habitats, sensitive species populations). Ensure activities don't pose minimal impacts to riverine flora and fauna. Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. 			
Road Safety	 Avoid long traffic diversion roads. Water diversions to ensure dust is minimized hence easier visibility for drivers. Ensure Installation and maintenance of all construction signs, signals, markings, and other devices used to regulate traffic, including posted speed limits, warnings of sharp turns, or other special road conditions. . 	Contractor/KeNHA/Supervision Consultant	Periodically	- As appropriate
Occupational Health and Safety	 Develop and enforce a fleet management plan for road construction that includes measures to ensure work zone safety for construction workers and the travelling 	Contractor/KeNHA/Supervision Consultant	Monthly	- As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Establishment of work zones to separate pedestrians and livestock travelling by foot from vehicular traffic and equipment by routing of traffic to alternative roads where possible. Regular issuance of appropriate PPEs and regular trainings on proper use and maintenance of PPEs Conduct basic Occupational Health Training programs to construction workers during construction phase. Ensure workers are oriented to the specific hazards of individual work assignment. Conduct toolbox talks focusing on relevant health and safety issues. HIV/AIDS, STDs awareness, training and prevention services to be offered throughout the project period. A Code of Conduct should be distributed to all workers, and health personnel should reinforce their efforts to combat diseases during the construction period. Workers to be sensitized on the consequences of social ills and promiscuous behaviors (over consumption of alcohol, STDs, HIV /AIDS etc). Contractor to establish mobile clinic within the construction sites 			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
1 ossible impacts	 Use protective barriers to shield the public from vehicular traffic, regulation of traffic flow by warning lights, design of the work space to eliminate or decrease blind spots, and ensure reduction of vehicle speeds in work zones. Training of workers in safety issues related to their activities, such as the hazards of 	Responsible party	Frequency/1mmig	Duuget (Ksiis)
	working on foot around equipment and vehicles. Issuance of permits to work when undertaking hazardous tasks 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 work space (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. Working under personnel on elevated structures should be avoided. 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 			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 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. 			
Material Sites and Material Haulage	 Environmental impact assessments (EIA) to be undertaken prior to extraction of materials from identified sites and approved by NEMA. Operations of the materials sites to be guided by respective management plans established and approved under the ESIA, Material extractions and delivery should only be done during the day. If borrow pits and quarries are operated, they be fenced off. Proper handling and management of liquid effluent and used waste oil to forestall incidence of surface water bodies Any abstraction of water from the existing river systems or from boreholes should be undertaken after acquisition of the prerequisite licenses, Rehabilitation of materials sites to take place upon exhaustion (Contractors will provide appropriate rehabilitation plans for each material site). 	Contractor/KeNHA/Supervision Consultant	Quarterly	As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 If commercial material sources are adopted, the Contractor(s) should ensure due diligence process is followed by the suppliers at all times, Material extraction and haulage should be done in dump conditions to keep dust low, especially if it is located within settled areas. 			-
Soil contamination	 The waste management hierarchy will be followed during the construction phase. According to this hierarchy, source reduction of waste will be the first option and disposal of unavoidable waste as option of the last resort; Undertake routine preventive maintenance of motorised equipment to avoid any fuel leakage and spills; Storage of fuels and oils should be undertaken in a manner that does not allow leakage to the soil as the fuel can readily infiltrate the soils polluting the soils, ground and surface water; and Collect and dispose of all waste generated from project activities in accordance with EMCA (Waste Management) Regulations 2006 and international best practice The Contractor shall ensure that all wastes generated during construction activities such as conductors, steel and metallic 	Contractor/KeNHA/Supervision Consultant	Quarterly	As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 bars, insulators and other accessories are collected and disposed of appropriately at designated sites; All plastic waste generated (at campsites and in the course of undertaking works) such as mineral water bottles, polythene bags, jerry cans, will be collected preferably in mobile vans and handed over to a licensed waste collector or re used; 			
	Soil and gravel should be shaped and compacted immediately after transport to its destination. Spoil from the earthworks should be dumped in a central place and covered			
	Maintain spill kits at the contractor's garage, workshops and those areas experiencing spillages.			
	Storage of oil and tar drums should be done on concrete floors to prevent exposure of soil to contamination			
	Construction activities should be carried out during the warm seasons. This will aid in compaction of the surface material and reduce the loss of soil and gravel by storm water runoff			
	Re-vegetation of excavated areas to			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 ensure ground stability. Scour checks and stone pitching should be done on steep sections of the road to minimize erosion 			
Social Impacts	 The contractor should develop and implement labour influx plan, an employee code of conduct, child protection strategy stakeholder engagement strategy and communication strategy during the project implementation phase. The project is located in areas that are settled therefore most of the workers may end up renting accommodation in the towns and from home owners. For those who may reside in camps provided by the contractor, the camps camp will have the necessary social service amenities like health, water and sanitation facilities for the workers. 	Contractor/KeNHA/Supervision Consultant		As appropriate
Land Resources	 The materials should be sourced from borrow sites and quarries after ESIA/EIAs and rehabilitation plans are prepared and approved by NEMA; There should be adequate re-use of the excavated waste materials; Where compensation and relocation are 	Contractor/KeNHA/Supervision Consultant	Continuous	As appropriate

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD xxxvi |

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	required, land value should be determined by independent surveyor/ valuer or other component body such as the Ministry of Lands; • The explosives should not be kept on the sites; instead they should be delivered to the site as and when necessary from special storehouses managed by the contractor; • There should be adequate landscaping, backfilling and draining of the depressed areas to prevent breeding grounds for disease vectors, this should be ascertained by KeNHA or NEMA County Directors; • The borrow pits and quarries should be located more than 500 metres from the watercourses and in a position that should facilitate the prevention of storm water run-off to prevent run off from the site entering the water course • Adequate notice should be given in advance to the nearby communities of the intention to excavate the borrow pits and quarries Blasting should take place at designated times and the affected public within approximately 5km radius duly informed;			
Operational phase				

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
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 in town areas and near public institutions Install no hooting signs in sensitive areas such as near schools, etc. 	Contractor/KeNHA	Monthly	- As appropriate
Increased Generation of Storm Water	 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. Use of vegetated swales, filter strips, terracing, check dams, detention ponds or basins, infiltration trenches and infiltration basins. Repair works to be carried out in dry weather to prevent runoff of asphalt or cement materials. 	Contractor/KeNHA	Continuous	- As appropriate
Loss of human and animal life due to increased road accidents	 Install speed calming measures next to public institutions, towns and settlement Provide road signages all along the road Conduct road safety sensitization programmes. Carry out Risk Assessment to identify 	Contractor/KeNHA	Continuous	As appropriate

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD xxxviii |

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	risk areas and provide appropriate			
	prevention measures.			
	Installation and maintenance of speed			
Road Safety	control and traffic calming devices at	Contractor/KeNHA	Continuous	As appropriate
	pedestrian crossing areas.			
	• Installation and maintenance of all signs,			
	signals, markings, and other devices used			-
	to regulate traffic, specifically those			
	related to pedestrian facilities			
	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.			
	Installation of measures to reduce			
	collisions between animals and vehicles			
	(e.g. use of signs to alert drivers on road			_
	segments where animals frequently			
	cross).			
	Prepare an emergency preparedness and			
	response plan in coordination with the			
	local community and local emergency			-
	responders.			
	Comply with OSHA 2007 requirements,			
	they include;			-
	 Carrying out Safety Audits. 			-
	o Implementing DOSHS			
	improvement orders.			-
	o Carrying out EHS Risk			-

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	Assessments. • Involve all the relevant stakeholders during the audit so as to incorporate suggested EHS measures into the report.			-
Increased Generation of Solid Waste	 Maximizing the rate of recycling of road resurfacing waste either in the aggregate (e.g. reclaimed asphalt pavement or reclaimed concrete material) or as a base. Incorporating recyclable materials to reduce the volume and cost of new asphalt and concrete mixes. 	Contractor/KeNHA	Continuous	-
	 Collecting road litter or illegally dumped waste and managing it according to the recommendations in the General EHS Guidelines. Provision of bottle and can recycling and trash disposal receptacles at parking lots and bus stops to avoid littering along the road. 			- As appropriate
	 Collecting animal carcasses in a timely manner and disposing them through prompt burial or other environmentally safe methods. 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. • Management of all removed paint			-

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 materials suspected or confirmed of containing lead as hazardous waste. Grinding of removed, old road surface material and re-use in paving, or stockpiling the reclaim for road bed or other uses. Ensure implementation of the project's operation phase Waste Management Plan. Comply with EMCA Cap 387 Waste Management Regulations, 2006. 			-
Occupational Health and Safety	 When undertaking road repairs, use protective barriers to shield workers from traffic vehicles, regulation of traffic flow by warning lights, design of the work space to eliminate or decrease blind spots, and ensure reduction of maximum vehicle speeds in work zones. Training of workers in safety issues related to road maintenance activities. When undertaking road repairs, ensure safe practices for work at night and in other low-visibility conditions, including use of high-visibility safety apparel and proper illumination. When repairing the road, use asphalt product of appropriate specification and ensure application at the correct temperature to reduce the fuming of 	Contractor/KeNHA	Continuous	-

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 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. Ventilation of indoor areas where vehicles or engines are operated or use of exhaust extractor hose attachments to divert exhaust outside. Carry out Safety Audits. Implement DOSHS improvement orders. 			- As appropriate
Soil Quality Degradation	 Rehabilitate borrow areas. Revegetate cleared areas. Ensure proper drainage infrastructure along the road. Used oil and spills should be disposed in an environmental friendly manner. 	Contractor/KeNHA/Public	Continuous	As appropriate
Risk of spread of invasive species	 Reduce open gaps in road reserves by planting appropriate tree species suitable for highway or road side tree planting Monitor composition of species regenerating along road reserves and take prompt actions in case of emergence of invasive species Carry out routine road reserves 	Contractor/KeNHA/Public	Continuous	As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	maintenance mainly to clear bushes that may harbour invasive species.			
DECOMMISSIONIN	G PHASE			
Demolition waste	 Use of an integrated solid waste management system i.e. through a hierarchy of options: Source reduction Recycling Composting and reuse Combustion Sanitary land filling. All buildings, machinery, equipment, and others that will not be used for other purposes must be removed and recycled/reused as far as possible. All foundations must be removed and 	Contractor/KeNHA	at the time of decommissioning	- - - -
	recycled, reused or disposed of at a licensed disposal site. • Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site. • Donate reusable demolition waste to charitable organizations, individuals and institutions.			-
Noise and Vibration	 Sensitize workforce including drivers of construction vehicles. Install sound barriers for pile driving 	Contractor/KeNHA	at the time of decommissioning	As appropriate

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD xliii |

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Dust Emission	 activity. Install portable barriers to shield compressors and other small stationary equipment where necessary. Proper maintenance of all equipment. Workers near high level noise to wear safety and protective gear. Spray demolished piles of earth with water. Avoid pouring dust materials from elevated areas to ground. Cover all trucks hauling soil, sand and other loose materials. Provide dust screen where necessary. 	Contractor/KeNHA	at the time of decommissioning	As appropriate -
Site degradation	 Implement an appropriate re-vegetation programme to restore the site to its original status. Consider use of indigenous plant species in revegetation. 	Contractor/KeNHA	at the time of decommissioning	As appropriate

Conclusion

The reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard and associated 54kms of spur roads will play a critical role in improving the living standards of the area project area as numerous business will spring up, cost of transportation and repair for motor vehicles and bodabodas would reduce, access to health facilities will be enhanced, enhanced mobility and enhanced security due to ease of doing patrols for the police

The Environmental and social impacts associated with the proposed project road are relatively medium to minor since the road exists and the corridor for expansion is big enough to accommodate the upgrading and other related facilities.

The road project will equally have negative impacts both in the construction, operation and decommissioning phases, if appropriate mitigation and support measures are not applied. Project impacts are medium to low and most of them can be avoided or mitigated. During construction the community raised a number of issue that they noted could occur which included: frequent accident from project vehicles, bodabodas and other road users due to lack of signages and maintenance of diversions, dust pollution, disruption of business especially for road side traders, delay in travel time if there is no planning of road works and diversion, and slow progress and delay in works due lack of proper planning and capacity of the contractors involved. To mitigate against the impacts it wa highlighted that there is need to properly maintain the diversions from watering and grading, install speed humps especially near centres and schools, offer employment to the locals, installation of signages, payment for disrupted and construction of market stalls

The impacts identified are manageable through application of mitigation measures wherever they occur. The findings of the Environmental and Social Impact Assessment (ESIA) study establish that the road project will elicit positive impacts on the socio-economic environment of the area. Generally it was noted that once the road was completed it improve the living standards of the area project area as numerous business will spring up, cost of transportation and repair for motor vehicles and bodabodas would reduce, access to health facilities will be enhanced, enhanced mobility and enhanced security due to ease of doing patrols for the police.

Recommendations: The proposed project will have both positive and negative impacts. The report has strived to give comprehensive mitigation measures and environmental management and monitoring mechanisms which if put in place will minimize or completely eliminate the possible negative impacts. The environmental management and monitoring mechanisms developed in this report should be strictly adhered to, to ensure that the project remains environmentally and technically sound throughout its life.

CHAPTER 1.0: INTRODUCTION

1.1 Project Background

Kenya National Highways Authority (KeNHA) is a state corporation within the Ministry of Transport, Infrastructure, Housing and Urban Development (MoTIHUD), established under the Kenya Roads Act 2007 with the responsibility for the management, development, rehabilitation and maintenance of international trunk roads linking centres of international importance and crossing international boundaries or terminating at international ports(Class A road), national trunk roads linking internationally important centres (Class B roads), and primarily roads linking provincially important centres to each other or two higher-class roads (Class C roads). In undertaking this mandate, the Authority propels the country to achieve its infrastructure goals espoused in the vision 2030.

The Government of Kenya (GoK) through its implementing agency Kenya National Highways Authority (KeNHA) has set aside funds from Road Maintenance Levy Fund (RMLF) to be applied for use in the reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard. In addition the project will include upgrading of the 54kms of spur roads (Miwani-Ombeyi-Ahero Road -16kms, Koru Spur roads-5.5kms, Muhoroni- Sanghor-14kms, Riat Market-10kms, Mambolea-Gaseta-5.5kms, and Mamboleo-ASK Showground- Migosi-3kms). Road transport is the predominant mode of transport in Kenya, carrying approximately 93% of all cargo and passenger traffic in the country. The road network in Kenya has been established to be approximately 160,886 km long, comprising of approximately 11,189km of paved roads and 149,689km of unpaved roads. The bulk of the road network in Kenya lies within the highly populated parts of the country, providing some level of access to the rest of the country. In this regards, Kenya National Highways Authority intends to focus on optimizing the quality, timeliness, and cost effectiveness in the project implementation through the use of innovative and creative techniques and strategies to optimize the performance of the road network

The project route will serve as a much needed transport artery to foster the economic development by serving as a link from areas with high social, agricultural and economic potential.

1.2 Objectives of the ESIA

The main objective of the ESIA study was to predict, assess, and analyze the possible positive and negative environmental and social impacts that are expected during the construction, operation and decommissioning phases of the project. This was done with the aim of proposing the possible mitigation measures for the highlighted negative impacts. This

is in line with ensuring that the development does not impact negatively on the environment in terms of social, health, economic and physical (soil, air,water, flora and fauna) state of the project site. The exercise was carried out in accordance with the National Environment Management Authority (NEMA) of Kenya Environmental Impact Assessment and Audit Regulations of 2003 and EMCA, Cap 387 and international best practices.

The specific objectives were to:

- Identify all potential significant adverse environmental and social impacts of the proposed project and recommend mitigation measures;
- Ensure compliance with the environmental regulations and industry's standards;
- Generate baseline data for monitoring and evaluation of the success of the mitigation measures implemented during the project life cycle;
- Recommend cost effective measures to be implemented to mitigate against the expected impacts;
- Provide guidelines to stakeholders participating in the mitigation of adverse social impacts of the project;
- Prepare an environmental Impact Assessment Study report compliant to the Environmental Management and Coordination Act, EMCA Cap 387 and detailing findings and recommendations.

•

1.3 Terms of Reference

The terms of reference for this study entails conduction of biophysical and socio-economic and cultural baseline, identification, analysis and categorization of impacts and mitigation measures impacts. In addition it entails identification of positive impacts that are to be enhanced during the project implementation. The coverage of the study shall include, but not limited to the following aspects:

- i. The role of the project in the development plans at the national and regional level;
- ii. Assessment of direct impact on natural ecosystem, socio-economic and cultural aspects such as agriculture, trade, water use, and forestry etc;
- iii. Disturbance to vegetation, and plans for re vegetation;
- iv. The prevention of soil erosion and sedimentation of surface water bodies;
- v. The presentation of health hazards arising from ponding water and pollution of water courses and/or sources:
- vi. Measures for the rehabilitation of construction material sources such as borrow pits and quarries;
- vii. Waste management, Occupational health and safety for the construction labor units and the community:
- viii. The avoidance or reduction of visual intrusion; and
 - ix. Assessment of the impact on demographic factors and recommend measures to limit negative impact on adjacent communities and areas.

This Environmental Impact Assessment must conform to the Environmental Management and Coordination Act (EMCA), Cap 387, Section 58, and the National Environment Management Authority (NEMA) regulations of 2003.

1.4 Project Background, Overview, Justification and Objectives

1.3.1 Project Background

The works are located along the existing Kisumu – Chemelil - Muhoroni (C674) Road, which traverses Kisumu, Kericho and Nandi Counties in Nyanza region of Kenya.

The project road starts at its intersection with Kisumu – Kakamega (A1) road in Kisumu district at Mamboleo and passes through Muhoroni and terminates at km 12+600. The total estimated length of the main project road is approximately about 12.6km including dualled section of 6.5k. The dualled section starts at intersection with Kisumu – Kakamega (A1) road and terminated at Gluk km 6+500. The project also includes construction of the following feeder roads:

- i. Airport Roundabout - SOAS- Riat Market
- ii. Mamboleo Gaseta road
- iii. Mamboleo Show Ground Migosi-
- iv. Miwani-Ombeyi-Ahero Road
- v. Koru Spur roads
- vi. Muhoroni- Songhor
- vii. Riat Market

The sections project road traverses a fairly level terrain and straight alignment, level and rolling terrain with gentle curves, and mountainous with moderate radius curvature in Kisumu, Nyando, and Kericho, respectively. The road is in dilapitaed state in need of urgent intervention through rehabiliatin and reconstruction.

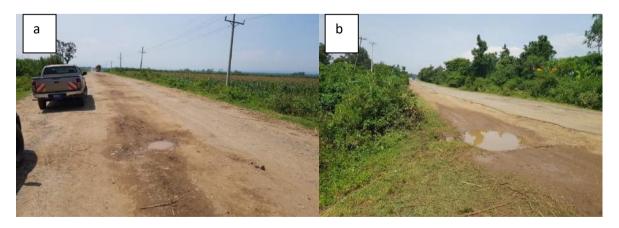


Plate 1.1: a and b Showing the current dilapitated road section

1.3.2 Project Overview

The site of the works shall be the area within the road reserve and any other places as may be designated in the Contract. The works involve construction to bitumen standard of the Mamboleo Junction- Miwani (C674) road, Spur roads and service roads at Mamboleo market centre.

The major works to be executed under the Contract comprises mainly of, but are not limited to, the following:

- i) Preliminary and General Items
- ii) For the main road;
- iii) Site clearance and top soil removal
- iv) Earthworks
 - On sections that are intact to the base layer: Scarifying the existing base, topping up with materials of minimum CBR of 23% and processing to form 200mm. Constructing an additional layer of 225mm using materials of minimum CBR 30 to form the foundation;
 - On widening sections and completely worn out sections: Processing the respective layers with materials similar to the existing pavement layers and constructing the top 200mm using materials of minimum CBR 23. Constructing an additional layer of 225mm using materials of minimum CBR 30 to form the foundation; and
 - On new construction sections: Processing the layers with materials of similar properties to the respective existing pavement layers and constructing the 200mm top subgrade with materials of minimum CBR 23%. Constructing an additional layer of 225mm using materials of minimum CBR 30 to form the foundation.
- v) Pavement Layers
 - Construction of 175mm GCS (Base Quality). This will involve scarifying the existing pavement and mixing it with gravel in processing the top Subgrade.
 - Construction of a 150mm DBM to Superpave specifications base layer running from the carriageway all through to the shoulders.
 - Construction of 50mm AC binder course to Superpave specifications to carriageway followed by a single seal surface dressing of 10/14mm chippings to the carriageway and double Seal surface dressing of 14/20 and 6/10mm chippings to the shoulders
 - Construction of Trucks & Trailers parking lots at Chemelil market centre.
 Construction of 150mm sub grade of selected material compacted to 95%
 MDD; 150mm thick cement improved (3%) sub base layer; and 200 mm thick concrete slab of class 30/20. Provision of expansion joints at every 60 metres

and construction joints at every 5 meters. Longitudinal joints provided such that slabs are not more than 4.5 meters wide.

The road carriageway shall be 7.0m wide with shoulders of 2.0m width

vi) For market access and feeder roads;

- Site clearance and top soil removal
- Earthworks
 - Fill and improved sub grade to class S4 in accordance with RDM III
- Preparation of the sub-grade to receive the pavement layers as per the specifications
- Construction of a 150 mm thick layer of cement improved (3 %) natural material sub base.
- Construction of a 150 mm thick layer of cement improved (4 %) natural material base carried through to the shoulders.
- Construction of a 50 mm thick asphalt concrete type II surfacing layer carried through to the shoulders, followed by a single seal surface dressing (10/14).
- vii) Protection works using stone pitching and gabions, as necessary.
- viii) Relocation of services, as necessary.
- ix) Provision of road furniture, including road marking and traffic signs, kerbstones and guard rails.
- x) Landscaping including top soiling and grassing.
- xi) Maintenance of passage of traffic through and around the works.
- xii) Any other auxiliary works as may be instructed by the Engineer.
- xiii) Maintenance of works during construction period of 24 months and during the defects liability period, which shall be 24 months.

The road carriageway shall be 7.0m wide with shoulders of 2.0m width. The road consists of a dual carriageway for about the first 6.5 kilometres. The side ditch shall be trapezoidal with its invert level being at least 1.0m below the road formation level.

1.3.3 Project Purpose and Objectives

The proposed reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard C674 road and associated spur road is meant to meet the following objectives and services both during construction and operation phases of the project:

- Improve the region's road network,
- Reduce travel time along and across the roads,

- Enhance the operational efficiency of the road,
- Promote economic growth within the region,
- Improve safety and reliability for all road users,
- Attract diverted traffic that will foster regional growth,
- Provide employment opportunities to local inhabitants, among other benefits

1.4 Scope of the ESIA Study

In order to identify the potential environmental and social impacts, and to come up with the proper mitigation measures for the proposed Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard and associated spur roads, the ESIA process utilized both conventional and participatory approaches.

In conducting this exercise, the following was considered:

- The reviewing of preliminary designs and alignment for the proposed project to get acquainted with environmental issues in the project site vicinity.
- The planning and preparing of a time schedule for the activities to be undertaken for the ESIA.
- Visiting the project site, and consulting with the local communities at local leaders
 and other relevant key stakeholders within counties traversed by the road. For this
 activity there was strict adherence to the Ministry of Health Guidelines on
 management of Covid-19.
- Carrying out a comprehensive assessment ensuring all environmental concerns and views of all parties/persons likely to be affected by the project are taken into consideration.
- Developing an environmental and social management plan with mechanisms for monitoring and evaluating the compliance and environmental performance, which include the cost of mitigation measures and the timeframe of implementing the measures.
- Liaising with NEMA for compliance with all mandatory and regulatory requirements relating to the ESIA.

1.5 Data collection methods and procedures

Baseline project area data was collected through a combination of methodologies as part of the Environment & Social Impact Assessment for the proposed road project. Studies of the biophysical environment provided a profile of the study area, with special emphasis on: relief, soils, climate, drainage patterns and ecological resources.

The assessment of impacts was, therefore, carried out in the following sequence:

- Qualitative and quantitative assessment of the current state of the environment in the project area;
- Identification, prediction and evaluation of positive and negative environmental impacts;
- Identification of mitigative measures for adverse environmental impacts;

The above process was augmented by:

- Review of previous reports, published and unpublished works on the environment of the study area;
- Field investigations and
- Collation of baseline data on the environmental conditions of the project area.
- Finally, formulation of an environmental management and monitoring plan based on proposals for preventive, compensatory and mitigative measures during project implementation and during the lifespan of the roads was done.

Primary data was collected through the following methods:

- Social survey of the people within the 30m road construction way leave along the project corridor.
- Formal and informal interviews and discussions with key community leaders and informants including Governors from Kisumu, Nandi and Kericho Counties, County Commissioners from Kisumu, Nandi and Kericho Counties, CECs from the Kisumu, Nandi and Kericho Counties, , Business people, and Chiefs;
- Interviews with representatives of key government agencies and regulatory bodies;
- Site walks and observations and recordings including photography along the proposed route and its vicinity.
- Finally, formulation of an environmental management and monitoring plan based on proposals for preventive, compensatory and mitigative measures during project implementation and during the lifespan of the roads was done.

It is upon these topics that possible environmental impacts of the project were evaluated. The assessment of impacts was, therefore, carried out in the following sequence:

- Qualitative and quantitative assessment of the current state of the environment in the project area;
- Identification, prediction and evaluation of positive and negative environmental impacts;
- Identification of mitigative measures for adverse environmental impacts;

Secondary data was sourced from published and un-published data as provided by the respondents and published reports and literature.

The conditions existing in and around the project area prior to the proposed project were documented to provide a baseline scenario against which possible impacts of the proposed project activities were to be assessed. The likely changes in different environmental parameters were analyzed against the established baseline information and the impacts described in both quantitative and qualitative terms. Preliminary mitigation measures were also derived for each environmental parameter.

The socio-economic impact study was handled as a discrete activity. A combination of recognized tools for assessing socio-economic impacts of such projects was employed in the study. Fieldwork, coupled with collection of existing data alongside interviews and meeting with a wide spectrum of members of the Governors, County Commissioners, Deputy County Commissioners, CECs, farmers, business community, professionals and selected institutions formed the basis of evaluating potential socio-economic impacts of the project. This allowed a situational analysis on which relationship between construction and operation of the roads against human dimensions was examined.

Public consultation was undertaken between 1st June 2020 to 5th June 2020 to disseminate information to interested and affected (stakeholders) solicit their views and consult on sensitive issues. The output is incorporated in the development of mitigation measures as provided by the Environment Management Plan.

Two key stakeholders were identified for this purpose:

- 1. Primary stakeholders: Those who are the beneficiaries of a development intervention or those directly affected (positively or negatively) by the project, commonly referred to as Project Affected Parties (PAPs)
- 2. Secondary stakeholders: Those who influence a development or are indirectly affected by the project. These include the implementing agency, relevant government departments and local administration among others

The public participation process was also used as an avenue to inform the public representatives about the proposed project and to give the stakeholders an opportunity to express their concerns regarding possible impacts of the project and mitigation measures. Since the public consultation was undertaken between 1st June 2020 to 5th June 2020 at the peak of the Covid-19 pandemic, strict adherence to the Ministry of Health Guidelines on management of Covid-19 in relation to public gathering were observed.

1.6 ESIA Team Composition

The ESIA was undertaken by the following a team with varied expertise as indicated below:

NAME	DESIGNATIION
Mr. Walter Nyatwang'a	Team Leader/ NEMA EIA Lead Expert
Mr. Adams Muriithi	Environmental Expert - NEMA Lead Expert
Eng Joan Otike	Civil/ Highway Engineer
Richard Mogesi	Environmental Expert - NEMA Lead Expert
Rose Oloo	Sociologist
Micheal Obop	Surveyor
Njue Njiru	Land Valuer

1.7 ESIA organization and structure

Based on the existing information, the ESIA study was carried out to full completion and processing is estimated to take another 45 days from the date of undertaking.

The ESIA study as proposed above culminated with production of this Study Report designed to ensure that the proposed development complies with the Environmental Management and Coordination Act (EMCA, Cap 387). The report is organized in 10 chapters as outlined below: -

Chapter 1: Gives Background Information to the Study Describing the Objectives and the Terms of Reference.

Chapter 2: Project Description.

Chapter 3: Gives the Policy, Legal and Regulatory Framework Policy, Legal, Institutional and Administrative Framework. Study Area.

Chapter 4: Outlines the Baseline Information of the

Chapter 5: Summarizes the outcome of the Stakeholder Engagement and Public Consultations process.

Chapter 6: Project Alternatives to the Project.

Chapter 7: Grievance Redress Mechanism Identification of Potential Impacts of the Project.

Chapter 8: Analysis of Environmental Impacts

Chapter 9: Environmental and Social Management Plan (ESMP).

Chapter 10: Climate Change

Chapter 11: Concludes the findings and recaps the main recommendations.

Chapter 12 References

Appendixes

The implementation of ESMP is a core part of the project implementation from design to completion stage and is expected to be adopted by the contractor and supervising consultant with close monitoring on its adherence by KeNHA.

CHAPTER 2.0: PROJECT DESCRIPTION

2.1 Introduction

The Government of the Republic of Kenya through the Ministry of Transport, Infrastructure, Housing and Urban Development (MoTIHUD) represented by the Kenya National Highways Authority (KeNHA), Kenya Rural Roads Authority (KeRRA), and the Kenya Urban Roads Authority (KURA) being state corporations established under the Kenya Roads Act, 2007 has identified the need to upgrade to paved standards approximately 10,000 km of roads. These roads are intended to support the primary growth sectors of Commerce, Tourism, Agriculture and Rural Production, and Extractive Industries. As such, the Government of Kenya (GOK) through its road agency, Kenya National Highways Authority (KeNHA) has embarked on a pivotal infrastructure project The Government of Kenya (GoK) through its implementing agency Kenya National Highways Authority (KeNHA) has set aside funds from Road Maintenance Levy Fund (RMLF) to be applied for use in the reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard. In addition the project will include upgrading of the 54kms of spur roads (Miwani-Ombeyi-Ahero Road -16kms, Koru Spur roads-5.5kms, Muhoroni- Snghor-14 Market-10kms, Mambolea- Gaseta-5.5kms, Mamboleao-ASK Showground-Migosi-3kmsThe project is located across three counties namely Kisumu, Kericho and Nandi.

2.2 Project Details

The intended reconstruction and rehabilitation project will enhance accessibility for socioeconomic development.

The works are located along the existing Kisumu – Chemelil - Muhoroni (C674) Road, which traverses Kisumu, Kericho and Nandi Counties in Nyanza region of Kenya.

The project road starts at its intersection with Kisumu – Kakamega (A1) road in Kisumu district at Mamboleo and passes through Muhoroni and terminates at km 12+600. The total estimated length of the main project road is approximately about 12.6km including dualled section of 6.5k. The dualled section starts at intersection with Kisumu – Kakamega (A1) road and terminated at Gluk km 6+500. The project also includes construction of the following feeder roads:

- i. Airport Roundabout - SOAS- Riat Market
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- iv. Miwani-Ombeyi-Ahero Road
- v. Koru Spur roads
- vi. Muhoroni- Songhor
- vii. Riat Market

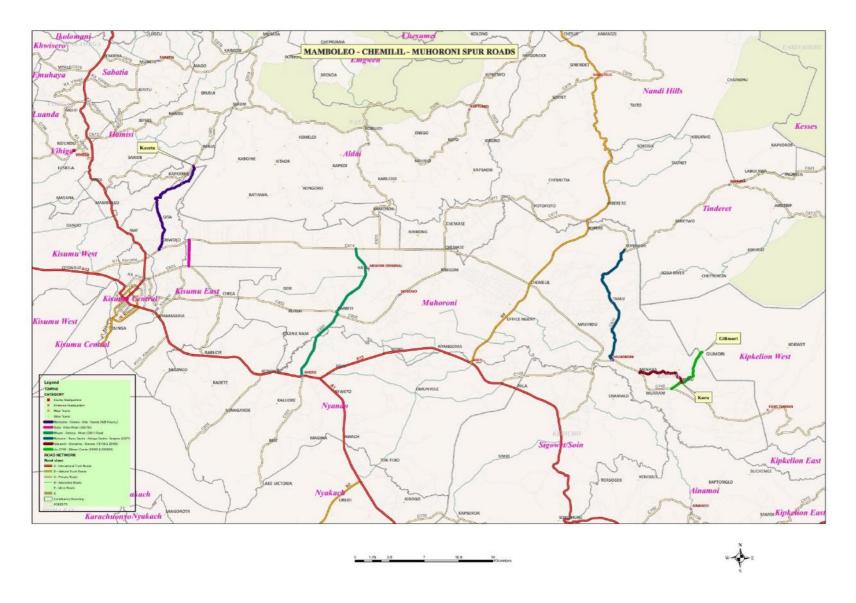


Figure 1.1: Showing Map of the project road and associated feeder roads

2.3 Project activities and processes

The site of the works shall be the area within the road reserve and any other places as may be designated in the Contract. The works involve construction to bitumen standard of the Mamboleo Junction- Miwani (C674) road, Spur roads and service roads at Mamboleo market centre.

The major works to be executed under the Contract comprises mainly of, but are not limited to, the following:

- i) Preliminary and General Items
- ii) For the main road;
- iii) Site clearance and top soil removal
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 - On widening sections and completely worn out sections: Processing the respective layers with materials similar to the existing pavement layers and constructing the top 200mm using materials of minimum CBR 23.
 Constructing an additional layer of 225mm using materials of minimum CBR 30 to form the foundation; and
 - On new construction sections: Processing the layers with materials of similar properties to the respective existing pavement layers and constructing the 200mm top subgrade with materials of minimum CBR 23%. Constructing an additional layer of 225mm using materials of minimum CBR 30 to form the foundation.

v) Pavement Layers

- Construction of 175mm GCS (Base Quality). This will involve scarifying the existing pavement and mixing it with gravel in processing the top Subgrade.
- Construction of a 150mm DBM to Superpave specifications base layer running from the carriageway all through to the shoulders.
- Construction of 50mm AC binder course to Superpave specifications to carriageway followed by a single seal surface dressing of 10/14mm chippings to the carriageway and double Seal surface dressing of 14/20 and 6/10mm chippings to the shoulders
- Construction of Trucks & Trailers parking lots at Chemelil market centre.
 Construction of 150mm sub grade of selected material compacted to 95%
 MDD; 150mm thick cement improved (3%) sub base layer; and 200 mm thick
 concrete slab of class 30/20. Provision of expansion joints at every 60 metres
 and construction joints at every 5 meters. Longitudinal joints provided such
 that slabs are not more than 4.5 meters wide.

The road carriageway shall be 7.0m wide with shoulders of 2.0m width

vi) For market access and feeder roads;

- Site clearance and top soil removal
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 - Fill and improved sub grade to class S4 in accordance with RDM III
- Preparation of the sub-grade to receive the pavement layers as per the specifications
- Construction of a 150 mm thick layer of cement improved (3 %) natural material sub base.
- Construction of a 150 mm thick layer of cement improved (4 %) natural material base carried through to the shoulders.
- Construction of a 50 mm thick asphalt concrete type II surfacing layer carried through to the shoulders, followed by a single seal surface dressing (10/14).
- vii) Protection works using stone pitching and gabions, as necessary.
- viii) Relocation of services, as necessary.
- ix) Provision of road furniture, including road marking and traffic signs, kerbstones and guard rails.
- x) Landscaping including top soiling and grassing.
- xi) Maintenance of passage of traffic through and around the works.
- xii) Any other auxiliary works as may be instructed by the Engineer.
- xiii) Maintenance of works during construction period of 24 months and during the defects liability period, which shall be 24 months.

The road carriageway shall be 7.0m wide with shoulders of 2.0m width. The road consists of a dual carriageway for about the first 6.5 kilometres. The side ditch shall be trapezoidal with its invert level being at least 1.0m below the road formation level.

2.4 Project cost

The total estimated cost for reconstruction and rehabilitation of the Mamboleo-Miwani-Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard and associated spur roads is KES 12,000,000.00

CHAPTER 3.0: POLICY, LEGAL AND REGULATORY FRAMEWORK

3.1 Introduction

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 Impact Assessments (EIAs) are carried out for new projects and environmental audits on existing facilities as per the requirements of the Environmental Management and Coordination Act (EMCA, Cap 387). Projects subject to this requirement are specified in the Second Schedule of the EMCA, Cap 387.

In Kenya, it is a legal requirement that any proposed project of the scale described in this report should undergo an Integrated Environmental and Social Impact Assessment. These requirements are stipulated in the Environmental Management and Coordination Act (EMCA, Cap 387) and EIA/EA Regulations 2003. This section outlines the Policy, Legal and Institutional framework pertaining to the proposed road development project.

3.2 Policy and institutional framework

3.2.1 The Constitution of Kenya of 2010

The Constitution of Kenya has taken onboard various issues that are related to environmental management. Article 42 of the Bill of Rights contained in the Constitution provides that 'every Kenyan has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures'.

Chapter 5 of the Constitution is dedicated to 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 Resettlement Action Plan among others.

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

3.2.2 National policy framework

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

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

To achieve the above 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.

a. Sessional Paper No. 10 of 2012 on Kenya Vision 2030

Kenya Vision 2030 is a comprehensive national development plan for period 2008 to 2030. The plan was developed following successful implementation of the Economic Recovery Strategy for Wealth and Employment Creation which ensured the country's economy was back on the path for realization of rapid economic growth since 2002. The county's GDP growth rose from 0.6% to 7% in 2007, but declined to 1.7% and 1.8% in 2008 and 2009, respectively. The objective of the Vision 2030 is to transform Kenya into a middle-income country with a consistent annual economic growth of 10 % by the year 2030. The 2030 goal for urban areas is to achieve "a well-housed population living in an environmentally-secure urban environment." This goal is expected to be achieved by developing basic infrastructure services such as roads, street lights, water and sanitation facilities, storm water drains, footpaths, and others while ensuring that the country has a clean, secure and sustainable environment by 2030 through reduction of pollution and improvement of waste management. The proposed road project will contribute to the realization of the goals of Vision 2030 through improvement of a reliable and efficient road infrastructure facility, provision of employment opportunities, and provision of faster and efficient mode of transport, among others.

b. Environment and Development (Sessional Paper No. 6 of 1999)

The Kenya's policy paper on the Environment and Development was formulated in 1999. The policy defined approaches that will be pursued by the Government in mainstreaming environment into development. The policy harmonized environmental and developmental objectives with the broad goal of achieving sustainable development. The policy paper also provided guidelines and strategies for government action regarding environment and

development. In regard to wildlife, the policy reemphasized government's commitment towards involving local communities and other stakeholders in wildlife conservation and management, as well as developing mechanisms that allow them to benefit from the natural resources occurring in their areas. The policy also advocated for the establishment of zones that allow for the multiple use and management of wildlife. This policy is relevant to the proposed development project in view of the potential impacts on the environment and involvement of the public in project planning.

c. Sessional Paper No. 10 of 2014 on the National Environment Policy

The policy seeks to provide the framework for an integrated approach to planning and sustainable management of natural resources in the country. It recognizes the various vulnerable ecosystems and proposes various policy measures not only to mainstream sound environmental management practices in all sectors of society throughout the country but also recommends strong institutional and governance measures to support achievement of desired objectives and goals.

d. National Environmental Action Plan (NEAP) of 2009-2013

The 1992 Earth Summit held in Rio de Janeiro came up with various recommendations, among them Agenda 21, a Global Environmental Action Plan. The theme of the Summit focused on how nations could attain sustainable development. The Government of Kenya embraced this idea by developing the first National Environment Action Plan (NEAP) in 1994. The NEAP report addresses environmental issues from various sectors in an integrated manner and their significance in development planning. It proposed a strategy for achieving sustainable development in line with Kenya's quest to meet the Millennium Development Goals (MDGs), Vision 2030 and Medium-Term Plan (MTP). The report brings out several proposed interventions, legal and institutional framework to be incorporated into sectoral development plans and programmes. Its implementation is monitored through the Annual State of the Environment Reporting.

e. The National Poverty Eradication Plan (NPEP) of 1999

The National Poverty Eradication Plan (NPEP) was formulated with an objective of reducing the high levels of poverty in Kenya by 50 percent by the year 2015, as well as to strengthen the capabilities of the poor and vulnerable groups to earn income. The plan also aimed at reducing gender and geographical disparities in order to create a healthy, better-educated and more productive population. The formulation of the plan was guided by the goals and commitments agreed during the World Summit for Sustainable Development (WSSD) of 1995. The plan therefore focuses on the delivery of four WSSD themes of poverty eradication; reduction of unemployment; social integration of the disadvantaged people and creation of an enabling economic, political, and cultural environment through development of transport and communication sector. The plan is implemented by the Poverty Eradication Commission (PEC) that was established in collaboration with various Government Ministries, bilateral and multilateral donors, the private sector, Community Based Organizations (CBOs) and Non-Governmental Organizations (NGOs). The NPEP is relevant since the proposed road will create an enabling environment that will contribute immensely

in the enhancement of economic growth in Kenya. The proposed project would also impact businesses, agricultural and tourism related activities that have great relevancy to poverty eradication in the country.

f. The Poverty Reduction Strategy Paper (PRSP) of 2000

The Poverty Reduction Strategy Paper (PRSP) for Kenya has the broad objective of reducing 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 Kenyans and will therefore contribute directly towards the realization of the broad national goal of reducing poverty in the country. In addition, the project would stimulate economic development by creating an enabling environment for other key sectors of the economy to thrive.

g. The National Biodiversity Strategy of 2000

The National Biodiversity Strategy and Action Plan (NBSAP) was formulated 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 general objectives of the strategy are to conserve Kenya's biodiversity; to sustainably use its components; to fairly and equitably share the benefits arising from the utilization of biological resources among the stakeholders; and to 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 since the project may lead to loss of biodiversity in some sections along the proposed route e.g. The Aberdares Forest Complex

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

The Land Policy in Kenya is guided by the environmental management principles which are aimed at restoring the environmental integrity through introduction of incentives and encouragement of use of technology and scientific methods for soil conservation, among others. The policy further requires fragile ecosystems to be managed and protected by developing a comprehensive land use policy bearing in mind the needs of the surrounding communities. The policy also requires zoning of catchment areas to protect them from degradation and establishment of participatory mechanisms for sustainable management of fragile ecosystems. The policy also called for development of procedures for co-management and rehabilitation of forest resources while recognizing traditional management systems and sharing of benefits with contiguous communities and individuals. Lastly, all national parks, game reserves, islands, front row beaches and all areas hosting fragile biodiversity are declared as fragile ecosystems under the policy.

The policy recognizes that sustainable management of land based natural resources depends largely on the governance system that defines the relationships between people, and between people and resources. To achieve an integrated approach to management of land-based natural resources, all policies, regulations and laws dealing with these resources need to be harmonized with the framework established by the Environmental Management and Coordination Act (EMCA Cap 387).

The policy also addresses land management particularly in Section 3.4.3.2 on ecosystem protection (including wetlands). Measures for protection are required for fragile ecosystems. The policy also calls for the protection of watersheds, lakes, drainage basins and wetlands. The policy prohibits settlement and agricultural activities in water catchment areas and calls for identification, delineation and gazettement of all water courses and wetlands.

i. Forestry Policy of 2014

This policy of the government is intended to ensure forests in the country are protected from wanton destruction. The goal of the policy is to increase the area under forest to 10% of the total land area in the country. The proposed road project will therefore be required to be consistent with the Kenya's forest policy. Where clearance of forests or sections of forests is envisaged, it would be important to put in place appropriate mitigation measures such as those specified in the preliminary environmental management plan of this ESIA report.

j. Wildlife Policy of 2011

The wildlife policy is aimed at promoting protection and conservation of wildlife in Kenya, both in protected and non-protected areas. The policy is implemented by the Kenya Wildlife Service (KWS). The proposed road project will need to be consistent with this policy. Where wild animals will be disturbed during the construction and operation of the road, appropriate mitigation measures must be implemented to minimize disturbance to wildlife.

k. Wetlands Policy of 2013

The wetlands policy is intended to promote protection of wetlands in Kenya. The policy sets out strategic measures for the protection of existing wetlands in Kenya. The proposed road has potential of impacting some local wetlands. It would be important to undertake appropriate mitigation measures to minimize or avoid degradation of wetlands.

l. Physical Planning Policy

The current policy governs the development and approval all building plans as provided for in the Physical Planning Act (Cap 286). The proposed project will be subjected to the provisions of this policy and legislation.

m. Public Health Policy of 2014

The public health policy calls upon the project proponents to ensure that buildings are adequately provided with utilities so that they are fit for human habitation. The workers camps must be provided with all amenities/utilities that are essential for safeguarding public health for all people using the facilities.

n. Occupational Health and Safety Policy of 2012

This policy is intended to protect safety and health of workers in work places. The proposed road project will provide employment opportunities to many workers at various categories. The contractor will be expected to comply with the requirements of this policy when engaging workers in various construction activities. The preliminary environmental management provides mitigation measures that can be undertaken to ensure compliance with the requirements of this policy.

o. HIV/AIDS Policy of 2009

The policy identifies HIV/AIDS as a global crisis that constitutes one of the most formidable challenges to development and social progress. The Pandemic heavily affects the Kenyan economy through loss of skilled and experienced manpower due to deaths, loss of man hours due to prolonged illnesses, absenteeism, reduced performance, increased stress, stigma, discrimination and loss of institutional memories, among others. Due to the large of number of workers who will be involved in the project and the associated social issues with projects of such as scale, HIV/AIDS has been considered as one of the proposed impacts, but adequate mitigation measures have also been proposed to that effect.

p. Kenya National Policy on Gender and Development (NPGD), 2000

The purpose of the Gender Policy is to institutionalize The Kenya National Policy on Gender and Development (NPGD), within Gender, Children and Social Development. It articulates the policy approach of gender mainstreaming and empowerment of women at the ministry level. The policy seeks a society where women, men, children and persons with disabilities enjoy equal rights, opportunities and a high quality of life. This report has in depth addressed matters to do with gender and development and in the concession period the entire project period the project shall be governed under this principle.

q. The Kenya National Climate Change Response Strategy of 2010

This strategy provides measures that the Government of Kenya is taking to address issues related to the impact of climate change on various sectors of the economy. The proposed road will need to take onboard the effects of changing climate in the country and apply applied climate change mitigation measures. This is important because climate change will in future affect the operation of the road.

r. KeNHA's Environment and Social Safeguards Policy, 2018

The revised policy is set within KeNHA Vision of quality, safe and adequate National Trunk Roads network. It contains the actions KeNHA will take so as to ensure that the Authority activities don't negatively harm the environment and adversely affect the social fabric in communities where it works. Working in an environmentally and socially responsible and safe manner are conditions of employment of contractors for various projects. This policy is therefore targeting the contractors and other service providers.

3.2.3 Environmental Guidelines

In line with the Kenyan Constitution, NEMA has developed a number of guidelines which are part of a series of environmental management tools for environmental management in Kenya under the Environmental Management and Coordination Act, CAP 387 of the Laws of Kenya. Below is a highlight of the key project relevant guidelines;

a. National Solid Waste Management Strategy, NEMA, 2014.

NEMA developed the National Solid Waste Management Strategy in 2014 as a framework for implementing the Vision 2030 flagship project. The Strategy establishes a common platform for action between stakeholders to systematically improve waste management. It introduces a new approach for improved waste management in Kenya to create wealth, employment and reduce pollution of the environment.

The proposed road project is anticipated to produce waste; the proponent will be required to manage waste as guided by this strategy but in line with Waste Management regulations of 2006 and other relevant legislative frameworks. In general, the project proponent should ensure waste management activities are 7R oriented, by Reducing; Rethinking; Refusing; Recycling; Reusing; Repairing and Refilling waste.

b. Technical guidelines on the management of used oil and oil sludge in Kenya (NEMA, 2014)

The main objective of the guidelines is to ensure effective and efficient collection and transportation systems for used oil. These guidelines target government agencies (responsible for decision making, formulating policies and enforcing health and safety aspects of used oil and oil sludge management in the country), small generators, bulk generators of used oil and oil sludge, garages, used oil treatment plants, recycling and disposal facilities, and other interested stakeholders. The Proponent is envisioned to use heavy machinery which will require servicing hence producing used oil. These guidelines provide direction on safe management of used oil and oil sludge in Kenya and are a main regulatory reference material for management of used oil in Kenya and hence will be used as a key reference point to create awareness on hazards associated with handling used oil and to provide guidance on infrastructure for management of used oil.

c. National sand harvesting guidelines, 2007

These Guidelines apply to all sand harvesting activities in Kenya. This is deemed key to ensure sustainable utilization of the sand resource and proper management of the environment. Since the road project will require use of sand, it is expected that the contractor's sand harvesting activities will be conducted in line with respective legal requirements and guided by these sand harvesting guidelines.

3.3 National environmental legal framework

The Republic of Kenya has numerous statutes that guide environmental management and conservation in the country. Most of these statutes 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.

3.3.1 Environmental Management and Coordination Act (EMCA, Cap 387)

The Section Part VI of EMCA, Cap 387 Part II states that every person is entitled to a clean and healthy environment and has the duty to safeguard the same. To achieve this goal, the projects listed under the Schedule No. 2 of EMCA must be subjected to Environmental Impact Assessment (EIA). The aim of EIA is to reduce negative environmental outcomes of the listed projects by implementing mitigation measures. The proposed project falls within the Second schedule and must therefore comply with EMCA requirements in as far as EIA is required. There are also several regulations that have been formulated within the framework of EMCA, Cap 387 that are applicable to the proposed project.

Under EMCA, Cap 387 NEMA has gazetted legal tools that govern conduct of EIAs and general environmental protection. The Proposed Road project has been screened against these tools with results outlined in the table 4.1 below. Detailed analysis of the trigger mechanism and modalities for mitigation are provided in Chapter 7 of this report.

Table 1.1: Analysis of Key EMCA, 1999 Relevant Regulations

Legal Tool	Status	Trigger mechanism/ Relevance to the project
Environmental Management and Co-ordination (Environmental Impact Assessment and Audit) Regulations, 2003		ESIA Study must conform to these rules. The proposed project must comply with the requirements of the regulations that also include conducting continuous monitoring and annual audits on the proposed project.
Environmental Management and Co-ordination (Waste Management Regulations, 2006)	Triggered	Construction of the project will generate solid waste hence proper disposal of wastes will need to be observed by the contractor in key areas such as workers camps and the road works.
Environmental Management and Co-ordination (Water Quality) Regulations, 2006		Water for construction will be drawn from Rivers and boreholes and there will also be work over rivers when constructing bridges and box culverts
Environmental Management and Co-ordination (Fossil Fuel Emission Control) Regulations, 2006		There will be use of vehicles, machinery and equipment that depend on fossil fuel as their source of energy hence contractor must comply with emission levels as highlighted by the regulations.
Environmental Management and Co-ordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006		The proposed road traverses' areas with diverse ecosystems which will need to be protected as per the requirements of this regulation.
Environmental Management and Coordination (Air Quality) Regulations 2014		Construction activities, construction crew and facilities such as asphalt and concrete batching plants and quarries are likely to cause air pollution. The Proponent shall implement the mitigation measures proposed to comply with the provisions of these Regulations.

OCTOBER 2020

Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007	The project contractors will need to ensure that the requirements of this regulation are observed to ensure that equipment, machinery, vehicles and chemicals containing controlled substances are not imported into the country for use in the proposed project
Environmental Management and Co-ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009	The road crosses the wetlands, and river banks which are valuable water resources along the route. The contractor will need to employ measures for the preservation and conservation of these wetlands and river systems.
Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009	The project will involve use of heavy earthmoving equipment and trucks which can generate excessive noise and vibrations. The contactor of the road will have to ensure that no excessive noise and vibrations are made during the construction of the road.

Specifications of these guidelines will be captured in the Contracts for Construction to ensure that contractors are legally bound to undertake mitigation alongside general construction work. The EMCA, Cap 387 regulations likely to be triggered and their relevance in the proposed construction of the road are further reviewed below.

a. Environmental Management and Co-ordination (Environmental Impact Assessment and Audit) Regulations, 2003

The Environmental (Impact Assessment and Audit) Regulations provides guidelines for conducting EIA studies. 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 proposed project must comply with the requirements of the regulations that also include conducting continuous monitoring and annual audits on the proposed project. The project requires an EIA license from NEMA before commencement of any activity.

b. Environmental Management and Co-ordination (Water Quality) Regulations, 2006

The EMCA (Water Quality) Regulations, 2006 provide guidelines on the use and management of water sources 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 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.

Everyone is required to refrain from any actions, which directly or indirectly cause water pollution, whether the water resource was polluted before the enactment of the Environmental Management and Coordination Act (EMCA Cap 387). 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.

c. Environmental Management and Co-ordination (Fossil Fuel Emission Control) Regulations, 2006

The EMCA (Fossil Fuel Emission Control) Regulations, 2006 aims at eliminating or reducing emissions emitted from internal combustion engines to acceptable levels. 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 would be use of vehicles, machinery and equipment that depend on fossil fuel as their source of energy. The requirements of the regulation must be implemented to eliminate or reduce air quality degradation. Sections of the regulation citing the standards of recommended emission

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 71 | P a g e

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

d. Environmental Management and Co-ordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006

The EMCA (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 provides 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 to ensure its regeneration and maximum sustainable yield. The proposed road traverses' areas with diverse ecosystems which will need to be protected as per the requirements of this regulation.

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

The Waste Management Regulations are basically aimed at streamlining the handling, transportation and disposal of various types of wastes. The broad goal of the regulations is to protect human health and the environment. The regulations place emphasis on waste minimization, cleaner production and segregation of waste at source. The regulations have also classified various types of waste and recommended appropriate disposal methods for each waste type. Under the regulations, NEMA is supposed to licenses transporters, incinerators, landfills, composers, recyclers and transfer stations. Facilities to be licensed include local authorities, transporters and handlers of various types of waste. The licensing employs a risk-based approach by concentrating on facilities considered to pose a high risk to the environment. The regulations also provide an opportunity for investment in various aspects of waste management. During the construction of the proposed road, proper disposal of wastes will need to be observed by the contractor at the workers camps and the road works. This will ensure good hygiene and healthy working environment for workers. All waste collectors/ handlers will be required to have relevant permits/ licenses from NEMA.

f. Environmental Management and Co-ordination (Controlled Substances) Regulations, 2007

The EMCA (Controlled Substances) Regulation is aimed at controlling the production, consumption and, exports and imports of controlled substances. Controlled substances are grouped into three lists as indicated below:

- Group 1 list consists of halogenated flouro-chemicals with ozone depleting substances.
- Group 2 list consist of hydrobromoflourocarbons with ozone depleting substances.
- Group 3 list consist of bromochloromethane with ozone depleting substances.

Products containing controlled substances include air conditioners, air coolers, refrigerants, portable fire extinguishers, heat pump equipment, dehumidifiers, insulation boards, panels and pipe covers, pre-polymers, etc. The project contractors will need to ensure that the requirements of this regulation are observed to ensure that equipment, machinery, vehicles and chemicals containing such components are not imported into the country for use in the proposed project.

g. Environmental Management and Co-ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009

The Environmental Management and Co-ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009 applies to all wetlands in Kenya whether occurring in private or public land. The objectives of the regulations are to provide for the conservation and sustainable use of wetlands and their resources in Kenya and promote the integration of sustainable use of resources in wetlands into the local and national management of natural resources for socio-economic development. The act also aims at ensuring the conservation of water catchments and the control of floods and the sustainable use of wetlands for ecological and aesthetic purposes for the common good of all citizens. The act also makes provision for the protection of wetlands as habitats for species of fauna and flora. It also provides a framework for public participation in the management of wetlands.

The Act requires wetland resources to be utilized in a sustainable manner compatible with the continued presence of wetlands and their hydrological, ecological, social and economic functions and services. The Act requires special measures to be undertaken to preserve and maintain knowledge innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity in wetlands.

The regulation also calls for sustainable use of wetlands through integration into the national and local land use plans to ensure sustainable use of wetlands in the country. The proposed roads pass through numerous rivers which are valuable water resources along the route. The contractors will need to employ measures for the preservation and conservation of these wetlands and river systems.

h. Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009

The Noise and Excessive Vibration Pollution Control Regulations, 2009 prohibits excessive noise and vibration. It states that no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. The contactor of the road 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 new road will involve use of heavy earthmoving equipment and trucks which can generate excessive noise and vibrations. Motor 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

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 73 | P a g e

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. Noise permits may be required in blasting areas.

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

The objective of this regulation is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources, including as mobile sources (e.g. motor vehicles) as outlined in the Environmental Management and Coordination Act, Cap 387. It also covers any other air pollution source as may be determined by the Minister in consultation with the Authority.

Emission limits for various areas and facilities have been set. In specific, first schedule of the regulations sets the emission limits of particulate matter for persons operating construction equipment or handling construction material. The regulations provide the procedure for designating controlled areas, and the objectives of air quality management plans for these areas. The Proponent for the road project shall observe policy and regulatory requirements and implement the mitigation measures proposed in this document to comply with the provisions of these Regulations on abatement of air pollution.

3.3.2 The Wildlife Management and Conservation Act 2013

The Wildlife and Conservation Act deals with the conservation and management of wildlife in Kenya. The Act provides that wildlife should be conserved to yield optimum returns in terms of cultural, aesthetic, scientific and economic benefits. The Act requires that full account be taken of the inter-relationship between wildlife conservation and land use. The Act controls activities within the national parks, which may lead to the disturbance of wild animals. Unauthorized entry, residence, burning, damage to objects of scientific interest, introduction of plants and animals and damage to structure are prohibited under this law.

The proposed road traverses' next to an important wildlife area the Aberdares forest ranges. The road construction will need to make provisions for the free passage of wildlife. Passage provisions will need to be integrated into the design of the road. The contractor will also need to provide free wildlife passages such as culverts so that the road project does not affect wildlife negatively. KWS shall be consulted on the best road signage and infrastructure that may be required.

3.3.2 Forest Conservation and Management Act, 2016

The Forest Conservation and Management Act, 2016 gives effect to Article 69 of the Kenyan 2010 Constitution about forest resources; to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country and for connected purposes. The Act applies to all forests on public, community and private lands. The principles of the Act lay emphasis on (a) good governance in accordance with Article 10 of the Constitution; (b) public

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 74 | P a g e

participation and community involvement in the management of forests; (c) consultation and co-operation between the national and county governments; (d) the values and principles of public service in accordance with Article 232 of the Constitution; (e) protection of indigenous knowledge and intellectual property rights of forests resources; and (f) international best practices in management and conservation of forests. 5. Public Forest Policy (1) The Cabinet Secretary shall, in consultation with the county government. Further, the act forms the baseline to develop a national forest policy and formulate a public forest strategy for the sustainable use of forests and forest resources. In addition, the Act, establishes the Kenya Forest Service to conserve, protect and manage all public forests in accordance with the provisions of this Act.

The road project traverses' patches of urban and farm forestry, it is therefore important to ensure community participation as provided for under the Act. The most appropriate would be initiation of participatory forest management in these forest sections so that the local community can have a significant input with Kenya Forest Service (KFS) office playing a coordination role. No trees along the route will be cut before necessary permits are obtained from KFS or county governments.

3.3.3 The Water Act **2016**

The Water Act No. 43 of 2016 was assented to on 20th September 2016. The new Act repealed the water Act 2002. The enactment of this law aimed at aligning national water management and water services provision with the requirements of the Constitution of Kenya 2010 particularly on the clauses devolving water and sanitation services to the county governments. Consequently, the new law retained some and established other new institutional arrangements including, Ministry of Water and Irrigation as the sector coordinator, Water Services Regulatory Board (WASREB) for regulation of water services' providers, Water Resources Regulatory Authority (WRA formerly WRMA) for water resource use regulation, National Water Harvesting and Storage Authority for major water infrastructural development, Water Tribunal for dispute resolution, Water Sector Trust Fund for water services development towards the un-served and poor segments of the society in peri-urban and rural areas, Water Works Development Agencies to replace the Water Service Boards, and Basin Water Resources Committees to replace Catchment Advisory Committees (CAACs)

The Act vests provision of water and sanitation services with the county governments through Water Services Providers (WSPs) whose operations must be in accordance with a Service Agreement entered between each WSP and WASREB.

The Act stipulates that a permit shall be required in all cases of proposed diversion, abstraction, obstruction, storage or use of water, with minor exceptions relating to use for domestic purposes (Section.36). Under the Water Act (General) Rules, it is stated that any rights acquired under the permit are subject to the Public Health Act and the Malaria Prevention Act, in addition to the Water Act itself. The Public Health Act has wide-ranging provisions on pollutant discharges, which are set out below.

The Water Act (General) Rules make provision for discharges in a number of respects, as follows:

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 75 \mid P a g e

Effluent shall not be returned to any body of water unless it has been purified. Further, it must not contain poisonous or injurious matter or excess silt, gravel or boulders.

Water used for pulping, mulling or washing of coffee shall be efficiently screened.

In line with earlier Acts, Section 36 provides that a permit is required for regulation of water rights and works. A permit is therefore required for any of the following purposes;

- (a) any use of water from a water resource, except as provided by section 37;
- (b) the drainage of any swamp or other land;
- (c) the discharge of a pollutant into any water resource; and
- (d) any other purpose, to be carried out in or in relation to a water resource,

It is however notable that there are instances when a permit is not required. These include the same as before: (a). abstraction or use of water, without the employment of works; from any water resource for domestic purposes by any person having lawful access to the water resource; (b). abstraction of water in a spring which is situated wholly within the boundaries of the land owned by any one landholder and does not naturally discharge into a watercourse; abutting on or extending beyond the boundaries of that land; or (c). storage of water in, or the abstraction of water from a reservoir constructed for the purpose of such storage and which does not constitute a watercourse for the purposes of the Act.

The regulating authority may determine the potential prejudicial effects of the pollutant discharges and order the removal already made. It is an offence to allow effluent discharges, either domestic or industrial, if this would harm fish, and a fish warden may order its removal. Plans for rendering such effluent innocuous shall be submitted to and approved by the enforcing authority.

Additionally, the applicant for a water permit is required to outline the methods to be used for treating effluent before discharge (Form WAB 13, question 18). The permit would only be issued subject to satisfactory provision being made for the treatment of effluent. The Water Act, apart from the Rules, makes only limited provision for controlling water pollution. The provision is limited to the pollution of drinking water.

Under section 145, the water undertaker may make regulations to control polluting activities, which may threaten its source of water. It may itself construct the necessary works for intercepting, treating or disposing of foul water (s.149). Section 158 makes it an offence to pollute such waters. Similarly, under section 169, it is an offence to throw or convey polluting matter into a body of water. All project boreholes and direct extraction from the rivers will require permits from WARMA.

3.3.4 The Agriculture, Fisheries and Food Authority Act of 2013

Agriculture, Fisheries and Food Authority Act, 2013 (No. 13 of 2013) provides for the establishment of the Agriculture, Fisheries and Food Authority, the administration of matters of agriculture and the preservation, utilization and development of agricultural land and related matters. "Agriculture" in this Act means cultivation of land and the use of land and water for any purpose of husbandry, aquaculture and food production and includes cultivation

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 76 | P a g e

of crops and horticultural practice, breeding of aquatic animals and plants, the use of land, fish harvesting and (e) the use of land for agroforestry.

The Act requires the Authority in consultation with the county governments to among others promote best practices. The Cabinet Secretary is required under the Act with the advice of the Authority, and in consultation with the National Land Commission, to provide general guidelines applicable in respect of any category of agricultural land. These land development guidelines are to be implemented by the county governments. In a like manner, the Cabinet Secretary is given powers to make general rules for the preservation, utilization and development of agricultural land and aquatic resources and prescribe national guidelines for soil conservation. Each county government is required to keep a register of land development orders and land preservation orders, which they may issue under this Act. The Act also provides for participation by farmers. This law is important because the project cuts through livestock keeping/ pastoral areas.

3.3.5 Energy Act, 2006

This is an Act of Parliament to amend and consolidate the law relating to energy, to provide for the establishment, powers and functions of the Energy Regulatory Commission and the Rural Electrification Authority, and for connected purposes. The provisions of this Act apply to every person or body of persons importing, exporting, generating, transmitting, distributing, supplying or using electrical energy; importing, exporting, transporting, refining, storing and selling petroleum or petroleum products; producing, transporting, distributing and supplying of any other form of energy, and to all works or apparatus for any of these purposes. This Act is relevant to the proposed road project due to the need to relocate some of the petrol stations situated along the route.

The Act establishes a Commission known as the Energy Regulatory Commission, that among other roles, is expected to regulate (i) importation, exportation, generation, transmission, distribution, supply and use of electrical energy, (ii) importation, exportation, transportation, refining, storage and sale of petroleum and petroleum products; (iii) production, distribution, supply and use of renewable and other forms of energy.

3.3.6 Land Act, 2012.

The Land Act was enacted by Parliament to 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 (a) public land under Article 62 of the Constitution; (b) private land under Article 64 of the Constitution; and (c) 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.

3.3.7 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. The Act requires that there is 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. With regard to 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.

3.3.8 The National Land Commission Act, 2012 (No. 5 of 2012)

The National Land Commission of Kenya is an independent government commission whose establishment was provided for by the Constitution of Kenya to, amongst other duties, 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. It was officially established under The National Land Commission Act, 2012. The mandate of the National Land Commission 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. Also, the commission is 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.

3.3.9 Community Land Act 2016

The Community Land Act, No. 27 of 2016 (the Act) came into force on 21 September 2016. The Act aims at: 1. Giving effect to Article 63 of the Constitution of Kenya, 2010 (the Constitution) which provides for a classification of land known as community land. To this end, the Constitution provides that community land shall vest in and be held by communities. 2. Providing for;

- The recognition, protection and registration of community land rights.
- The management and administration of community land.

 The role of county governments in relation to unregistered community land and related matters.

The Act repeals the Land (Group Representatives) Act (Chapter 287 of the Laws of Kenya) and the Trust Lands Act (Chapter 288 of the Laws of Kenya). This project shall uphold the requirement of all the relevant land legislations, involving key administrative stakeholders and the affected parties (i.e. the community) facilitating in coexistence with the surrounding community. Most of the land within the project route is community land. Community consultations and consent will be critical during project construction period.

3.3.10 The Environment and Land Court Act, 2011

This is an Act of Parliament to give effect to Article 162(2) (b) of the Constitution to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of land. The Environment and Land Court is one of the Courts contemplated by article 162(2). It is a Superior Court and has the same status as the High Court. The court is established under section 4 of the Environment and Land Court Act No. 19 of 2011. It has jurisdiction to hear any other dispute relating to environment and land. The jurisdiction of the court is provided under section 13 of the Act. The Court has original and appellate jurisdiction to hear and determine all disputes in accordance with Article 162(2) (b) of the Constitution and with the provisions of the Act or any other written law relating to environment and land. The court has powers to deal with disputes relating to land administration and management. The court is also empowered to hear cases relating to public, private and community land and contracts or other instruments granting any enforceable interests in land. The court also exercises appellate jurisdiction over the decisions of subordinate courts or local tribunals in respect of matters falling within the jurisdiction of the Court. The court further exercises supervisory jurisdiction over the subordinate courts, local tribunals, persons or authorities in accordance with Article 165(6) of the Constitution.

3.3.11 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.

3.3.12 Occupational Safety and Health Act 2007

The Occupational Safety and Health Act 2007applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of the act is to secure the safety, health and welfare of persons at work and protect persons other than persons at work against risks to safety and health arising out of, or regarding, the activities of persons at work. 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. It is ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD

79 | P a g e

thus recommended that all Sections of the Act related to this project, such as provision of protective clothing, clean water, and insurance cover are observed to protect all from work related to injuries or other health hazards. The project shall be registered as a work place for regular inspections from DOSH inspectors. A healthy and safety committee shall be established to undertake implementation of all the provisions of the law.

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

The Public Health Act (Chapter 242) is an Act of Parliament that provides for securing and maintaining good health of citizens. The Act contains directives that are focused on ensuring protection of human health. There are provisions within the Act that deal with water, air and noise quality as they pertain to human health. An environmental nuisance includes the emission from premises of waste waters, gases and smoke which could be regarded as injurious to health. The owner and/or occupier of premises responsible for such nuisances are liable to prosecution under the Act. The construction of the proposed road has potential pollution risks related to water and air. 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 various construction camps established all along the route

3.3.14 The Valuers Act (Cap 532), 1985

The revised edition 1985 of the Valuers Act Cap 532 makes provisions for the relevant charges and conducts of valuers in relation to valuation of assets. The Act also provides the relevant regulations and guidelines in the undertaking of the valuation works. The Act requires that adequate valuation is carried out to help meet the actual compensation measures and the market rates and reduce any acts of malice in the exercise. A competent valuer will have to be deployed to site to carry out the professional valuation of assets for compensation.

3.3.15 Physical Planning Act (Cap. 286)

This Physical Planning Act, Cap. 286 provides for the preparation and implementation of physical development plans. Section 36 of the Act 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 proponent and contractors of the proposed road will need to comply with the requirements of this Act

3.3.16 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 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.

3.3.17 The Employment Act, 2007

The Employment Act, 2007 defines the fundamental rights of employees including the basic conditions of employment of workers. It also regulates employment of children. The contractor on site will have to employ casual labourers probably from the communities where the road traverses during construction.

The basic conditions of employees should be observed to avoid unnecessary conflicts during the construction works. The Contractor shall pay the entire amount of the wages earned by or payable to the workers. Payment of such wages should be done at the end of a working day at or near the place of work. The Contractor shall also ensure that all statutory deductions are submitted without delay to appropriate government agencies e.g. Kenya Revenue Authority, NSSF, NHIF, among others.

3.3.18 Work Injury Compensation Benefit Act (WIBA) 2007

The Work Injury Compensation Benefit Act 2007 provides guideline for compensating employees on work-related injuries and diseases contacted during employment. The Act also requires provision of compulsory insurance for all employees. The Act defines an employee as any worker on contract of service with employer. 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.

3.3.19 Public Roads and Roads of Access Act Cap 399

The Public Roads and Roads of Access Act Cap.399 Act states that a public road is any road which the public has a right to use immediately before the commencement of this Act, or all proclaimed or reserved roads and thoroughfares being or existing on any land sold or leased or otherwise held under the East Africa Land Regulations, 1897, the Crown Lands Ordinance,1902, or the Government Lands Act at any time before the commencement of this Act and all roads and thoroughfares hereafter reserved for public use. The construction of the proposed road will need to take note of the provisions of this Act.

3.3.20 The Traffic Act Cap 403

The Traffic Act reserves the use of the road corridor for road facilities only. Any vegetation grown to protect the road edges should not cause problems during maintenance. 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. The contractor's vehicles shall comply with all the traffic rules in Kenya.

3.3.21 Building Code 2009

This by-law recognizes the county governments as the leading planning agencies. It compels potential developers to submit development applications for the approval. The county governments are hence empowered to approve or disapprove any plans if they do or don't comply with the law, respectively. Any developer who intends to erect a building must give the respective local authority a notice of inspection before the erection of the structure. On completion of the structure, a notice of completion shall be issued by the local authority to facilitate final inspection and approval. No person therefore shall occupy a building whose certificate of completion has not been issued by the county government.

Section 214 of the by law requires that any public building where the floor is more than 20 feet above the ground level should be provided with firefighting equipment that may include one or more of the following; hydrants, hose reels and fire appliances, external conations portable fire appliances, water storage tanks, dry risers, sprinkler, drencher and water spray spring protector system.

Section 194 requires that where sewer exists, the occupants of the nearby premises shall apply to the local authority for a permit to connect to the sewer and all the waste water must be discharged to the sewers. Finally, section 196 provides that the county government may refuse to admit to sewer any trade waste or any other effluent unless it has been treated in an approved manner. In this regard, the county government may cause the occupier of the premise to construct an approved manhole connected to the pipe conveying such effluent. In the development of the project, the proponent will have to comply with the provisions of this Act by complying to the Building code provisions.

3.3.22 The Kenya Roads Act, 2007

This is an Act of Parliament that provided for the establishment of Kenya Road Agencies i.e. Kenya National Highway Authority (KeNHA), the Kenya Urban Roads Authority (KURA) and the Kenya Rural Roads Authority (KeRRA), and provided powers and functions of the authorities.

KeNHA is mandated to manage, develop, rehabilitate and maintain all national roads. Other function vested to this authority relevant to the proposed project are: controlling national roads and road reserves and access to roadside developments; implementing road policies in relation to national roads; ensuring adherence to the rules and guidelines on axle load control prescribed under the Traffic Act (Cap. 403) and under any regulations under this Act; ensuring that the quality of road works is in accordance with such standards; in collaboration with the Ministry responsible for Transport and the Police Department, overseeing the management of traffic and road safety on national roads; collecting and collating all such data related to the use of national roads as may be necessary for efficient forward planning under this Act; monitoring and evaluating the use of national roads; planning the development and maintenance of national roads and liaising and coordinating with other road authorities in planning and on operations in respect of roads.

3.3.23 The Kenya Roads Board Act, 1999

The Act was assented in January 2000. Establishing a board to oversee the road network in Kenya and thereby coordinate its development, rehabilitation and maintenance and to be the principal adviser to the Government on all matters related to Road Development.

The Standard Specifications for Road and Bridge construction has guidelines on environmental protection and mitigation. Standard **Specification** Clauses 116,117,125,135,137 specifically address protection of the environment, with regard to water, health, safety and accidents, water supply, maintenance of the engineers' staff houses, offices, laboratories, and attendance upon the engineer and his staff. The provisions of these standards and codes must not be contravened during project implementation. These provisions are largely supportive of EMCA, Cap 387 and forms part of the legal basis for environmental mitigation, avoidance, prevention, compensation, restoration enhancement.

3.3.24 HIV / AIDS Act, 2006

Section 3 of The Act indicated the purpose of the legislation including public awareness and rights to people living with HIV/AIDS. Public awareness shall be achieved through education, public campaigns even at workplaces. This Act's provisions then give the guidelines unto which the project shall follow in educating workers and staff and providing of incentives to combat HIV/AIDs.

3.3.25 Urban Areas and Cities Act No 13 of 2011

This is an Act of Parliament to give effect to Article 184 of the Constitution, to provide for the classification, governance and management of urban areas and cities and to provide for the criteria of establishing urban areas. The Act also provide for the principle of governance and participation of residents of towns and cities. Under the Act a town is an urban area with a population of at least ten thousand residents. Also, under the Act the management of a city and municipality is vested in the county governments. The County Governments may impose such fees, levies and charges for delivery of services by the municipality or the city

3.3.26 The National Gender and Equality Act, 2011

National Gender Equality Commission is a constitutional Commission established by an Act of Parliament in August 2011, as a successor commission to the Kenya National Human Rights and Equality Commission pursuant to Article 59 of the Constitution. 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.

3.3.27 The Sexual Offences Act, 2006 and its amendment 2012

Observing a standard work ethic is recommended to ensure persons from both genders are not subjected to sexual offences. Ample working environment should prevail in all work places in the project, to be enhanced through implementation of a Sexual Misconduct Policy.

3.3.28 Matrimonial Property Act (No. 48 of 2013)

Matrimonial property is property owned or obtained by either or both married spouses before or during their marriage. It is sometimes called 'matrimonial assets.' Matrimonial property includes the matrimonial home; the home that the couple lived in during their marriage. It also includes many other things, not just physical property like land or houses but also things like the contents of the home, furniture and appliances, vehicles that a couple owns while married, and sometimes other things as well. It may include work pensions that either spouse may have, and certain debts that the parties have.

The law that deals with matrimonial property in Kenya is called the *Matrimonial Property Act*. This act only applies to married couples, or couples who are in a Registered Domestic Partnership. This act does not apply to common law couples.

When a married couple separates, either person can apply to the court to divide property, pensions, or debts. These issues, though, are usually dealt with during a divorce. It is important to speak to a lawyer for advice before dividing property, pensions, or debts. Once a couple is divorced, these issues are usually finished. You usually can't re-open them in the future if you've made a mistake. Compensation during resettlement needs to follows the legal provisions.

3.3.29 Persons with Disability Act, Chapter 133

This act protects the rights of people with disabilities ensuring they are not marginalized and that they enjoy all the necessities of life without discrimination. The act guarantees that (1) No person shall deny a person with a disability access to opportunities for suitable employment. (2) 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. (3) 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.

3.3.30 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. Security measures are vital in this project following past terrorist experiences reported in the area; the contractor shall embark on a community policing program to be executed by a competent security firm. It is recommended that the government takes keen in providing adequate support to enhance the security of persons involved in this project and the

community at large, which will translate to provision of critical intelligence that will trigger a review of the existing security measures and tactics, among other advantages such as security expertise and artillery.

3.4 National institutional / Administrative framework for the proposed project

There are various national institutions that are important in road project matters related to environmental management in Kenya. These are described in the following sections.

3.4.1 The National Environment Management Authority

The National Environmental Management Authority (NEMA) exercises general supervision and, co-ordination of all matters relating to the environment. NEMA is also the principal instrument of the government in the implementation of all policies relating to the environment. The Authority reviews EIA project and study reports for the proposed projects, visits the project sites to verify information provided in the report and issues EIA licenses if it considers that all the issues relevant to proposed projects have been identified and mitigation measures to manage them have been proposed.

3.4.2 The County and Sub-County Environment Committees

The County and Sub-County Environmental Committees contribute to decentralization of activities undertaken by NEMA. This has enabled local communities to have greater access to environmental management information. It has also enabled the County and Sub-County Environment Committees to conduct quick site visits and review of reports of proposed projects. Since the proposed project traverses through several Counties, the review of the report will be done at a National level for issuance of EIA license. However, it is also recommended that the EIA report should also be reviewed in each of the counties to create awareness and obtain ownership at county level. In fact, it is a practice and legal requirement that the review at County level be done before the ESIA Report is approved to NEMA.

3.4.3 Ministry of Transport, Infrastructure, Housing and Urban Development (MoTIHUD)

MoTIHUD is charged with the responsibility of providing basic infrastructure facilities to the public. These infrastructure facilities include development, rehabilitation and maintenance of the road network in the country. The Ministry will provide funding mechanisms and general guiding policies for this project.

3.4.4 The Kenya Roads Board

The Kenya Roads Board was established in 2000 through an Act of Parliament (The Kenya Roads Board, 1999, No. 7) and mandated to do these functions, among others, to: co-ordinate the implementation of all policies relating to the development, rehabilitation and maintenance of the road network; co-ordinate the development, rehabilitation and maintenance of the road network with a view to achieving efficiency, cost effectiveness and safety; administer the funds derived from the fuel levy and any other funds that may accrue to it; monitor the operations or activities undertaken by road agencies in the development, rehabilitation and maintenance of roads and evaluate, by means of technical, financial and performance audits, the delivery of works and many other.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 85 | P a g e

3.4.5 Kenya National Highways Authority (KeNHA)

The Kenya National Highways Authority (KeNHA) is a State Corporation established under the Kenya Roads Act, 2007 with the responsibility for management, development, rehabilitation and maintenance of national roads of class A, B and C. The proposed road will be managed by KeNHA since it's classified as Class A.

KeNHA has an established Environmental and Social Management Department to facilitate compliance of road projects with the requirements of environmental laws and regulations. This office advises KeNHA projects on various compliance issues. The office also has established linkages with NEMA. Projects contracts should be reviewed by this office directly or through the environment supervisor. Regarding the implementation of the social and economic aspects of the ESMP, it is proposed that the Resident Engineer works closely with the Environmental and Social Manager of KeNHA to ensure compliance to national policies and guidelines.

3.4.6 Directorate of Occupational Safety and Health Services (DOSHS)

The Directorate of Occupational Safety and Health Services (DOSHS) is one of departments within the Ministry of Labour and East African Community Affairs, whose primary objective is to ensure safety, health and welfare of all workers in all workplaces. Unsafe and unhealthy work environment causes accidents, diseases, disasters and environmental pollution that occasion huge economic and social burdens to individuals and enterprises thereby stifling economic and social growth. DOSHS will provide OSH permits for workplaces of the project including campsites and quarries.

3.4.7 Kenya Wildlife Service (KWS)

KWS is a state corporation that was established with the mandate to conserve and manage wildlife in Kenya, and to enforce related laws and regulations. It undertakes conservation and management of wildlife resources across all protected and unprotected areas systems in collaboration with stakeholders. KWS will guide and monitor road construction through animal migratory routes.

3.4.8 Water Resources Authority (WRA)

Water Resources Authority (WRA) is a state corporation established under Section 11 of the Water Act, 2016. Pursuant to Section 6 of the Act, the Authority is an Agent of the National Government responsible for regulating the management and use of water resources. The Water Act, 2016 makes extensive provisions on the Authority's role in regulating the use and management of water resources. WRA was operationalized on 21st of April, 2017 vide Gazette Notice No. 59. However, the Authority has been in existence for 12 years following its establishment under the Water Act, 2002 as Water Resources Management Authority (WRMA). WRA will provide the necessary borehole and water extraction permits from local streams.

3.4.9 Kenya Forest Service (KFS)

KFS is a corporate body established under the Forest Conservation and Management Act of 2016. The Act which was operationalized on 31st March 2017, gave the Service's mandate as ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD

86 | P a g e

"to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socioeconomic development of the country and for connected purposes". The revegetation of areas cleared for the project and material sites will be guided by regional KFS officers, especially in terms of the best tree species.

3.4.10 The National Museums of Kenya (NMK)

Is a state corporation established by an Act of Parliament, the National Museums and Heritage Act, 2006 no. 6 of 2006. NMK is a multi-disciplinary institution whose role is to collect, preserve, study, document and present Kenya's past and present cultural and natural heritage. This is for the purposes of enhancing knowledge, appreciation, respect and sustainable utilization of these resources for the benefit of Kenya and the world, for now and posterity. NMK will provide guidelines in case any discoveries or existing cultural and natural heritage resources within the project area.

3.4.11 National Land Commission (NCL)

NLC manages public land on behalf of the national and county governments, initiates investigations into present or historical land injustices and recommend appropriate redress, and monitor and have oversight responsibilities over land use planning throughout the country. It will undertake a key role in delivering land acquired through compulsory acquisition for the project.

3.5 International conventions and guidelines

There are number Multi-Lateral Environmental Agreements (MEAs) that are relevant to the proposed project. These are described in the following section.

3.5.1 Vienna Convention on the Protection of the Ozone Layer

This was an Intergovernmental negotiation for an international agreement to phase out ozone depleting substances concluded in March 1985 which saw the adoption of the Vienna Convention for the Protection of the Ozone Layer. This Convention encourages intergovernmental cooperation on research, systematic observation of the ozone layer, monitoring of CFC production, and the exchange of information.

3.5.2 United Nations Convention on Biological Diversity (UNCBD)

The purpose of this convention is to ensure the conservation and sustainable use of biodiversity. Kenya signed the convention on 5th June 1992 and ratified the same on 26th July 1992. The National Environment Management Authority (NEMA) is the National Focal Point to this Convention. The provisions of this Convention have been integrated in many laws of Kenya.

3.5.3 African Convention on the Conservation of Nature and Natural Resources

This convention reaffirms the importance of natural resources both renewable and non-renewable, particularly the soil, water, flora and fauna. The main objective is to facilitate sustainable use of the above resources. The convention was adopted in Algiers on 15th September 1968 and came into force on 16th June 1969.

3.5.4 Convention on International Trade in Endangered Species

This Convention was adopted on 3rd March 1973 and came into force on 1st July 1975. The purpose of the Convention is to regulate the international trade in wild plants and animals that are at risk of extinction because of trade. The Convention seeks to control trade not only in live species but also in dead specimen and their derivatives. The Kenya Government ratified CITES on 13th December 1978. The lead agency for the CITES in Kenya is the Kenya Wildlife Service (KWS).

3.5.5 The World Commission on Environment and Development (The Brundtland Commission of 1987)

The Commission in its 1987 report dubbed "Our Common Future" focused on the environmental aspects of development, the emphasis on sustainable development that produces no lasting damage to the biosphere and to ecosystems. In addition to environmental sustainability is economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resources. While social sustainable development is development that maintains the cohesion of a society and its ability to help its members work together to achieve common goals, while at the same time meeting individual needs for health and wellbeing, adequate nutrition, and shelter, cultural expression and political involvement. The key aspect of sustainability is the interdependence of generations.

3.5.6 The Ramsar Convention for the conservation and sustainable utilization of wetlands

The Ramsar Convention (formally known as the Convention on Wetlands of International Importance, especially as Waterfowl Habitat) is an international treaty for the conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value. Appropriate mitigation measures will need to be implemented as detailed in the Environmental Management Plan.

3.5.7 United Nations Convention to Combat Desertification (UNCCD)

The above Convention was adopted on 17th June 1994 in Paris and came into force on 26th December 1996. Kenya ratified the Convention in 24th June 1997. The purpose of the UNCCD is to address the problem of the degradation of land by desertification and the impact of drought particularly in arid and dry semi-humid areas. NEMA is the focal point for the Convention.

3.5.8 The 1992 United Nations Framework Convention on Climate Change (UNFCCC)

The primary purpose of the convention is to establish methods to minimize global warming and the emission of the greenhouse gases. The UNFCCC was adopted on 9th May 1992 and came into force on 21st March 1994. The Convention has been ratified by 189 states. Kenya ratified the Convention on 30th August1994. NEMA is the focal point for the Convention.

3.5.9 The Paris Agreement

This agreement was adopted on 12th December 2015 at the 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in Paris; it then came into force on 4th November 2016 after meeting the ratification threshold. The Agreement provides the framework to address climate change for a safer and sustainable future; it has an objective of preventing a global temperature increase above 1.5 degrees Celsius relative to pre-industrial levels by reduction of Greenhouse gas emissions. Kenya ratified the Paris Agreement and welcomed it into force on 28th December 2016. As at now a total of 171 parties out of 197 have ratified the agreement.

3.5.10 Rio Declaration on Environment and Development

The Rio Declaration on Environment and Development, often shortened to Rio Declaration, was a short document produced at the 1992 United Nations "Conference on Environment and Development" (UNCED), informally known as the Earth Summit. The declaration aimed at establishing a new and equitable global partnership through the creation of new levels of cooperation among States, key sectors of societies and people, working towards international agreements which respect the interests of all and protect the integrity of the global environmental and developmental system, recognizing the integral and interdependent nature of the Earth, our home. The Rio Declaration consisted of 27 principles intended to guide countries in future sustainable development. It was signed by over 170 countries.

Principle 17 of the Rio Declaration provides key relevance to the proposed project; the principle denotes that environmental impact assessment as a national instrument shall be undertaken for proposed activities that are likely to have a significant impact on the environment and are subject to a decision of a competent national authority.

3.5.11 Earth Summit on Sustainable Development Agenda 21

Agenda 21 is a non-binding, voluntarily implemented action plan of the United Nations regarding sustainable development. It is a product of the Earth Summit (UN Conference on Environment and Development) held in Rio de Janeiro, Brazil, in 1992. It is also regarded as an action agenda for the UN, other multilateral organizations, and individual governments around the world that can be executed at local, national, and global levels. The "21" in Agenda 21 refers to the 21st Century. Agenda 21 Section I on Social and Economic Dimensions is directed toward combating poverty, especially in developing countries, changing consumption patterns, promoting health, achieving a more sustainable population, and sustainable settlement in decision making.

Section II on Conservation and Management of Resources for Development Includes atmospheric protection, combating deforestation, protecting fragile environments, conservation of biological diversity (biodiversity), control of pollution and the management of biotechnology, and radioactive wastes.

Section III focuses on strengthening the Role of Major Groups including the roles of children and youth, women, NGOs, local authorities, business and industry, and workers; and strengthening the role of indigenous peoples, their communities, and farmers. Kenya continues to implement Agenda 21 to support sustainable development through the

integration of environmental concerns into the national development policies, plans, and programmes. Also relevant is the implementation of Agenda 17. The proposed project would need to be consistent with the objectives of Agenda 21.

3.5.12 Convention on the Rights of the Child

The Convention on the Rights of the Child (CRC), 1989 is the most comprehensive compilation of international legal standards for the protection of the human rights of children. The CRC is also the most widely ratified international human rights treaty, ratified by all countries in the world, apart from two.

The Convention acknowledges children as individuals with rights and responsibilities according to their age and development (rather than the property of their parents or as victims), as well as members of a family and community. Underlying the Convention are four main principles: non-discrimination, the best interests of the child, the right to life, survival and development and the right to participation.

3.5.13 Convention on the Elimination of all forms of Discrimination against Women

The Convention on the Elimination of all forms of Discrimination against Women (CEDAW) places explicit obligations on states to protect women and girls from sexual exploitation and abuse. Universal Declaration of Human Rights (Article 7), the UN Charter (Articles 1, 13, 55, and 76) and the International Covenant on Civil and Political Rights (Article 24) reaffirm the freedoms and rights of all children, including internally displaced children.

3.5.14 International Labour Organization

The International Labour Organization (ILO) is built on the constitutional principle that universal and lasting peace can be established only if it is based upon social justice. The ILO has generated such hallmarks of industrial society as the eight-hour working day, maternity protection, child-labour laws, and a range of policies which promote workplace safety and peaceful industrial relations.

The ILO has four principal strategic objectives:

- To promote and realize standards, and fundamental principles and rights at work.
- To create greater opportunities for women and men to secure decent employment.
- To enhance the coverage and effectiveness of social protection for all.
- To strengthen tri-parties and social dialogue.

The key ILO Conventions applicable to the proposed road project include:

- Equal Remuneration Convention (1951) (No. 100) Calls for equal pay and benefits for men and women for work of equal value.
- Discrimination (Employment and Occupation) Convention (1958) (No. 111) Calls for a national policy to eliminate discrimination in access to employment, training, and working conditions, on grounds of race, colour, sex, religion, political opinion, national extraction or social origin, and to promote equality of opportunity and treatment.

- Minimum Age Convention (1973) (No. 138) Aims at the abolition of child labour, stipulating that the minimum age for admission to employment shall not be less than the age of completion of compulsory schooling.
- Worst Forms of Child Labour Convention (1999) (No. 182) Calls for immediate and
 effective measures to secure the prohibition and elimination of the worst forms of
 child labour which include slavery and similar practices, forced recruitment for use in
 armed conflict, use in prostitution and pornography, any illicit activity, as well as
 work which is likely to harm the health, safety, and morals of children.

3.5.15 Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) are a new, universal set of goals, targets and indicators that UN member states will be expected to use to frame their agendas and political policies over the next 15 years. The SDGs include 17 Sustainable Development Goals and 169 targets. The 17 sustainable development goals (SDGs) include

GOAL 1: No Poverty

GOAL 2: Zero Hunger

GOAL 3: Good Health and Well-being

GOAL 4: Quality Education

GOAL 5: Gender Equality

GOAL 6: Clean Water and Sanitation

GOAL 7: Affordable and Clean Energy

GOAL 8: Decent Work and Economic Growth

GOAL 9: Industry, Innovation and Infrastructure

GOAL 10: Reduced Inequality

GOAL 11: Sustainable Cities and Communities

GOAL 12: Responsible Consumption and Production

GOAL 13: Climate Action

GOAL 14: Life Below Water

GOAL 15: Life on Land

GOAL 16: Peace and Justice Strong Institutions

GOAL 17: Partnerships to achieve the Goal

The GOALs seek to build on the Millennium Development Goals that expired in 2015. Most notably SDGs are integrated, indivisible and balance the three dimensions of sustainable development: the economic, social and environmental. This road project is expected to cut-across the three dimensions of sustainable development hence making SDGs a key reference point. The SDGs are also linked to several Kenyan legal frameworks such as Water Act, Forestry Act, and EMCA Cap 387.

CHAPTER 4.0: BASELINE ENVIRONMENTAL AND SOCIO-ECONOMIC PARAMETERS

4.1 Introduction

This chapter examines the baseline environmental, socio-economic and cultural characteristics of the route through which the proposed reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard and associated spur roads will pass. The chapter provides information on the existing environmental conditions including sensitive areas that will be potentially impacted by the project. The objective is to document the status quo for establishing and assessing the impacts of the project in future. The proposed road and associated spur roads traverses three counties: Kisumu, Kericho and Nandi. However the largest section of the road is within Kisumu County with the road only touching on the borders of Nandi and Kericho County. The area is relatively settled with a myriad of land use practices with agriculture (large scale sugar cane farming and arable farming and subsistence animal rearing) being the most prominent land use type.

4.1.1 Administrative Setting

Kisumu County has seven Sub-Counties/ Constituencies namely: Kisumu East, Kisumu West, Kisumu Central, Muhoroni, Nyando, Seme and Nyakach. These are further divided into 35 wards. Nandi has 5 administrative Sub-Counties and 11 Divisions. Further, the county has a total of 99 locations and 299 sub-locations. Politically the county has six (6) constituencies; namely, Mosop, Chesumei, Aldai, Emgwen, Nandi Hills and Tinderet and 60 wards.

Kericho county is divided into 6 sub-counties, which are further sub-divided into 85 locations and 209 sub-locations. Politically the county has 6 constituencies namely Belgut, Soin/Sigowet, Kipkelion West, Kipkelion East, Ainamoi and Bureti.

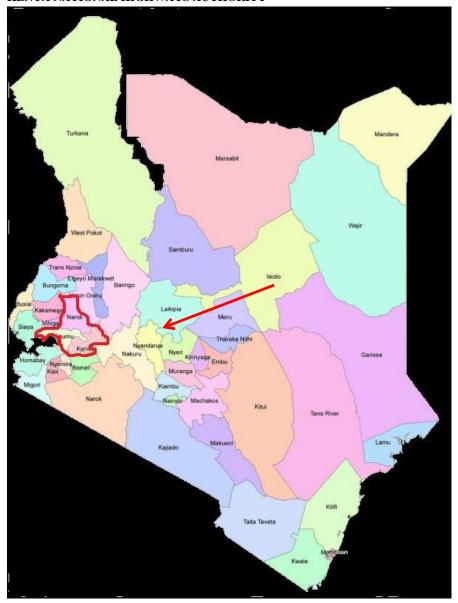


Figure 1.2: Showing the location of the three counties where the proposed road project is located (red arrow and red highlight)

The proposed road project traverses through Muhoroni Constituency, Nyando Constituency and Kisumu East Constituency in Kisumu County. It touches the border of Kipkelion West Constituency in Kericho County and the border of Nandi Hills Constituency in Nandi County

4.2 Project Biophysical Description

4.2.1 Position and Size:

Kisumu County lies between longitudes 33.020'E and 35.0 20'E and latitude 0⁰ 20' South and 0⁰ 50' South. The County is bordered by Homa Bay County to the South, Nandi County to the North East, Kericho County to the East, Vihiga County to the North West, Siaya County to the West and is surrounded by the second largest freshwater lake in the World, Lake Victoria. Kisumu County covers approximately 567 km² on water and 2086km² land area, representing 0.36% of the total land area of Kenya's 580,367km².

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 93 \mid P a g e

Nandi County is located in the North Rift region of Kenya. It lies between latitude 00.34N and longitude 34.045E to the West while the Eastern boundary reaches Longitude 35.025E. It covers an area of 2,884.4 Km²; and borders Kakamega County to the West, Uasin Gishu County to the North East, Kericho County to the South East, Kisumu County to the South and Vihiga County to the South West.

Kericho County lies between longitude 35.02° and 35. 40° East and between the equator and latitude 0.23 South with an altitude of about 2002m above the sea level. The county is bordered by the Uasin Gishu County to the North West, Baringo County to the North, Nandi County to the North-West, Nakuru County to the East and Bomet County to the South. It is bordered to the South West by Nyamira and Homa Bay Counties and to the West by Kisumu County. The county occupies a total area of 2,479 Km² and is divided into 6 sub-counties, 30 wards, 85 locations and 209 sub locations. The county is well positioned to benefit from various markets provided by the neighboring counties as it has robust national and county roads connecting to the rest of the counties.

4.2.2 Topographic features

Kisumu county

Kisumu county's topography is undulating and characterized by Kano-Plains which is a flat stretch lying on the floor of the Rift Valley, the Nyabondo Plateau and the over-hanging huge granite rocks at Riat hills, Maseno and Seme areas. Due to flash flooding, the Kano-Plains have rich alluvial soils which favour agricultural production in horticulture and rice. Granites on the other hand, find their use essentially in the building and road construction industry. The county is endowed with the second largest freshwater lake in the world; Lake Victoria with two major rivers namely Nyando and Sondu-Miriu and seven permanent rivers, Awach-Kano, Oroba/Ombeyi, Kibos, Awach-Seme, Kisian, and Mugru, in its catchment.

Nandi County

Nandi County comprises of five (5) distinct topographic features: the rolling hills to the West, the Kapsabet plateau, the Tinderet Volcanic mass, the King'wal Swamp and the Nyando escarpment on the Southern border. The Kapsabet plateau stands at 2,020m above the sea level; and comprises of an undulating land surface traversed by various rivers among which is rivers Kipkaren, Kimondi and Birei. The Tinderet highlands are an extension of the Kenya highlands and have in some places, rocks jutting out to height of 2,500m. Various rivers in the Tinderet highlands include Kipkurere, Kibos, Kundos and Ainabng'etuny which flow through forming deeply incised valleys. Some of these rivers produce substantial waterfalls and rapids that have potential for harnessing hydroelectric power. Lastly, the Nyando escarpment comprises of extremely rugged terrain that consists of granite and volcanic rocks. The Equator runs alongside the scarp-line.

Kericho county

Kericho county is characterized by undulating topography. The overall slope of the land is towards the West, consequently drainage is in that direction. The county forms a hilly shelf

between the Mau Escarpment and the lowlands of Kisumu County. To the North West are the hilly areas of Kipkelion rolling towards Koru. The Kericho plateau forms the central part of the county sloping gently from 2,500m to about 1,800m above the sea level.

The county is surrounded by Tinderet Hills to the North and to the North-East is the Mau Escarpment and between them is the gently rolling land which forms Londiani hills (*Tuluapsigis*). The central part of the county rises eastward towards 3,000m above sea level. The county is well drained with a good number of rivers that include Chemosit, Kiptaret, Kipsonoi, Timbilil, Maramara, Itare, Nyando, Kipchorian and Malaget. Some of these rivers are characterized by rapids and falls which could be harnessed for hydro-electric power generation. Some of the rivers with the waterfalls include Maramara, Itare and Kiptaret.

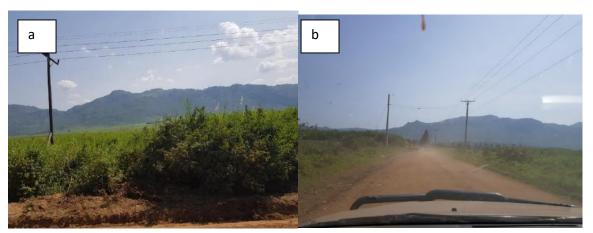


Plate 4.2: a and b Showing topography of the project area

4.2.3 Physical Features

Kisumu County

In Kisumu County, Kano Plains is predominantly black cotton soil which is poorly drained and unstable though suitable for rice, horticulture and sugarcane production. Seme and the lower parts of Nyakach Sub-counties are dominated by lake sediments, commonly sand and clay soils while Kisumu West Sub-county and upper-Nyakach are predominantly red-loamy soils suitable for agricultural production. The lake shores are generally swampy and offer fertile ground for horticulture and fish breeding.

Nandi County

In Nandi County, agricultural activity on depends on rainfall and altitude amongst other factors. 12 percent of the total land area comprises of forests. They include Tinderet, Serengonik, Nandi South and Nandi North forest which is an extension of the tropical Kakamega Forest. It is characterized by high rainfall and diverse species of trees.

The forests comprise of mixed indigenous hardwoods and exotic plantations at Kimondi and Serengonik forests measuring besides the 2,635.8 Ha. The total boundary length of forest in the county is about 363.8km. The medium potential areas are covered by shrubs and bushes

and are mainly found on the eastern plateau parts and portions lying below the scarp on the Nyando plains.

Kericho County

Kericho County lies in the Lake Victoria Basin. Its geology is characterized by volcanic rocks as well as igneous and metamorphic complexes. The county is predominantly underlain by tertiary lavas (phonolites) and intermediate igneous rocks. A small part of the county is dominated by undifferentiated basement system rock (granites), volcanic ash admixture and other prolific rocks.

The hilly nature in some parts of the county encourages soil erosion. This problem is however minimized by the presence of a dense vegetation cover, except in a few areas like Sigowet in Soin-Sigowet sub-county, Chilchila in Kipkelion west and partly the lower zones covering Koitaburot in Ainamoi sub-county



Plate 4.3: Showing the geology of the project area (soils and rocks at the stream bed)

4.2.4 Climatic Conditions

Kisumu County

The climate of Kisumu County is generally warm with minimal monthly variation in temperatures between 23°C and 33°C throughout the year. The rainfall is determined by a modified equatorial climate characterized by long rains (March to May) and short rains

(September to November). The average annual rainfall varies from 1000-1800mm during the long rains and 450-600mm during the short rains. The altitude in the County varies from 1,144 meters above the sea level on the plains to 1,525 meters above sea level in the Maseno and Lower Nyakach areas. This greatly influences temperatures and rainfall in the County.

January is entirely a dry month. The peak generally falls between March and May, with a secondary peak in September to November. Despite the challenges experienced in land preparation as black cotton soils are difficult to work on manually during dry and heavy rain seasons, the available rainfall is adequate and evenly distributed for small-scale food- crop production and cash-crop growing. The annual maximum temperature ranges between 25°C and 33°C and the annual minimum temperature ranges between 16°C and 18°C.

Nandi County

The Northern parts of Nandi County receive rainfall ranging from 1,300mm to 1,600mm per annum; while the Southern half which is affected by the Lake Basin atmospheric conditions receives rainfall as high as 2,000mm per annum. The County receives an average rainfall ranging from 1200mm to 2000mm per annum. The lowest rainfall is experienced in the Eastern and North eastern parts of the county, while the highest is recorded in the Kobujoi-Tindinyo area in Aldai Sub-County. Across Nandi, the highest rains are experienced in Kaptumo in Nandi South, Nandi Hills, Kapsabet and Kobujoi. The long rains start in early March and continue up to end of June; while the short rains start in mid-September and end in November. The dry spell is usually experienced from end of December to mid-March. The rainfall distribution and intensity has a direct bearing on the economic activities in the County. Those areas that receive 1500mm and above (LH1 and UM1), are under tea cultivation. The relatively drier areas to the East and Northeast, which receive an average rainfall of 1200mm per annum, mainly grow maize, sugarcane and coffee. The reliability of rainfall across the County implies that it has high potential for growing a wide range of

Most parts of Nandi County experience mean temperatures ranging between 18°C to 22°C during the rainy season; but the part adjacent to the Nyando escarpment at 1,300m above sea level), experiences average temperatures as high as 26°C. During the dry months of December and January, the temperatures are as high as 23°C; while in the cold spell, the night temperatures drop to as low as 14°C, in the months of July and August. The County in general has moderate to warm temperatures; with no cold and hot extremes throughout the year.

Kericho County

agricultural crops.

Kericho county enjoys favorable climate and receives relief rainfall, with moderate temperatures of 170C and low evaporation rates. Temperatures range between 10^{0} C - 29^{0} C. The rainfall pattern is such that the central part of the county, where tea is grown, receives the highest rainfall of about 2,125mm p.a while the lower parts of Soin and parts of Kipkelion receive the least amount of rainfall of 1,400 mm p.a.

The county experiences two rainy seasons: the long rainy season between April and June and the short rainy season between October and December. The dry season starts in January and progresses through March although weather shocks have changed the patterns. The variations in the temperatures and rainfall are mainly determined by the altitude of the place.

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4.2.5 Air Quality

The proposed road project is largely crossing over mainly rural areas and a few urban settlement where there is vehicular movement both small and goods transporting trucks including lorries, saloon cars, pickups motorcycles which emit a lot of smoke (carbon dioxide and carbon monoxide among other toxic gases) from the combustion of hydrocarbons in fuel and burning of wood in tea factories. The low level emissions are further moderated by filtration by the vegetation and high dispersal conditions. Pollutants including carbon dioxide, carbon monoxide, Sulphur oxides, nitrogen oxides and particulate matter (dust) may, therefore, be considered very low. However, during the dry seasons, dilapidated bitumen C674 road and the unpaved spur roads are very dusty. It is expected that during construction the fine dust will increase and there is need for water spray.

Potential sources of noise are the markets i.e. from traders and the buyers, vehicles mostly lorries transporting sugar cane and sand, tractors motorcycles, tractors, and some matatus. There are public utilities like schools, market centres where people are stationery for a prolonged time period and dust management is important.







Plate 4.4: Showing dust from a) tractor transporting sugar cane, b) smoke emissions from Kibos Sugar factory and c) motorists utilising the road

4.2.6 Water Resources Kisumu County

There are three major rivers flowing into the Winam Gulf namely: the Nyando, Kibos and Sondu. The rivers are heavily silted, resulting in the extensive formation of lakeside swamps. The project area has two river systems river Ruke/Menara, a seasonal tributary and River Nyando a permanent river.

Nandi County

Nandi County is blessed with 7 major rivers and myriad of permanent streams flowing throughout the year. They include Olare Onyonkie river, Kimondi-King'wal, Kabutie, Mokong, Yala, Kipchoria and Kundos Ainopngetuny river.

Kericho County

The main water sources are in the county include rivers, streams shallow wells and springs.

As large populace in the project area lack piped water supply relying on the rivers, streams and springs for their domestic consumption and chores.



ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 99 | P a g e

Plate 4.5: a) surface water source and community members doing laundry in one of the rivers

4.2.7 Solid and Liquid Wastes

a. Solid Waste

Wastes generated at various levels of the community are generally disposed off into thenatural environment. Most wastes generated include bio mass from crops especially from sugar cane farms and animal wastes, , plastic bottles, carrier bags, and urban wastes from shopping centers.

b. Liquid Waste

The project traverses a rural area where majority of the homesteads use pit latrines with a few homes, institutions such as high schools and hospitals having septic tanks.

4.2.8 Noise and Vibrations

Noise and vibration is also limited to commercial and residential noise that is generally below the established standards. Transport related noise is also insignificant; the noise is below levels tolerable by human as established under the guidelines (55dBA over a period of 8hrs by day and 45dBA by night) since there are no significant sources of noise.

4.2.9 Flora and Fauna

a. Flora

The project falls within an area that has transformed from a natural landscape to human dominated landscape consisting primarily of farmlands and urban, peri urban and rural settlements. Some of the major urban settlements along the traverse include Muhoroni and Chemilil among others.

A few remnants of natural and secondary planted vegetation exist which include napier grass (*Pennisetum* spp)., *Eucalyptus spp.*, *Mimosa spp*, *Albezia caraira*, *Lantana camara*, *Phragmites australis*, *Musa domestica* and *Tithornia diversiflora*. Other species present include *P. australis*, *Psidium guajava*, *Mimosa spp*. and *Tithornia diversiflora*, *Psidium guajava*, *Ficus spp.*, *Acacia spp.* and *Mimosa spp.*



ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 100 | P a g e



Plate 4.6: a) Vegetation along the project road, b) riverine vegetation and c) napier grass

b. Fauna

Fauna species along the road include rodents (rats and mice), numerous insects, several avian species such as weaver birds, storks, cranes, fish species in the river system mainly labeos, cat fish barbell and Tilapia-(Barbus altianalis Boulenger, Labeo victorianus Boulenger, Barbus cercops Whitehead, Clarias gariepinus Burchell, Barbus nyanzae Whitehead, Barbus kerstenii Peters, Barbus jacksonii Günther, Barbus appleurograma, Oreochromis leucostictus Trewavas, Gambusia affinis Baird & Girard, and Bagrus docmak Forsskål), mongooses, frogs, toads, monitor lizards, snakes (puff adders, house snakes, water snakes and cobras)

Domesticated animals are reared dairy cattle, beef cattle, pigs, goats, sheep, poultry, rabbits and bees.



Plate 4.7: Zebu cattle enroute to grazing along the project road

4.2.10 Land Resources

Kisumu County

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 101 \mid P a g e

Land is the most important natural resource in the county being a source of economic, social, political and cultural development through provision of natural resources that are vital for supporting livelihood and material wealth. However, approximately 50 percent of the county's land surface is grossly underutilized with sparse or no development especially in rural areas. In addition, most of the land in the county has not been registered which hinders people from asserting their rights over land. The mean land holding size in the county is 1.6 acres while the mean agricultural parcel is 1.0 acres. The population is predominantly rural with those living in rural areas depending entirely on land as the natural resource for subsistence and economic purposes. Due to population pressure, the small parcels of land continue to be subdivided into uneconomical sizes. The main crops grown are food crop (maize, beans, rice, sorghum, green grams, sweet potatoes, cassava, tomatoes, cowpeas, kales and groundnuts), sugarcane and rice.

Nandi County

The major land types in Nandi are forests, woodlots, wetlands, rivers, open grasslands with vegetation, the Nandi escarpment, valleys and hills, tea plantations and the Kapsabet plateau. The project road has essentially a rural disposition with the local population mainly engaged in dairy and cash/subsistence farming. Land resources in the project area of importance to the project included soil/gravel and rocks. Soil/gravel and rocks are important for the project as it will be used for formation of the Subbase for the road while the rivers will be a critical source of water for construction.

Land in Nandi County is owned by two categories namely; freehold and lease. Freehold tenure applies to customary land which is usually put under agricultural use. Minimum Land holding size within the county depends on the use. Large scale farming especially of tea holds large chunks of land (sometimes as low as 100 acres to above 1000 acres). Small and medium scale farmers own approximately 2 acres-50 acres which are mostly used for agriculture; subsistence and commercial. Rampant subdivision of agricultural land abutting built up areas has been experienced due to urbanization process.

The main food crops produced in the region are maize, beans, Finger millet, Sorghum, Sweet potatoes and cassava which cover a total of 105, 087 Ha. The main cash crops are tea, coffee and sugar cane

Kericho County

There are two major land tenure systems in Kericho County namely the Leasehold Tenure and the Freehold Tenure. The Freehold Tenure is governed under the Land Registration Act of 2012 and is mainly utilized for farming. On the other hand, Leasehold Land Tenure system is an interest in land for a definite term of years usually 99 years renewable upon request by the proprietor. The average land holding size in the county is 0.9 ha. for the smallholders and 14 ha. for large scale holders. The large-scale holders are mostly the multinationals which utilize the land for tea and flower farming. Small scale farms are under food crop and livestock production.

The main crops produced in the region are maize, beans, Finger millet, Sorghum, Sweet potatoes tea, pineapples, coffee, sugarcane, potatoes, maize and horticultural crops.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY C34) ROAD 102 | P a g e

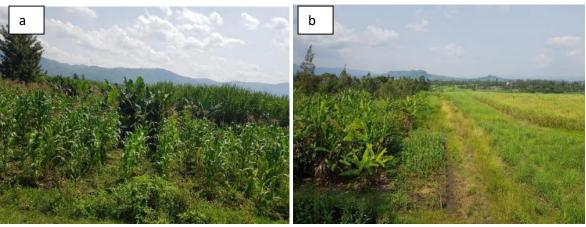


Plate 4.8: Farmland with maize, bananas and sugarcanes

4.3 SOCIAL-ECONOMIC BASELINE SURVEY

4.3.1 .Demographics

Kisumu County

According to 2019 National Census Kisumu County has a population of 1,155,574. The population density is 550 persons per Km². The population distribution by sex is 556,942 male and 594,609 female, intersex 23 (2019 Kenya Population and housing census.

Nandi County

Nandi County is home to over 752,965 people (50% male and 50% female), according to the 2009 National Census.

Kericho County

Kericho county has a total population of 901,777 of which 450,741 are males, 451,008 females and 28 intersex persons. There are 206,036 household with an average household size of 4.4 persons per household and a population density 370 people per square kilometre

4.3.2. Trade

The county has micro, small and medium size business enterprises. There are numerous registered business entities spread across different sectors in the three counties with the two major types being: Service Business: A service type of business provides intangible products. Service type firms offer professional skills, expertise, advice, and other similar products. They include salons, repair shops, schools, banks, accounting firms, and law firms, and Merchandising Business: There are several merchandizers in the county. They include supermarkets, grocery stores, convenience stores, distributors, and retailer.

4.3.3 Employment

There are several categories of employment in the county. The first instance is those people working in multinational companies such as sugar factories, mining, tea factories and flower farms get their dues in terms of wages. This is because most of the employees of these firms are employed under contract terms. Roads and building construction is another source though it is seasonal employment. The category of the self-employed which entails people working on their own farms. These are the people who spend most of their time engaged in tilling, harvesting and rearing livestock for their livelihood. This type of employment contributes to more than 50 percent of employment in the three counties. Other kinds of self-employment comprise of people undertaking their own businesses either in the main trading centres or in the rural settings which range from small kiosks, car wash, bodabodas, sand harvesting, to wholesale trading.





Plate 4. 9: Different forms of economoic activities a)matatus, b) market stalls, c) car wash, d) bodabodas, e and f)sand harvesting,

4.3.4 Education

Kisumu County

Primary and secondary education is provided by 706 primary schools and 173 public secondary schools. The enrolment in primary school and secondary school stood at 240, 538 and 38, 815 as of 2009. The teacher to pupil ratio was 1:51 for primary and 1:30 for secondary. Kisumu Polytechnic provides several technical courses for young adults and also professionals, including some diploma courses. 5 youth polytechnics also exist in various parts of the county. The county has several colleges and universities such as , Nairobi University, Maseno University , Great Lakes University and several teaching and nursing colleges.

Nandi County

Nandi County has about 744 primary schools and 155 secondary schools with about 220,000 pupils and 27,000 students respectively. The county is home to some of Kenya's best schools, including Kapsabet High School, Kemeloi Boys' Secondary, Kapsabet Girls High School, Meteitei Boys Secondary School, Samoei High School, and St. Josephs Girls, Chepterit, Cheptil Secondary School among others. Several institutions of higher learning are found here among them the University of Eastern Africa, Baraton (UEAB), Koitalel Samoei University (a constituent college of the University of Nairobi) Mosoriot Teachers College, Mosoriot and Kaptumo Medical Training Colleges and Kaiboi Technical Training Institute among other

Kericho County

There are 1054 ECD centres 803 primary schools and 229 secondary schools. The county has also 1 teachers training colleges, 6 Youth Polytechnics, 80 adult training institutions and 6 technical training institution.



Plate 4. 10: Sample education institution along the project road

Kisumu County

Kisumu County has three State-owned Sugar Milling Factories; Chemelil, Muhoroni and Miwani which unfortunately are riddled with heavy debt burden, mismanagement and obsolete machineries and one privately-owned; Kibos. There is an Agro-chemicals food processing plant in Muhoroni and East African Breweries has a plant in the county providing an opportunity to Sorghum farmers to invest in sorghum production to sustain the demand for the industry. However key textile industries such as KICOMI have since remained dormant despite the favorable agro-ecological conditions for quality cotton production. The fate is similar for the fish processing industry which has remained dormant despite the existence of the second largest fresh water lake in the world; L. Victoria

Huge potential also exists in horticulture production and processing, given agro-ecological conditions, however this remains unexploited. The County hosts Kisumu bottlers which processes, bottles, sales and distributes Coca cola products in the entire Western region. There is also numerous water bottling factories spread across the County, and several commercial quarries such as in Koru where limestone is mined.

Nandi and Kericho County

The industries in Nandi and Kericho County have a similarity due to the same agro ecological systems. There are major tea factories, a number of cottage industries in the timber lumbering, coffee, milk, honey value addition and other agro processing cottage enterprises. There are coffee factories several milk cooling plants, various collection points for sugar factories and textile apparel units.



Plate 4.11: Showing Kibos Sugar factory

CHAPTER 5.0: STAKEHOLDER ENGAGEMENT AND PUBLIC PARTICIPATION

5.1 Introduction

This chapter describes the process of public consultation and participation that were followed to identify the key issues and impacts of the proposed project. Stakeholder Engagement and Public Participation Process is an integral aspect of successful decision making in the ESIA processes for major developments. Public participation is a key requirement as stipulated in Article 69 Section 1 of the Kenyan Constitution, 2010, Legal Notice 101 of the Environmental Management and Coordination Act (EMCA), Cap 387 Section 58, for achieving the fundamental principles of sustainable development in ESIA, Section 3 of the EIA/EA regulations, 2003 and Section 87 & 113 of the County Governments Act, 2012.

It is an important process through which stakeholders including beneficiaries and members of public living in project areas (both public and private), are given an opportunity to contribute to the overall project design by making recommendations and raising concerns projects before they are implemented. In addition, the process creates a sense of responsibility, commitment and local ownership for smooth implementation.

5.2 Objectives for consultation and public participation

The general objectives of the consultation and public participation were to:

- 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.

5.3 Public participation

Public Consultations were organized through: the Governor's Offices (Kisumu, Nandi and Kericho), County Commissioners offices (Kisumu, Nandi and Kericho), MPs, chief's offices and the Business Community The invitations covered the broad spectrum of community members likely to be affected by the project within the roads corridor of influence.

Three meetings were held involving top county leadership from the National Government and the County Government arms. The meeting focused on the top leadership level due to the Ministry of Health guidelines on the management of Covid-19 that restricted public gatherings.

The first meeting was held on 4th June 2020 at the Kericho County Commissioners office, the Second meeting was held on 4th June at the Nandi County, Governor's Board room and the third meeting was held on 5th June 2020 at Kisumu Sunset Hotel.

In addition a set of questionnaires was utilized to gather information from members of the public due to the observance of the Ministry of Health guidelines on the management of Covid-19.

The completion of the questionnaires allowed for the synthesis and analysis of issues that arose which provided basis upon which the environmental, economic and social aspects of the ESIA was undertaken.

From the administered questionnaires a number of concerns were noted pertaining to the current state of the road key among them being the dilapidated road results in increased cost of repair of vehicles and bodabodas, increased cost of doing business due to high cost of transportation and fares to commuters, inaccessibility to health centres, increased insecurity due to lack of business opportunities as a result of limited access, some sections of the road and feeder roads are impassible during the rainy season which even because a threat to school going children. During construction the community raised a number of issue that they noted could occur which included: frequent accident from project vehicles, bodabodas and other road users due to lack of signages and maintenance of diversions, dust pollution, disruption of business especially for road side traders, delay in travel time if there is no planning of road works and diversion, and slow progress and delay in works due lack of proper planning and capacity of the contractors involved. To mitigate against the impacts it wa highlighted that there is need to properly maintain the diversions from watering and grading, install speed humps especially near centres and schools, offer employment to the locals, installation of signages, payment for disrupted and construction of market stalls.

Generally it was noted that once the road was completed it improve the living standards of the area project area as numerous business will spring up, cost of transportation and repair for motor vehicles and bodabodas would reduce, access to health facilities will be enhanced, enhanced mobility and enhanced security due to ease of doing patrols for the police.

A summary of the positive, negative impacts and mitigation measures are as per shown in the table below:

POSITIVE	NEGATIVE	MITIGATION OF
		NEGATIVE IMPACTS
■ Ease of movement	 Disruption of traffic 	Proper and timely
Opening up rural	Dust emission	consultation with the
areas	Increase in accidents	community during
■ Improvement of	from bikes, trailers,	construction
security	and project vehicles	Considering all black
Economic	Disruption of	spot during design
improvement	business	■ Offering of
Revamping of the	•	employment for the
sugar factories-		community
Miwani, Kibos and		■ Dust suppression
Muhoroni Sugar		during construction
factories and hence		Project should consider
an improvement in		providing offering
the standards of		opportunity for local to
living		supply locally available
		materials

KENYA NATIONAL HIGHWAYS AUTHORITY	OCTOBER 2020
	■ Provision of bumps to
	control speed
	 Training of road users
	on road safety
	■ Install zebra crossing
	especially near schools
	■ Provision of market
	stalls

CHAPTER 6: ANALYSIS OF PROJECT ALTERNATIVES

6.1 Introduction

This section analyses the project alternatives in terms of site, transport alternatives, materials and technology scale, solid waste and wastewater management options and shall involve studying design alternatives and analyzing them based the environmental costs and benefits this shall involve studying the technology, design, capital investments, operation and maintenance requirements among others

6.2 No-Construct/No Project Alternative

The 'No Project Alternative': assumes that the implementation of the project does not go ahead, implying a continuation of the current situation leaving the socio-economic prospects of the area dormant and inhibition of free flow of traffic within project area and the periphery. This is not a preferred option by either the road users, communities bordering the project road or the country in general since it has economic, social and environmental implications.

Under the No action alternative, no improvements will be undertaken; the resultant socioeconomic benefits of the developments would be foregone. The anticipated environmental and social impacts resulting from construction and operation of the development would not occur.

6.3 Alternative mode of transportation

There are no viable alternatives to this road that fulfill the functions of providing relatively fast, cheap land transportation. Air, rail, and water transport are unlikely to either complement or to substitute for roads or highways in the project area leaving the road as the most important link between the counties traversed by the proposed roads. The proposed project road is an existing bitumen road which over time has become dilapidated and its reconstruction and rehabilitation will not involve any major horizontal or vertical realignment

6.4 Analysis of Alternative Route/Realignment

Due to the fact that the current road earmarked for reconstruction and rehabilitation is an existing classified road and only tarmacking is required to improve its standards, there are no other alternative routes which could be constructed economically.

6.5 Upgrading of the road

Since road transport is the major form of transport in the region, upgrading the road to bitumen standards will enhance movement of goods and people. The project is on an existing alignment implying lower construction costs and lower environmental and social impacts compared to developing a new alignment. The proposed reconstruction and rehabilitation of the road could the following potential implications:

• Increased traffic that will impact on the towns, public institution, schools and residential dwellings

- The improvement will affect environmental features i.e. biological and physical features.
- Possible displacement/ relocation of people and demolition of structures; especially business premises and institutions incase additional space is required for construction

Reconstruction of the road will enhance traffic flow, save travel time, reduce travel cost thus improve accessibility, enhance mobility and improve welfares. This is perhaps the most preferred option

6.5 Alternative Road Building Technologies

a. Concrete Paving

Concrete is typically only used for local roads in urban areas. Concrete is more long lasting than asphalt and significantly stronger as well, but is quite expensive to lay and maintain.

b. Asphalt Paving

Asphalt paving is one of the most common type of construction technique. Advantages of this form of road construction are that the pavement produces relatively little noise, its relative low cost compared to other materials, and that is relatively easy to repair and maintain as well. However, asphalt is significantly less durable. This is perhaps the most preferred option for this project considering the location and cost implications.

CHAPTER 7.0 GRIEVANCE REDRESS MECHANISM

7.1 Background

This section describes the Project's Grievance Redress Mechanism. The overall objective of the GRM is to establish an effective communication channel among the stakeholders for providing a timely and efficient two-way feedback mechanism to address any grievances and complaints against the project from multiple stakeholders and Project Affected. This GRM complies with the Law of Kenya and international best practices.. During the proposed reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard. and associated spur roads , grievances, complaints as well as disputes are expected to arise during project implementation.

7.2 Objectives of the GRM

The project implementation team will work to prevent grievances through the implementation of proposed mitigation measures as per the ESMP and as identified through the Grievance Redress Mechanism (GRM). Specific objectives of the GRM are:

- To provide community and stakeholders in general with a clear process for providing comment and raising grievances;
- To provide a platform for stakeholders to raise comments and concerns;
- To structure and manage the handling of comments, responses and grievances, and allow monitoring of effectiveness of the mechanism; and
- To ensure that comments, responses and grievances are handled in a fair and transparent manner in line with KENHA internal policies and World Bank's Operational Policies and requirements.

Examples of Possible Grievances and Complaints

Examples of grievances expected during the project include:

- Community and stakeholder complaints against environmental, health, safety and social impacts of the project. These may include inadequate dust suppression, noise from construction activities and equipment, accidents and near misses on the carriage way from traffic in active construction areas or project vehicles etc.;
- Complaints from persons to be compensated or resettled. These may include complaints about compensation amounts, payment processes, delays in relocation after compensation;
- Community complaints on benefit sharing (or lack thereof) from the project. Project related activities where this may arise include use of construction materials sourced from the project area, employment opportunities for local community members, CSR activities by the project (if any);
- Labour related complaints from both the consultant and contractor staff;
- Complaints arising from community-project staff relations.

7.3 Proposed Procedure

For avoidance of doubt, the Chief Grievance Handling Officer will be the Resident Officer. Everybody else will acts on RE's behalf and reports to him/her.

Anyone will be able to submit a grievance to the project, if they believe any practice by the project is having a detrimental impact on the community, the environment, or on their quality of life. They may also submit comments and suggestions on how such issues can be handled or prevented.

Stakeholder sensitization on the GRM will be undertaken during community and stakeholder meetings scheduled under the project's SEP. Instruments for grievance redress mechanism, complaint registration form and grievance resolution form are attached in **Appendix 3 and Appendix 4** respectively. The steps taken for receiving and handling grievances is as follows:

Step 1: Submitting a Complaint

A complaint can be submitted to the Contractor's Social and Environment Officer (SEO) the Consultant's Social Safeguard Expert or the Community Liaison Officer (CLO) in the following ways:

- During regular public meetings held with the communities;
- Through Consultative Forums with stakeholders;
- During any informal meetings;
- Through communication directly with management for example a letter addressed to site management, or other operational offices;
- By telephone including use of text messages / short message service (SMS) from cell phones;
- Placing a comment in the community suggestion boxes at the site office; and
- By registering a complaint in the Grievance Log Form at the contractor or consultant's office.

Regardless of the form of submission, the contractor's or consultant's SS Expert/Community Liaison Officer will be responsible for ensuring that all complaints are logged in a **Grievance Form.** Where necessary, the specific Social Safeguard Expert will arrange for a meeting with the concerned parties so as to document the grievance.

All grievances reported to the Consultant will be filed in a dedicated **file stored in the RE's Office**.

The Consultant's Social Safeguard Experts will also track resolution of grievances filed with the Contractor through regular inspection of the Contractor's Grievance File and Grievance Log.

The summary of all complaints (from both the Contractor and Consultant's Grievance File) must also be logged in the **Grievance Register** upon logging for tracking of the resolution process.

The Register will also be stored in the RE's Office.

All resolutions will be communicated to the affected parties in writing and a copy of the **signed acceptance / rejection of the ruling** by the complainant stored in the Grievance File.

Step 2a: Assess and Assign

On receiving the complaint, the Contractor's Social Safeguard Expert/Community Liaison Officer will carry out the following steps;

- Verify and establish the communication channels of the grievances by identify mode of communication to be used to communicate feedback and responses.
- ii. Contact the concerned aggrieved and complainant parties and initiated communication on way forward to commence investigation.
- iii. Determine the mode and different ways of commencing assessment process.
- iv. Ensure confidentiality is upheld in most levels of assessment process.
- v. Carry out assessment process by identify and reaching out key parties involved in grievances.
- vi. Cross examine by triangulating issues raised and determine the key factors wanting redress.
- vii. Assign key informants to specific task during assessment process ensure credibility of information is up to required standard.
- viii. Ensure documentation of all data and information is secured and protected.
- ix. Ensure each party commit to their words by signing the documents and assessment materials for authentication process.
- x. With each party, carry out validation process of information to ensure acceptance and commitment of each party in assessment process.

Step 2b: Providing the Response / Acknowledgement

For general grievances, a resolution must be communicated to the complainant within 5 working days of logging of the grievance. However, grievances will first be categorized for resolution based on validity and priority level by the SS Expert with full knowledge of the RE, as below:

- High-Resolved / Actioned within 2 working days;
- Medium-resolved / Actioned within 4 working days;
- Low-Resolved / Actioned within 5 working days.

Prioritization will be based on the risks as determined by the environmental and social safeguards for the project as defined in the ESMP, the project license, Kenyan legal and regulatory framework pertaining to Environment, Health and Safety

Where no immediate corrective action¹ is possible, the complainant will be notified in writing within two working days of logging of the grievance on what the next steps are.

Step 2c: Investigating the Grievance

If the grievance has to be investigated, then the SS Expert will aim to complete investigation within one week after the grievance first log-in. Depending on the nature of the grievance, the approach and personnel involved in the investigation will vary.

With the full involvement of the RE, the SS Expert will then co-ordinate the constitution of the investigative team and the participants of the grievance hearing. The Investigation Report will at a minimum outline the approach taken, the participants, evidence collected and recommendations of the investigations.

A hearing will then be held within two working days of the submission of the investigation report and a resolution given.

Step 3: For Unresolved Grievances

If resolution is not met, it will be escalated to relevant external parties such as the officers of the Deputy County Commissioner on the ground, or any other relevant authority. However, in such a case, KeNHA will be notified prior to involvement of these external parties for a no-objection.

In accordance with the laws of Kenya, parties have the right to go to the court system including the Land and Environment Court. This will be the next option if all else fails.

However, the main principle of this mechanism is to deal with complaints as soon as is practicable, expeditiously and in a transparent manner so as to avoid complainants deferring to the justice System.

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7.4 Management of Grievances under the project RAP

The grievance mechanism for the resettlement process was developed during the ESIA and RAP Studies. The key aspects of the mechanisms are presented below:

Table 2: Proposed grievance framework

Proposed Grievance Framework

Grievances related to any aspect of the proposed reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil- will be handled through negotiations, which will be aimed at achieving consensus following the proposed procedures outlined below:

- 1. Grievances will be filed by the person affected by the project with the Local Grievance Committee, who in consultation with the relevant Local Compensation Committee and the consultant's representative (in all likelihood, the socioeconomic survey valuer), will act within 15 days after receipt of the grievance.
- 2. If no understanding or amicable solution can be reached, or if the affected person does not receive a response from the Local Grievance Committee within 15 days after receipt of the grievance, s/he can appeal to the Commissioner of Lands through the auspices of the local Ministry of Lands officer who is to act on the grievance within 15 days of its filing.
- 3. If the affected person is not satisfied with the decision of the Commissioner of Lands (or his delegate), s/he, as a last resort, may submit the complaint to a court of law.

All grievances received in writing (or written when received verbally) will be documented.

CHAPTER 8.0 ANALYSIS OF ENVIRONMENTAL IMPACTS

8.1 Definition and classification of impacts

An impact in this context refers to any change that is likely to cause change in the environmental or socio – economic setting. The impacts can be either negative or positive. The impacts may also be direct or indirect, localized dispersed or cumulative if they add to the already existing impacts. They may also occur immediately or may be delayed in their timing. Another description used is if the impacts are permanent in their persistence or temporary. The impacts are also described using the phase that they occur in i.e. planning, operation or construction.

The baseline biophysical and social environmental parameters established in Chapter 4 are critically examined in this section in relation to the potential environmental and socioeconomic impacts of the proposed road upgrading project. In addition to adhering to the mitigations below, the contractor needs to comply with the requisite national legislation and regulations that are outlined in Chapter 3 of this report.

This Chapter identifies the potential environmental and social impacts of the proposed project, based on the components of the explained data collection methods and procedures mentioned in Chapter 1 sub chapter 1.5, in the context of the baseline conditions that have been established in Chapter 4, and with due regard to applicable legislation described in Chapter 3. The predicted impacts are then assessed using the Leopold matrix as explained below.

8.2 The Leopold matrix

The Leopold matrix is a grid that is used to identify the interaction between project activities, which are displayed along one axis, and environmental characteristics, which are displayed along the other axis. For the identification of impacts, a breakdown of the environment into elements or factors that may be affected and a breakdown of the various actions or activities of the project under study will be done.

8.3 Impact identification and evaluation

The Leopold matrix is an effective method of predicting impacts quantitatively. Quantification means using numbers to indicate the impact. It is helpful in presenting information in summary form to give readers an overview of the impact characteristics of the Project and the alternatives to it.

Once the list of impacts or changes on the different elements of the medium has been established they are characterized using the following features and criteria:

- Sign (Nature)
- Type
- Intensity.
- Extension.
- Time.
- Reversibility

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONIKIPSITET C6744 (FORMERLY C34) ROAD 118 | P a g e

- Recoverability
- Persistence.

8.4 Description of the terms used

6.4 Description of the terms used	
Sign /Nature of the impact	Alludes to the beneficial nature (+), bad (-)
Intensity	It refers to the degree of impact on the factor, in the specific area in which it operates. Ranked from 1 to 3. The three expressed as an almost total destruction of the factor in the area in which the effect occurs
Type	Refers to the nature of the impact, direct (3) indirect (2) or cumulative (1)
Extension/Location	An area of influence covered by the impact in relation to the project environment. In this sense, if the action produces a much localized effect within the space, it is considered that the impact is low (1). If, however, the effect does not support a precise location within the project environment, having a pervasive influence beyond the project footprint, the impact will be large (3). Intermediate situations are considered as partial (2).
Timing	Refers to the moment of occurrence, the time lag between the onset of action and effect on the appearance of the corresponding factor. We consider three categories according to this time period is zero, up to 2 years, or more than two years, which are called respectively as immediately (3), medium term (2), and long term (1).
Reversibility	It refers to the possibility of reconstructing the initial conditions once the effect. Can be characterized as short-term (1), medium term (2) and impossible (3).
Recoverability	It refers to the possibility of providing or not the corrective measures to avoid or minimize impact. For impacts with positive sign will not express their recoverability
Duration/ Persistence	Refers to the time that supposedly stays the effect, from the onset of the action in question. Two situations are considered, depending on whether the action produces a temporary effect (1) or permanent (3). It is therefore this generic characterization because spaces are not discrete time course associated with these categories and

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONIKIPSITET C6744 (FORMERLY C34) ROAD 119 \mid P a g e

because in any case, it is very difficult, in the
limit, to discern on temporary or permanent
effects.

A logical and systematic approach was taken for impact identification. The aim was to take into account all the important environmental/project impacts and interactions, making sure that indirect and cumulative effects, which may be potentially significant, are not inadvertently omitted. Individual environmental issue were also viewed in respect to the different facets of the project.

The rating evaluation will be as follows:

Table 3: Key of the Rating Parameters

EVALUATION	RATING	RATING
PARAMETER		
Nature of impact (NI)	-Positive	+
	-Negative	-
	-Uncertain	-/+
Type of impact (TI)	-Direct	3
	-Indirect	2
	-Cumulative	1
Extent(EXT)	-Disperse	3
	-Medium	2
	-Localized	1
Intensity (IT)	-Major	3
	-Medium	2
	-Minor	1
Reversibility (R)	-Short term, easily	1
	reversible	2
	-Long term, partially	3
	reversible	
	-Not reversible	
Timing (TM)	-Immediate	3
	-Medium	2
	-Delayed, long term	1
Persistence (PI)	-Temporary effect	1
	-Permanent effect	3
Phase	-0	Operational period
	-C	Construction period

8.5 Impact magnitude Indicators

As pointed in *LEGAL NOTICE No. 101 THE ENVIRONMENTAL (IMPACT AND AUDIT) REGULATIONS, 2003 ARRANGEMENT OF REGULATIONS, SECOND SCHEDULE* the following issues may, among others, be considered in the making of environmental impact assessments.

- Impacts on the Physical Environment
- Impact on the Biological Environment
- Impact on socio-economic environment

The Magnitude or Importance impact represents the entity or significance of the effect, includes the degree of incidence and the "form" of that effect, represented by other attributes. Its value is clear from taking the attributes described by the following formula.

$$Imp = Sign (3Iij + 2Eij + Tmij + Pij + Rij),$$

Where:

Imp: Importance or magnitude of the impact generated by the action on the project I j element of the medium

Ii: Intensity of the impact generated by the action on the project I j element of the medium.

Ei: Extent of the impact generated by the action on the project I j element of the medium.

Tmi: Timing, the moment of impact generated by the action on the project I j element of the medium.

Pi: persistence of effect, from the onset of the action in question.

Ri: Possibility of reversibility.

In this study only two impact characterization parameters included in the matrix are not considered in the impact magnitude valuation formula, these are the "type" and "recoverability" (WB methodology, 1995).

Table 4: Environmental Impact Matrix

Topic	Element	Action	Impacts	TI	EX	IT	R	TM	PI	Phase	MG
	Ground cover	Project foot print	Extent of vegetation clearance required	3	1	2	2	3	1	C/O	14
Vegetation		Clearance to create space	Loss of mature indigenous/ medicinal species	2	1	1	2	3	1	C/O	11
vegetation	Plant species	Clearance to meet increased energy requirement	Accelerated degradation of vegetation	2	1	2	2	2	3	C/O	15
	Soil physical properties	Civil and general works	Loss of top soil hence alterations of soil profile	2	1	1	2	1	1	C/O	9
Soil Resources	Soil contamination	Civil and general works	Activities likely to lead to soil pollution	2	1	2	2	1	1	С	12
	Soil Erosion	Civil and general works	Exposure to erosion agents	3	2	2	1	2	1	C/O	14
	Water Quality	Civil and general works	Contamination of surface water	2	3	1	2	1	1	С	13
	Water Quality	Civil and general works	Contamination of ground water sources	2	3	2	2	1	1	C/O	16
Water Resources	Water Quantity	Water channeling	Increased surface runoff and resulting soil erosion from channeled water	2	1	2	1	2	1	C/O	12
	Water Quantity	Water abstraction for construction	Alteration of water supply as a result of abstraction	2	3	1	1	1	1	С	12
Air Quality	Air pollution	Civil and general works	Dust and/or smoke generation during works	3	1	2	1	3	1	С	13
	Air pollution	Traffic during	Increased CO2 emission from	1	1	1	2	1	3	О	11

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELIL-MUHORONIKIPSITET C6744 (FORMERLY C34) ROAD 122 | P a g e

KENYA NATIONAL HIGHWAYS AUTHORITY

OCTOBER 2020

		operation	use of fossil fuel								
Aesthetics	Impact on the landscape	Civil and general works	Change of visual of visual impacts (features, vegetation removal)	2	1	2	1	3	1	С	13
Noise and Vibrations	Excessive vibration above ambient	Civil and general works and operation	Consider machine type and extent of vibration during construction	3	1	2	1	3	1	C/O	13
Waste	Solid waste	waste generation and handling	Ingestion by livestock and wildlife	1	3	2	2	2	1	C/O	17
management		ana nanating	Reduction in aesthetics	2	2	2	1	3	1	C/O	15
Invasive weed	Invasive weed species	Civil and general works	Activities likely to aid in proliferation of the weed	2	3	2	2	1	1	С	16
Topography	Material sites	Civil and general works and project footprint	Extent of vegetation clearance associated with quarries	3	1	2	1	3	1	С	13
Occupational safety and health	Disease, accidents and injuries	Civil and general works	Accidents, injury and exposure to diseases for the workers and road users	3	1	2	2	2	1	C/O	13
Social	Works across trading centres	Civil and general works	Impacts on trade and movement	2	1	2	1	1	1	С	11
disruptions	Resettlement	Civil and general works	Family disruptions and relocation of business premises	2	3	1	2	1	2	C/O	14

The impacts have been rated in the table 3 above. The impact rating quantitative figures range from 10-12. These have been categorized into

High 18 and above

Medium 17 - 15

Low to insignificant 14 and below

Rating	Element	Action	Impacts				
	Solid waste	waste generation and handling	Ingestion by livestock and wildlife				
	Water Quality	Civil and general works	Contamination of ground water sources				
	Invasive weed species	Civil and general works	Activities likely to aid in proliferation of the weed				
	Vegetation	Clearance to meet increased energy requirement	Accelerated degradation of vegetation				
	Solid waste	waste generation and handling	Reduction in aesthetics				
	Ground cover	Project foot print	Extent of vegetation clearance required				
IUM	Soil Erosion	Civil and general works	Exposure to erosion agents				
MEDIUM	Resettlement	Civil and general works	Family disruptions and relocation of business premises				
	Water Quality	Civil and general works	Contamination of downstream surface water				
	Air pollution	Civil and general works	Dust and/or smoke generation during works				
	Impact on the landscape	Civil and general works	Change of visual of visual impacts (features, vegetation removal)				
	Excessive vibration above ambient	Civil and general works and operation	Consider machine type and extent of vibration during construction				
	Material sites	Civil and general works and project footprint	Extent of vegetation clearance associated with quarries				
ТОМ	Disease, accidents and injuries	Civil and general works	Accidents, injury and exposure to diseases for the workers and road users				

Soil contamination	Civil and general works	Activities likely to lead to soil pollution
Water Quantity	Water channeling	Increased surface runoff and resulting soil erosion from channeled water
Water Quantity	Water abstraction for construction	Alteration of water supply as a result of abstraction
	Clearance to create space	Loss of mature indigenous/ medicinal species
Air pollution	Traffic during operation	Increased CO ² emission from use of fossil fuel
Works across trading centres	Civil and general works	Impacts on trade and movement
Soil Physical properties	Civil and general works	Loss of top soil hence alterations of soil profile

8.6 Potential environmental and social impacts

8.6.1 Potential Construction Phase Positive Impacts

The project route will serve as a much needed transport artery to foster the economic development by serving as a link from areas with high economic potential. It will revitalize the economy, social status and the agricultural sector along the counties the roads will traverse.

The projects are expected to have the following positive impacts:

- Provide an alternative link road thus providing access to Kisumu, Kakamega, Nandi Hills, Kapsabet and Eldoret.
- Ensure timely and efficient transportation of agricultural produce and industrial products to markets.
- Creation of employment opportunities;
- Improved local socio-economy; ease of road transport in the area;
- Improved local investment;
- Improved living standards; e
- Enhanced peace and improved security;
- Improved education;
- Improved national transport;
- Improved road safety;
- Empowerment of women;
- Improved drainage; Improved access to services, and reversal of rural urban migration though creation of new economic opportunities in the area.

8.6.3 Negative Impacts and Mitigation Measures

8.6.3.1 Physical and Topographic Features

Impacts

- Destabilization of terrain stability during earthwork and excavations along the traverse
- Alteration of baseline landforms during excavations and earthworks
- Accelerated erosion after earthworks
- Development of pits during material sourcing (quarries and borrow pits)

Mitigation Measures

- Slope gradient maintenance and controlled borrow pits and quarry excavation to avoid vertical faces and slopes and possible scree or mudflows during heavy rains
- Erosion control measures in excavated borrow pits areas and working sites along the road
- Site reclamation or rehabilitation after exhaustion of borrow sites, quarries and during decommissioning phase of the project.

Residual Impacts: (Magnitude, Geographic Extent, Duration, Significance, Reversibility)

- During the construction phase the noted impacts will have a medium magnitude, with a localized geographical extent. Their duration will be short-term during earth works and not reversible. The impacts will have localized major significance.
- During decommissioning stage, noted impacts, earthwork related impacts will be reversed through rehabilitation process, which will include slopes protection, rehabilitation of material sites and borrow pits.

Recommendations

Adherence to the ESMP during construction

8.6.3.2 Air Pollution

Impacts

During construction, the excavations, demolitions, and transportation of cut materials and fill materials will result in the emissions of large amounts of dust within the project site and surrounding areas. Asphalt, concrete and batching plants are also possible sources of dust and air pollution within the project area. The diversion of traffic during construction works will also contribute to dust emissions.

Mitigation Measures

- Sprinkling of water on dry and dusty surfaces regularly including the access roads and diversion tracks utilized during construction
- Add suitable soil stabilizers such as crushed aggregate stones on access roads or pave access roads to control dust.
- Erection of dust screens during construction especially at the workers' camps around public institutions and market centres. Dust control measures should be adopted at the concrete batching plants, providing adequate PPE to staffs, canopying loading points, erecting dust screens around the plant and covering

trucks ferrying roads works materials.

- Instituting wet crushing at the crusher to reduce fugitive dust emission
- The contractor is expected to conduct separate ESIAs for the batching plants and monitor the dust levels periodically
- Comply with personal protective clothing requirement for dusty areas such as dust masks/respirators, gloves, coveralls, hand tops, and protective glasses.
- Enforce onsite speed limit regulations for construction vehicles and those belonging to members of the public.
- Re-vegetating exposed areas during the operation phase of the project.
- Sprinkling water along the diversion routes or earth along the road section.
- Slowing the speed of traffic by using bumps to reduce dust levels from vehicles utilizing the road during construction.
- Haulage routes will need to be identified and maintained by watering to minimize the impact of dust.
- Adhere to the Environmental Management and Co-ordination (Air Quality) Regulations, 2014.

To mitigate exhaust emissions, it will be mandatory to:

- Procure machines, equipment and vehicles which are environmental friendly.
- Ensure machines and vehicles are properly and regularly maintained.
- Discourage plant operators and drivers of construction vehicles from unnecessary revving and idling.
- Limit construction traffic movement and operations to the most necessary activities through adequate planning.
- Sensitize construction drivers and machinery operators to switch off engines when not being used.
- Ensuring that the construction machines, equipment and vehicles have the requisite inspection certificate.
- Control the speed of the traffic movement by through adequate policing and monitoring.
- Adhere to the Environmental Management and Co-ordination, Fossil Fuel Emission Control Regulations 2006.

Residual Impacts (Nature of Impact, Geographic Scale, Significance)

Negligible; Temporary, Local, Minor. Only to be experienced within the construction sites, quarries and during material haulage.

Recommendations

Adherence to the ESMP during construction

8.6.3.3 Noise and Vibrations

Impacts

Because of excavation, construction and crushing works, there will be high noise and vibration levels in the project area. Noise and vibrations will emanate from transportation vehicles, construction machinery, metal grinding and cutting equipment, and among others. Blasting and excavation works will also cause vibration and noise. Quarries and borrow pits that will be used for sourcing of road construction material will also result to noise emissions..

Mitigation Measures

- 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 all the time to avoid excessive noise generation.
- Ensure that all workers wear ear muffs 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 Environment Management and Coordination, 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.
- The management should equally observe relevant explosives use and blasting permits provided by the Inspector of Mines and Geology.
- Blasting activities along the road corridor and associated quarries should adhere to the provisions of the blasting Act and the NEMA Environment Management and Coordination, Noise and Excessive Vibrations Pollution Control Regulations 2009.

Residual Impacts (Nature of Impact, Geographic Scale, Significance)

The nature of impact is negligible. The impacts geographical scale will mainly be localized to construction sites only and impacts significance will be negligible.

Recommendations

Adherence to the ESMP during construction

8.6.3.4 Waste Management

Impacts

Varied volumes of solid wastes will be produced during construction.. Solid waste materials will be generated during demolition works as well as from various packaging materials. The old dilapidated black top along the road is expected to produce asphalt waste. Significant quantities of rock and soil materials will be generated from excavation and other forms of earth movement during construction activities. Solid waste generation during operation and maintenance activities will include road resurfacing waste (e.g. removal of the old road surface material), road litter, illegally dumped waste, or general solid waste from won centres, markets, vegetation waste from the clearance of road reserves; and sediment and sludge from storm-water drainage system. Paint waste may also be generated from road and bridge maintenance (e.g. due to removal of old paint from road stripping and bridges prior to re-painting).

In addition domestic based effluents from the camp sites, kitchen office, concrete batching (cement washouts) if not well handled can lead to discharge into the environment leading to ground and water pollution and exposing the community to water borne diseases

Mitigation Measures

- Maximizing the rate of recycling of road resurfacing waste either in the aggregate (e.g. reclaimed asphalt pavement or reclaimed concrete material) or as a base;
- Provision of bottle and can trash disposal receptacles at camp, offices and parking lots during operation to avoid littering along the road.
- Obsolete products should be managed as a hazardous waste as described in the Waste Management Regulations, 2006.
- 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.
- Grinding of removed, old road surface material and re-use in paving, or stockpiling
 the reclaim for road bed or other uses). Old, removed asphalt may contain tar and
 polycyclic aromatic hydrocarbons and may require management as a hazardous
 waste.
- Develop and implement a Construction Waste Management Plan before start of the project.
- Sub-contract a NEMA licensed waste handling firm to collect solid wastes on regular basis and dispose off in approved dumping sites.
- Drainage outfalls should be properly constructed to be able to self-clean and reduce instances of blockages.
- Establishment of functional domestic waste handling facilities such as septic systems, grease traps and separation of grey and black water systems.
- Frequent exhaustion of the septic systems to prevent instances of overflow

- Ensure regular maintenance of plumbing system and septic tanks to avoid spillage of raw sewage.
- Compiling with provisions of the Environmental Management and Co-ordination, Waste Management Regulations 2006.

Residual Impacts

The residual impacts are as follows:

- The impact of excavation waste is expected to be slight, negative and for short-term.
- The impact of construction waste is expected to be imperceptible.
- The impact of operational waste is expected to be imperceptible.

Recommendations

Adherence to the ESMP during construction

8.6.3.5 Material Sites sourcing and Material Haulage

Impacts

The impacts anticipated from materials extractions and haulage include the following;

- Potential elevated noise emanating from materials extraction activities and delivery trucks to the immediate residents.
- Vibrations from the material extraction machinery which have a potential to cause cracking of structures
- Over-abstraction of water for construction from public sources of water could compromise on availability of the same for basic social needs.
- Emission of dust and gaseous discharges from material abstraction machinery will create potential aesthetic pollution, air pollution and risks to health.
- Removal of vegetation cover and top soils affects the land soil quality.
- Borrow pits left open have potential health and safety risks to the local communities, children and their animals.
- Sources of sand mainly within and outside the project area have potential risks to damage the river beds.

Mitigation Measures

- Environmental impact assessments (EIA) to be undertaken prior to extraction of materials from identified sites and approved by NEMA and Water resources Authority.
- Operations of the materials sites to be guided by respective management plans established and approved under the ESIA,
- Material extractions and delivery should only be done during the day.
- If borrow pits and quarries are operated, they be fenced off.
- Proper handling and management of liquid effluent and used waste oil to forestall incidence of surface water bodies
- Any abstraction of water from the existing river systems or from boreholes

- should be undertaken after acquisition of the prerequisite licenses,
- Rehabilitation of materials sites to take place upon exhaustion (Contractors will provide appropriate rehabilitation plans for each material site).
- If commercial material sources are adopted, the Contractor(s) should ensure due diligence process is followed by the suppliers at all times,
- Material extraction and haulage should be done in dump conditions to keep dust low, especially if it is located within settled areas.

Residual Impacts (*Nature of Impact, Geographic Scale, Significance*)

- During the construction phase the noted impacts will have a medium magnitude, with a localized geographical extent. Their duration will be short-term during earth works and not reversible. The impacts will have localized major significance.
- During decommissioning stage, noted impacts, earthwork related impacts will be reversed through rehabilitation process, which will include slopes protection, rehabilitation of material sites and borrow pits.

Recommendations

Adherence to the Construction ESMP

8.6.3.6

8.6.3.6 Occupational Health and Safety Impacts

Impacts

The Occupational safety and health issues associated with the construction and operation of the proposed road will include; physical hazards, chemical hazards and noise hazards. Chemical hazards in road construction, operations, and maintenance activities will principally be associated with exposures to road construction materials such as cement, kerosene, hot bitumen, , dust during construction; exhaust emissions from heavy equipment and motor vehicles during all construction activities, movement . Road construction and maintenance personnel can be exposed to a variety of physical hazards from operating machinery and moving vehicles but also working at elevation on bridges and overpasses. Other physical hazards include 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. There is also a possibility of accidents when transporting workers to the construction sites and social ills.

Mitigation Measures

- Develop and enforce a fleet management plan for road construction that includes measures to ensure work zone safety for construction workers and the travelling public.
- Establishment of work zones to separate pedestrians and livestock travelling by foot from vehicular traffic and equipment by routing of traffic to alternative roads where possible.
- Regular issuance of appropriate PPEs and regular trainings on proper use and maintenance of PPEs
- Conduct basic Occupational Health Training programs to construction workers during construction phase.
- Ensure workers are oriented to the specific hazards of individual work assignment.
- Conduct toolbox talks focusing on relevant health and safety issues.
- HIV/AIDS, STDs awareness, training and prevention services to be offered throughout the project period.
- A Code of Conduct should be distributed to all workers, and health personnel should reinforce their efforts to combat diseases during the construction period.
- Workers to be sensitized on the consequences of social ills and promiscuous behaviors (over consumption of alcohol, STDs, HIV /AIDS etc).
- Contractor to establish mobile clinic within the construction sites
- Use protective barriers to shield the public from vehicular traffic, regulation of traffic flow by warning lights, design of the work space to eliminate or decrease blind spots, and ensure reduction of 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.
- Issuance of permits to work when undertaking hazardous tasks
- 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 work space (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. Working under personnel on elevated structures should be avoided.
- 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;
- Ventilation of indoor areas where vehicles or engines are operated or use of exhaust extractor hose attachments to divert exhaust outside.

Residual Impacts (Nature of Impact, Geographic Scale, Significance)

- During construction phase: Negligible; Temporary, Local, Minor. Only to be experienced within the construction sites, quarries and during material haulage.
- During operational phase: Negligible nature of impacts which will be temporary, localized and of minor significance.

Recommendations

Adherence to the Construction ESMP

8.6.3.7 Loss of Biodiversity

Impacts

Potential impacts to biodiversity could arise due to the physical disturbance during the construction, contamination of the environment due to chemical/oil spillage or leakage and inappropriate liquid and solid waste disposal mechanisms. Removal of vegetation and topsoil during the construction and also creation of deviations and other ancillary facilities will lead to impacts such as a loss of wildlife habitat, reduction in plant diversity, potential for increased erosion, and potential for the introduction of invasive flora species. Indirect impacts to vegetation would include increased deposition of dust, spread of invasive and noxious species, aquatic pollution, water quality deterioration, and the increased potential for

wildfires. Dust settling on vegetation may alter or limit plants' abilities to photosynthesize and/or reproduce. These processes may lead to the reduction in habitat, food and nutrient supplies and breeding areas.

Mitigation Measures

- Separate EIAs should be conducted for camps, borrow pits, quarries, boreholes (if any) and other ancillary facilities.
- Minimize clearing and disruption of riparian vegetation.
- Provide adequate protection against scour and erosion; and consider the onset of the rainy season with respect to construction schedules.
- Minimize clearing of indigenous plant species and replanting of indigenous plant species in disturbed areas.
- Explore opportunities for habitat enhancement through reduced clearance to conserve or restoration native species.
- Employ vegetation rehabilitation techniques to recover lost plant cover such as Reforestation and Afforestation.
- The contractor is expected to comply with the National Sand Harvesting Guidelines provided by NEMA and the County Governments
- Undertake an inventory/ Review existing information on species and habitats in the project area. Contact appropriate agencies early in the planning process to identify potentially sensitive ecological resources that may be present in the project area.
- Conduct pre-disturbance surveys in order to locate site facilities away from important ecological resources (e.g., wetlands, important upland habitats, sensitive species populations).
- Ensure activities don't pose minimal impacts to riverine flora and fauna.
- Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance.

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Residual Impacts: (Value/Sensitivity, Magnitude of Impact, Significance)

- Impacts of High Sensitivity value:
- Their magnitude is minor
- Their significance is adverse

Recommendations

Compliance with recommendations in the Construction ESMP

8.6.3.8 Impacts on surface water quality

Impacts

There will be an increase in the generation of wastewater and sewage during the construction phase of the project. The increases will take place at the construction camp sites and in various towns located along the road. This is attributed to increased activities in these towns. Possible impact on water will be as a result of oil spillage, disposal of used lubricants, fuel and oil filters during the construction. Possible impacts include: pollution of groundwater sources during construction phase interference with existing community water sources during construction phase, infiltration of contaminants from on-site activities into soils, pollution and degradation of water quality of underlying aquifer during earthwork, excavations, oil wastes from the camp/garage and impact to human health through direct exposure to contaminated drinking contaminated.

Mitigation Measures

- Drainage structures that will be constructed –cross culverts, at the river courses be at appropriate positions.
- Stone pitching and side drains to cover meaningful lengths along the prone protection areas.
- Timing of the construction of proposed bridges to coincide with dry periods when water levels in the rivers are low to avoid possible water pollution.
- Contractor to avoid dumping of waste materials within the riparian zones/ within the watercourses.
- Bitumen trucks should be washed at designated areas only.

Residual Impacts (*Nature of Impact, Geographic Scale, Significance*)

- During construction the noted impacts have low significance since they are site based and localized to construction sites only. They have minimal significance due to their limited site specific geographical scale.
- During operational, the listed impacts will have low magnitude of impacts along the 63 road project and associated 54km of spur roads (extent).

Recommendations

Adherence to the construction ESMP

8.6.3.9 Land Resources

Impacts

The construction of the proposed road project requires substantial quantities of materials that will be sourced from either existing or new borrow pits and quarries. This will impact areas where such materials will be obtained from and hence a recommendation that those sites should undertake site specific EIAs before authorization of extraction activities. The extraction and transportation of these materials will also result in the distortion of the ground structure, vegetation loss, dust emission, oil spills, noise and increase potential for accidents. Such sites if artisanal in nature may pose safety issues to

the public due to possible falls. Further, the quarries and borrow pits resulting with extraction of raw materials may collect water which will form ponds especially during rainy seasons. Such stagnant water is highly suitable breeding grounds for mosquitoes and other diseases vectors thereby bringing about water borne diseases such as malaria, cholera, and typhoid. Other impacts will include: loss of and productivity potential; permanent loss of natural (material) resources; and increased susceptibility to soil erosion.

Mitigation Measures

- The materials should be sourced from borrow sites and quarries after ESIA/ EIAs and rehabilitation plans are prepared and approved by NEMA;
- There should be adequate re-use of the excavated waste materials;
- Blasting should take place at designated times and the affected public within approximately 5km radius duly informed;
- Where compensation and relocation are required, land value should be determined by independent surveyor/ valuer or other component body such as the Ministry of Lands;
- The explosives should not be kept on the sites; instead they should be delivered
 to the site as and when necessary from special storehouses managed by the
 contractor;
- There should be adequate landscaping, backfilling and draining of the depressed areas to prevent breeding grounds for disease vectors, this should be ascertained by KeNHA or NEMA County Directors;
- The borrow pits and quarries should be located more than 500 metres from the watercourses and in a position that should facilitate the prevention of storm water run-off to prevent run off from the site entering the water course
- Adequate notice should be given in advance to the nearby communities of the intention to excavate the borrow pits and quarries.

Residual Impacts: (Value/Sensitivity, Magnitude of Impact, Significance)

The noted impacts have high significance in relation to respective site specific land use. The impacts have minimal significance due to their limited site specific geographical scale.

Recommendations

Adherence and compliance to the Construction ESMP

8.6.3.10 Increased rate of soil erosion

Impacts

Construction of the road will involve creation of a large impervious surface that restricts the infiltration of rainwater. This will lead to high generation of surface runoff that flows on the sides of the road in drainage ditches. Where the surface runoff is channeled directly to bare steep slopes with loose soil, it can lead to serious soil erosion problems. This can undermine the stability of the road including associated facilities such as bridges. Sediment and erosion from construction activities and storm water runoff may

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Mitigation Measures

- Cut and fill areas: Road design activities should aim at balancing and fill
 activities to reduce the net quantities of soil either for disposal or borrowing. All
 cut, and fill sites will be replanted with sod grass to complete cover while the
 edge of the road reserve will be marked with a row of locally adapted tree
 species.
- Project will avoid opening new materials borrow sites: In as much as possible, hard rock will be sourced from existing quarries. However, there may be need to open up new quarries in some areas. Such opening will be followed by rehabilitation of the quarry site prior to closure of the contract. An Environmental Management and social Plan is expected to be developed and cleared for each of the material site opened under the project.
- Rehabilitation of borrow areas: During quarrying and other works involving removal of top soil, each layer not required should be stockpiled separately for re-use to reinstate quarries and other material sources after exhaustion. Towards mitigation of craters left behind after material extraction, all land acquired for material extraction will be backfilled and re-instated. Where the top soil does not fill the pit, water draining tunnels will be constructed to prevent /minimize stagnation of water..
- The contractor will source materials such as gravel, sand, ballast and hard core at the project locality. Consultation should be held with the community members and their representatives on the best sites to source materials and rehabilitation measures should be agreed..
- It is recommended that environmental impact monitoring should be conducted for such activities or in consultation with respective County Directors of Environment to ensure environmental conservation and rehabilitation after use. The contractor should ensure application of acceptable environmental performance standards and that the negative impacts of their activities at the extraction sites are considerably well mitigated.
- To reduce the negative impacts on availability and to ensure sustainability of the
 materials, the contractor should only extract what will be required through
 accurate budgeting and estimation of actual construction requirements. This shall
 ensure that materials are not extracted or purchased in excessive quantities.
 Moreover, the contractor will ensure that wastage, damage or loss (through runoff, wind, etc.) of materials at the construction site is minimal, as these would

lead to additional demand for and extraction or purchase of the materials.

- In addition to the above measures, the contractor should consider reuse of excavated materials and use of recycled materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing impacts at the extraction sites.
- All exhausted quarries and borrow pits should be isolated, protected and rehabilitated to usable state before the contract closure.

Residual Impact (Magnitude, Geographic Extent, Duration, Significance, Reversibility)

• During Construction phase the impacts' magnitude will be low and localized within the construction sites only. Impacts duration will be intermittent and short term over rainy weeks/months during the construction. Their significance will be minor and not reversible in case they occur.

Recommendations

Adherence and compliance to the Construction ESMP

8.6.3.11 Soil contamination

Impacts:

The analysis of the potential project impact discussed in this section is related to the possibility that during the implementation of the proposed road project activities, poor waste management, and oil/fuel and chemical leaks will contaminate the soil, thus affecting its quality.

Pollution of soil may result from discharge of fuel, chemicals and construction material spillage onto soil. Biodegradable and non-biodegradable wastes will be generated during the construction phase. These will include stones, sand, steel (metallic bars), insulators and other construction materials. Plastic wastes such as mineral water bottles, polythene bags, jerry cans, and other plastic accessories may also be generated at the camps and in the fields. Organic wastes such as foodstuff and human waste will also be generated at the camps and work centres. Accidental spillages of oil and grease from the garage, workshops, asphalt plant, fuelling station, crusher site, fuel off-loading sections and construction machineries may also result in soil contamination.

These wastes, if not well managed, have the potential to contaminate the surrounding soil and alter both its chemical and physical properties thus affecting its productivity. The impact is only envisaged during construction phase.

Mitigation Measures

- The Contractor shall ensure that all wastes generated during construction activities such as conductors, steel and metallic bars, insulators and other accessories are collected and disposed of appropriately at designated sites;
- All plastic waste generated (at campsites and in the course of undertaking works) such as mineral water bottles, polythene bags, jerry cans, will be collected

preferably in mobile vans and handed over to a licensed waste collector or re used;

- Soil and gravel should be shaped and compacted immediately after transport to its destination. Spoil from the earthworks should be dumped in a central place and covered
- Maintain spill kits at the contractor's garage, workshops and those areas experiencing spillages.
- Storage of oil and tar drums should be done on concrete floors to prevent exposure of soil to contamination
- Construction activities should be carried out during the warm seasons. This will
 aid in compaction of the surface material and reduce the loss of soil and gravel
 by storm water runoff
- Re-vegetation of excavated areas to ensure ground stability.
- Scour checks and stone pitching should be done on steep sections of the road to minimize erosion
- The waste management hierarchy will be followed during the construction phase. According to this hierarchy, source reduction of waste will be the first option and disposal of unavoidable waste as option of the last resort;
- Undertake routine preventive maintenance of motorised equipment to avoid any fuel leakage and spills;
- Storage of fuels and oils should be undertaken in a manner that does not allow leakage to the soil as the fuel can readily infiltrate the soils polluting the soils, ground and surface water; and Collect and dispose of all waste generated from project activities in accordance with EMCA (Waste Management) Regulations 2006 and international best practice

Residual Impact (Magnitude, Geographic Extent, Duration, Significance, Reversibility) The impacts' magnitude will be low and localized within the construction sites only. Impacts duration will be intermittent and short term over weeks/months within the construction sites only. Their significance will be minor and not reversible in case they occur.

Recommendations

Adherence and compliance to the construction ESMP

8.6.3.12 Social Impacts

Impacts

During the implementation of project activities, the local social service sector will be

overwhelmed by the presence of project employees who may be in need of these services. If the project leads to in-migration, it will increase pressure on social service infrastructure like housing, health, water sources and sanitation facilities in the area when people move into the community in anticipation of employment opportunities. With an increase in the population of the area boosted by the project employees the social set up of the area will be affected. This change may be in the form of lost social norms and morality, an increase in school drop-out due to cheap labor, child labor, and increased incidences of HIV/AIDS and other communicable diseases.

Mitigation Measures

• The contractor should develop and implement labour influx plan, an employee code of conduct, child protection strategy stakeholder engagement strategy and communication strategy during the project implementation phase.

The project is located in areas that are settled therefore most of the workers may end up renting accommodation in the towns and from home owners. For those who may reside in camps provided by the contractor, the camps camp will have the necessary social service amenities like health, water and sanitation facilities for the workers.

Residual Impacts (Nature of Impact, Geographic Scale, Significance)

The nature of impacts (will be negligible along proposed project road. The impacts geographical scale will mainly be localized to construction sites only and impacts significance will be negligible.

Recommendations

Adherence and compliance to the ESMP

8.6.3.13 Road Safety

Impacts

Road safety related impacts that are expected to occur as a result of the reconstruction project include:

- Possible interference with the normal flow of traffic during construction will have potential effects on travel times.
- Generation of dust and gaseous emissions from machinery may have potential implications to public health.
- Potential disruption of drainage systems leading to possible ponding and hence attracting vectors breeding.
- Potential risks to road safety from trucks transporting construction materials to the road sections.
- Possible health risks from elevated noise levels, especially for any night time construction activities.
- Risks to pedestrians and wild animals moving within the road corridor during the works (pedestrian traffic conflicts, slips and falls into drains and embankments, etc.).

Mitigation Measures

- Before commencement of construction activities, the contractor, shall be required to come up with Traffic Management Plan to aid traffic movements at sites;
- The contractor will be required to place trained traffic marshals strategically at operations sites;
- Installation and maintenance of appropriate road safety provisions (road furniture, speed controls etc.) before commissioning as well as during the operation of the project.

Residual Impacts (*Nature of Impact, Geographic Scale, Significance*)

- During construction phase, the nature of impact is negligible. The impacts geographical scale will mainly be localized to construction sites only and impacts significance will be of major significance.
- During operation phase, the impacts will be localized and significant.

Recommendations

Adherence and compliance to the construction ESMP

8.6.4 Cumulative Impacts

Cumulative impacts are the impacts, which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

The proposed project fall within an any that highly that can be classified as urban peri-urban, rural with the primary land uses being settlement, urban centres, markets and agricultural farms... Based on the forgoing the construction of the road and the spur roads are insignificant in relation to the local to regional scale of habitat and land use related changes that have taken place. There will be no impact to flora and fauna due to the limited spatial

scale and short temporal duration of the project, in relation to the present human and environmental pressures that they are exposed to. No threatened species of flora or fauna have been recorded in the proposed project area

In the context of previous road construction projects that have been completed all over the county no significant environmental impacts have been recorded, therefore the proposed project is expected to register a very insignificant impacts. In this regards, the cumulative impacts on the soils, vegetation, habitat, biodiversity and socio-economic set up of the area are considered insignificant.

Due to the spatially restricted scale of the project, any inadvertent pollution arising from the operations would be localized and mostly site-specific, but it is expected that such incidents will not arise on the basis of the proposed mitigations. The scale of fugitive particulate material and the generation gaseous emissions and their impacts on the surrounding environment will be negligible on account of the scale of the operation, its temporary nature, and the mitigations that have been proposed.

CHAPTER 9.0: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

9.1 Introduction

Environmental and Social Management Plan (ESMP) is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced. Environmental and Social Management Plan (ESMP) involves the protection, conservation and sustainable use of the various social and environment elements or components. The ESMP for the proposed project provides all the details of project activities, potential impacts, suggested mitigation measures, desired outcomes, objective indicators, responsibilities and commitments proposed to minimize environmental impacts of activities, including, monitoring and evaluation during implementation and decommissioning phases of the project.

The tool for achieving this is the incorporation of an Environmental and Social Management Plan (ESMP) into the ESIA to ensure adherence and future compliance with legislation, good environmental performance, and integration of environmental and social issues into the project decision. The ESMP provides the means of assessing the accuracy of the predicted project impacts and the monitoring of the effectiveness of the proposed mitigation measures contained in the ESIA study report. The ESMP should therefore indicate how the environmental concerns highlighted in the ESIA would be managed.

9.2 Objectives of the ESMP

The objectives of the ESMP are to:

- Adhere and address necessary legal frameworks and other requirements;
- Promote environmental management and communicate the aims and goals of the project ESMP to all stakeholders;
- Incorporate environmental management into project design and operating procedures;
- Ensure all workers, contractors, sub-contractors and others involved in the project meet all legal and institutional requirements with regard to environmental management;
- Provide a framework for implementing commitments of the project (i.e. mitigation measures identified in the EIA);
- Prepare and maintain records of project environmental performance (i.e. monitoring, audits and compliance rating); and
- Prepare an environmental monitoring plan whose aim is to ensure that the negative environmental impacts identified in Chapter 7 of this EIA report are effectively mitigated by way of design, construction, operational and decommissioning stages of the project.

- Respond to unforeseen events and
- Provide feedback for continual improvement in environmental performance

9.3 Cost of implementation of the ESMPs

For effective implementation of the ESMPs, the project must establish an Environment, Health and Safety (EHS) unit that will be responsible for *Project environmental Monitoring and Evaluation to ensure compliance to NEMA*. The project contractor will be required to produce periodic reports on project environment monitoring to be sent to the concerned agencies for information and supervision. The contractor will be responsible for all costs of implementing the project's EIA license conditions, including the ESMPs and the actual costs of public involvement in the ESIA process. Hence all costs proposed in the ESMPs below will be incurred by the project contractor. The costs outlined are current costs mainly for project environmental monitoring and evaluation to ensure compliance to NEMA. To estimate future costs, an increase to cover annual inflation should be applied. The costs for actual activities should be included in the main bill of quantities of the project.

Table: 8 Environmental and Social Management Plan - Construction, Operation and Decommissioning Phases

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)		
Construction phase	Construction phase					
Physical and Topographic Aspects	 Slope gradient maintenance and controlled borrow pits and quarry excavation to avoid vertical faces and slopes and possible scree or mudflows during heavy rains Erosion control measures in excavated borrow pits areas and working sites along the road Site reclamation or rehabilitation after exhaustion of borrow sites, quarries and during decommissioning phase of the project. 	Contractor/KeNHA/Supervision Consultant	Continuous	As appropriate		

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Air Pollution due to Dust Generation and Air Emissions	 Sprinkling of water on dry and dusty surfaces regularly including the access roads. Add suitable soil stabilizers such as crushed aggregate stones on access roads or pave access roads to control dust. Erection of dust screens during construction especially at the workers' camps around public institutions and market centres. Dust control measures should be adopted at the concrete batching plants, providing adequate PPE to staffs, canopying loading points, erecting dust screens around the plant and covering trucks ferrying roads works materials. Instituting wet crushing at the crusher to reduce fugitive dust emission The contractor is expected to conduct separate ESIAs for the batching plants and monitor the dust levels periodically Re-vegetating exposed areas during the operation phase of the project. Sprinkling water along the diversion routes or earth along the road section. 	Contractor/KeNHA/Supervision Consultant	Monthly Monthly	As appropriate
	 Slowing the speed of traffic by using bumps to reduce dust levels from vehicles utilizing the road during construction. SOCIAL IMPACT ASSESSMENT STUDY REPORT F CHEMELIL-MUHORONI-KIPSITET C674 (FORMERLY 	FOR THE PROPOSED RECONSTRUC	TION TO BITUMEN STA	

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Noise Pollution 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 all the time to avoid excessive noise generation. Ensure that all workers wear ear muffs 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 Environment Management and Coordination, Noise and Excessive Vibrations Pollution Control Regulations 2009. Support facilities such as hard rock quarries should adopt controlled blasting techniques, preventing flying rock debris 	Contractor/KeNHA/Supervision Consultant	Monthly	-As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
1 USSIDIE IIIIPACES	and high intensity vibrations. The management should equally observe relevant explosives use and 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 all the time to avoid excessive noise generation. Ensure that all workers wear ear muffs 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 Environment Management and Coordination, 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.	Responsible party	Frequency/1mmg	Budget (KSIIS)
	The management should equally observe			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	relevant explosives use and blasting permits provided by the Inspector of Mines and Geology.			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Mitigation Measures Maximizing the rate of recycling of road resurfacing waste either in the aggregate (e.g. reclaimed asphalt pavement or reclaimed concrete material) or as a base; 			
	 Provision of bottle and can trash disposal receptacles at camp, offices and parking lots during operation to avoid littering along the road. 			
	 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. 			
Waste Management (Solid and Liquid	 Develop and implement a Construction Waste Management Plan before start of the project. 	Contractor/KeNHA/Supervision	Monthly	-As appropriate
effluent)	• complying with provisions of the Environmental Management and Coordination, Waste Management Regulations 2006	Consultant		appropriate
	 Sub-contract a NEMA licensed waste handling firm to collect solid wastes on regular basis and dispose off in approved dumping sites. 			
	 Drainage outfalls should be properly constructed to be able to self-clean and SOCIAL IMPACT ASSESSMENT, STUDY REPORT F CHEMELIL-MUHORONI-KIPSITET 6674 (FORMERLY 	OR THE PROPOSED RECONSTRUC C34) ROAD	TION TO BITUMEN STA	
	 Establishment of functional domestic waste handling facilities such as septic systems, grease traps and separation of grey and black water systems 		1	

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Surface water quality	 Ensure t Drainage structures that will be constructed –cross culverts, at the river courses be at appropriate positions. Stone pitching and side drains to cover meaningful lengths along the prone protection areas. Timing of the construction of proposed bridges to coincide with dry periods when water levels in the rivers are low to avoid possible water pollution. Contractor to avoid dumping of waste materials within the riparian zones/ within the watercourses. Cement mixing trucks should be washed at designated areas only. Ensure regular maintenance of plumbing 	Contractor/KeNHA/Supervision Consultant	Monthly	- As appropriate
	 system to avoid spillage of wastewater. Discharge of partially treated sewage into septic tanks Ensure regular maintenance of plumbing 			-
Soil Erosion	 system and septic tanks to avoid spillage of raw sewage. Ensure surface runoff generated on impervious surface is not channeled directly to steep slopes. 	Contractor/KeNHA/Supervision Consultant	continuous	-

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Provide grassed water ways along the access roads. Construct flow breaks on roadside drainage channels. The contractor will source materials such as gravel, sand, ballast and hard core at the project locality. Consultation should be held with the community members and their representatives on the best sites to source materials and rehabilitation measures should be agreed. It is recommended that environmental impact monitoring should be conducted for such activities or in consultation with respective County Directors of Environment to ensure environmental conservation and rehabilitation after use. All exhausted quarries and borrow pits should be isolated, protected and rehabilitated to usable state before the contract closure. 			-
Loss of Vegetation Cover and Biodiversity	•	Contractor/KeNHA/Supervision Consultant/KFS/KWS	Monthly	-
	·			As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Separate EIAs should be conducted for camps, borrow pits, quarries, boreholes (if any) and other ancillary facilities. Minimize clearing and disruption of riparian vegetation. Provide adequate protection against scour and erosion; and consider the onset of the rainy season with respect to construction schedules. Minimize clearing of indigenous plant species and replanting of indigenous plant species in disturbed areas. Explore opportunities for habitat enhancement through reduced clearance to conserve or restoration native species. Employ vegetation rehabilitation techniques to recover lost plant cover such as Reforestation and Afforestation. The contractor is expected to comply with the National Sand Harvesting Guidelines provided by NEMA and the County Governments Undertake an inventory/ Review existing information on species and habitats in the project area. Contact appropriate agencies early in the planning process to identify potentially sensitive ecological resources 			-

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 that may be present in the project area. Conduct pre-disturbance surveys in order to locate site facilities away from important ecological resources (e.g., wetlands, important upland habitats, sensitive species populations). Ensure activities don't pose minimal impacts to riverine flora and fauna. Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. 			
Road Safety	 Avoid long traffic diversion roads. Water diversions to ensure dust is minimized hence easier visibility for drivers. Ensure Installation and maintenance of all construction signs, signals, markings, and other devices used to regulate traffic, including posted speed limits, warnings of sharp turns, or other special road conditions. . 	Contractor/KeNHA/Supervision Consultant	Periodically	- As appropriate PPC
Occupational Health		Contractor/KeNHA/Supervision	Monthly	-
and Safety	•	Consultant	, and the second	As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Develop and enforce a fleet management plan for road construction that includes measures to ensure work zone safety for construction workers and the travelling public. Establishment of work zones to separate pedestrians and livestock travelling by foot from vehicular traffic and equipment by routing of traffic to alternative roads where possible. Regular issuance of appropriate PPEs and regular trainings on proper use and maintenance of PPEs Conduct basic Occupational Health Training programs to construction workers during construction phase. Ensure workers are oriented to the specific hazards of individual work assignment. Conduct toolbox talks focusing on relevant health and safety issues. HIV/AIDS, STDs awareness, training and prevention services to be offered throughout the project period. A Code of Conduct should be distributed to all workers, and health personnel should reinforce their efforts to combat diseases during the construction period. 			-

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Workers to be sensitized on the consequences of social ills and promiscuous behaviors (over consumption of alcohol, STDs, HIV /AIDS etc). Contractor to establish mobile clinic within the construction sites Use protective barriers to shield the public from vehicular traffic, regulation of traffic flow by warning lights, design of the work space to eliminate or decrease blind spots, and ensure reduction of 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. Issuance of permits to work when undertaking hazardous tasks 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 work space (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. Working under personnel on elevated structures should be 			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 avoided. 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. 			
Material Sites and Material Haulage	 Environmental impact assessments (EIA) to be undertaken prior to extraction of materials from identified sites and approved by NEMA. Operations of the materials sites to be guided by respective management plans established and approved under the ESIA, Material extractions and delivery should only be done during the day. If borrow pits and quarries are operated, they be fenced off. Proper handling and management of liquid effluent and used waste oil to forestall incidence of surface water bodies 	Contractor/KeNHA/Supervision Consultant	Quarterly	As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Any abstraction of water from the existing river systems or from boreholes should be undertaken after acquisition of the prerequisite licenses, Rehabilitation of materials sites to take place upon exhaustion (Contractors will provide appropriate rehabilitation plans for each material site). If commercial material sources are adopted, the Contractor(s) should ensure due diligence process is followed by the suppliers at all times, Material extraction and haulage should be done in dump conditions to keep dust low, especially if it is located within settled areas. 			-
Soil contamination	 The waste management hierarchy will be followed during the construction phase. According to this hierarchy, source reduction of waste will be the first option and disposal of unavoidable waste as option of the last resort; Undertake routine preventive maintenance of motorised equipment to avoid any fuel leakage and spills; Storage of fuels and oils should be undertaken in a manner that does not allow leakage to the soil as the fuel can 	Contractor/KeNHA/Supervision Consultant	Quarterly	As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	readily infiltrate the soils polluting the soils, ground and surface water; and Collect and dispose of all waste generated from project activities in accordance with EMCA (Waste Management) Regulations 2006 and international best practice • The Contractor shall ensure that all wastes generated during construction activities such as conductors, steel and metallic bars, insulators and other accessories are collected and disposed of appropriately at designated sites; • All plastic waste generated (at campsites and in the course of undertaking works) such as mineral water bottles, polythene bags, jerry cans, will be collected preferably in mobile vans and handed over to a licensed waste collector or re used;			
	Soil and gravel should be shaped and compacted immediately after transport to its destination. Spoil from the earthworks should be dumped in a central place and covered			
	Maintain spill kits at the contractor's garage, workshops and those areas experiencing spillages.			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Storage of oil and tar drums should be done on concrete floors to prevent exposure of soil to contamination Construction activities should be carried out during the warm seasons. This will aid in compaction of the surface material and reduce the loss of soil and gravel by storm water runoff Re-vegetation of excavated areas to ensure ground stability. Scour checks and stone pitching should be done on steep sections of the road to minimize erosion 			
Social Impacts	 The contractor should develop and implement labour influx plan, an employee code of conduct, child protection strategy stakeholder engagement strategy and communication strategy during the project implementation phase. The project is located in areas that are settled therefore most of the workers may end up renting accommodation in the towns and from home owners. For those who may reside in camps provided by the 	Contractor/KeNHA/Supervision Consultant		As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	contractor, the camps camp will have the necessary social service amenities like health, water and sanitation facilities for the workers. • The materials should be sourced from			
Land Resources	borrow sites and quarries after ESIA/ EIAs and rehabilitation plans are prepared and approved by NEMA; There should be adequate re-use of the excavated waste materials; Where compensation and relocation are required, land value should be determined by independent surveyor/ valuer or other component body such as the Ministry of Lands; The explosives should not be kept on the sites; instead they should be delivered to the site as and when necessary from special storehouses managed by the contractor; There should be adequate landscaping, backfilling and draining of the depressed areas to prevent breeding grounds for disease vectors, this should be ascertained by KeNHA or NEMA County Directors; The borrow pits and quarries should be located more than 500 metres from the	Contractor/KeNHA/Supervision Consultant	Continuous	As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	watercourses and in a position that should facilitate the prevention of storm water run-off to prevent run off from the site entering the water course • Adequate notice should be given in advance to the nearby communities of the intention to excavate the borrow pits and quarries Blasting should take place at designated times and the affected public within approximately 5km radius duly informed;			
Operational phase				
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 in town areas and near public institutions Install no hooting signs in sensitive areas such as near schools, etc. 	Contractor/KeNHA	Monthly	- As appropriate
Increased Generation of Storm Water	 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. 	Contractor/KeNHA	Continuous	- As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Use of vegetated swales, filter strips, terracing, check dams, detention ponds or basins, infiltration trenches and infiltration basins. Repair works to be carried out in dry weather to prevent runoff of asphalt or cement materials. 			-
Loss of human and animal life due to increased road accidents	 Install speed calming measures next to public institutions, towns and settlement Provide road signages all along the road Conduct road safety sensitization programmes. Carry out Risk Assessment to identify risk areas and provide appropriate prevention measures. 	Contractor/KeNHA	Continuous	As appropriate
Road Safety	 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, specifically those related to pedestrian facilities 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 	Contractor/KeNHA	Continuous	As appropriate -

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Installation of measures to reduce collisions between animals and vehicles (e.g. use of signs to alert drivers on road segments where animals frequently cross). Prepare an emergency preparedness and response plan in coordination with the local community and local emergency responders. Comply with OSHA 2007 requirements, they include; Carrying out Safety Audits. Implementing DOSHS improvement orders. Carrying out EHS Risk Assessments. Involve all the relevant stakeholders during the audit so as to incorporate suggested EHS measures into the report. 			-
Increased Generation of Solid Waste	 Maximizing the rate of recycling of road resurfacing waste either in the aggregate (e.g. reclaimed asphalt pavement or reclaimed concrete material) or as a base. Incorporating recyclable materials to reduce the volume and cost of new asphalt and concrete mixes. 	Contractor/KeNHA	Continuous	-

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Collecting road litter or illegally dumped waste and managing it according to the recommendations in the General EHS Guidelines. Provision of bottle and can recycling and trash disposal receptacles at parking lots and bus stops to avoid littering along the 			- As appropriate
	 road. Collecting animal carcasses in a timely manner and disposing them through prompt burial or other environmentally safe methods. 			-
	 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. Management of all removed paint 			-
	materials suspected or confirmed of containing lead as hazardous waste. • Grinding of removed, old road surface material and re-use in paving, or			-
	 stockpiling the reclaim for road bed or other uses. Ensure implementation of the project's operation phase Waste Management Plan. Comply with EMCA Cap 387 Waste 			

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	Management Regulations, 2006.			
Occupational Health and Safety	When undertaking road repairs, use protective barriers to shield workers from traffic vehicles, regulation of traffic flow by warning lights, design of the work space to eliminate or decrease blind spots, and ensure reduction of maximum vehicle speeds in work zones.	Contractor/KeNHA	Continuous	-
	 Training of workers in safety issues related to road maintenance activities. When undertaking road repairs, ensure safe practices for work at night and in other low-visibility conditions, including use of high-visibility safety apparel and proper illumination. When repairing the road, use asphalt product of appropriate specification and ensure 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. Ventilation of indoor areas where vehicles or engines are operated or use of 			- As appropriate

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 exhaust extractor hose attachments to divert exhaust outside. Carry out Safety Audits. Implement DOSHS improvement orders. 			- -
Soil Quality Degradation	 Rehabilitate borrow areas. Revegetate cleared areas. Ensure proper drainage infrastructure along the road. Used oil and spills should be disposed in an environmental friendly manner. 	Contractor/KeNHA/Public	Continuous	As appropriate -
Risk of spread of invasive species	 Reduce open gaps in road reserves by planting appropriate tree species suitable for highway or road side tree planting Monitor composition of species regenerating along road reserves and take prompt actions in case of emergence of invasive species Carry out routine road reserves maintenance mainly to clear bushes that may harbour invasive species. 	Contractor/KeNHA/Public	Continuous	As appropriate
DECOMMISSIONIN Demolition waste	 Use of an integrated solid waste management system i.e. through a hierarchy of options: Source reduction Recycling 	Contractor/KeNHA	at the time of decommissioning	- -

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
	 Composting and reuse Combustion Sanitary land filling. All buildings, machinery, equipment, and 			- - -
	others that will not be used for other purposes must be removed and recycled/reused as far as possible. • All foundations must be removed and			-
	recycled, reused or disposed of at a licensed disposal site. • Where recycling/reuse of the machinery, equipment, implements, structures,			-
	partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site. • Donate reusable demolition waste to			-
	charitable organizations, individuals and institutions.			-
Noise and Vibration	 Sensitize workforce including drivers of construction vehicles. Install sound barriers for pile driving activity. Install portable barriers to shield 	Contractor/KeNHA	at the time of decommissioning	As appropriate
	 compressors and other small stationary equipment where necessary. Proper maintenance of all equipment. Workers near high level noise to wear safety and protective gear. 			- -

Possible impacts	Mitigation measures	Responsible party	Frequency/Timing	Budget (Kshs)
Dust Emission	 Spray demolished piles of earth with water. Avoid pouring dust materials from elevated areas to ground. Cover all trucks hauling soil, sand and other loose materials. Provide dust screen where necessary. 	Contractor/KeNHA	at the time of decommissioning	As appropriate -
Site degradation	 Implement an appropriate re-vegetation programme to restore the site to its original status. Consider use of indigenous plant species in revegetation. 		at the time of decommissioning	As appropriate

9.3 GENERAL EHS PLANS REQUIREMENTS IN CONSTRUCTION PROJECT

9.3.1 Occupational Health and Safety Plans

The plan should be having details on the following listed topics.

Table 5: Health and Safety Plan Content

No	CONTENTS OF THE HEALTH AND SAFETY PLAN	CLARIFICATIONS
1	Contractors Health & Safety Policy /	The policy should be placed at selected places within the camp(s) and
1	Statement	offices. It should be clear, visible and legible in English and Kiswahili.
	Management & Supervision	This will be in form of a flow chart, to be displayed clearly in specific
2	Organizational Chart.	offices at the camps. It will assist in identifying the respective
	Organizational Chart.	management staff and supervisors.
		The assessment should consist:
		(i) Risk assessment leader, (ii) Risk assessment team members (iii) Date
		of risk assessment.
3	Construction Risk Assessment	This will involve Identifying the risks, their description, probability of
		getting involved in the risk and impacts from the risk. A description of
		control measures/procedures/methods to manage the risk will be
		provided.
		This will involve listing risk types, their description, probability of
1	Fall Protection Plan	getting involved in the risk and impacts from the risk. Control
4	ran Flotection Flan	measures/procedures/methods to manage the risk and the responsible
		person.
5	Hazardous Work/Activities-Method	Hazardous work/Activity (HWA) method statement will be provided by
5	Statements	listing the HWA, their description, Method To be followed / Used to

		safely carry Out the hazardous activity and the responsible person.
6	Personal Protective Equipment	A billboard with clear drawing of PPEs and their description will be
O	Requirements	provided.
	Measures to Control the Condition and	Description of various tools will be provided. Measures & procedures to
7	Use of Tools and Equipment	ensure safe condition & use of tool/equipment and responsible person
	Ose of Tools and Equipment	named.
8	Fire Prevention and Control Measures	Details of control and safety measures to be taken during storage and use
0	The Flevention and Control Measures	of the inflammable substance
	Environmental Protection Measures	A schedule of waste materials and effluents types of wastes will be
		identified. Description of waste/effluent generated on the site will be
9		provided. Disposal/ effluent disposal methods and procedures to be
		named. Further, name and contact details of the company responsible for
		disposal of waste will be provided.
		First Aid Arrangements will include: Name(s) of first aiders on the work
10	First Aid Arrangements -	site. Number of and location of first aid boxes
		Details of other first aid/emergency medical arrangements made
11	Construction Site Signage	There will be a graphic illustration of the signage and the description on
	Construction Site Signage	where to use/wear.

9.3.1.1 Occupational and Safety Concerns during Construction Phase

Based on the identified hazards, the contractor shall evaluate the risk by considering the likelihood of occurrence and severity. The likelihood of occurrence shall be based on Very Low, Low, Medium, High or Very High. A numerical system can also be used ranging from 1 to 5. The extent of the rating shall be based on the controls that the contractor has put in place. It shows an evaluation of the risk, severity and causal factors.

The risk assessment shall be used to priories the remedial measures. Risks with high evaluation scores shall be given priority for remedying the situations.

9.3.1.2 Occupational and Safety Concerns during Operation Phase

There are some periods towards the end of the construction phase that the road may be opened intermittently for public use. During these periods the workers may still be undertaking construction works on the project road. This implies that the workers shall be exposed to vehicles and pedestrians form the public with risks of accidents that can lead to serious accidents and fatalities.

Towards this, the remedy shall be:

- to enhance safety signage to forewarn the road users that the road is still under construction some sections
- Use traffic marshals to direct other road users
- Demarcate work areas with physical barriers. These barriers should have on them retro reflective materials for enhanced vision in the night
- Where appropriate, slow down traffic by use of bumps, rumble strips or zigzag bollards where appropriate.

9.3.2 Borrow Pit/Quarry Rehabilitation Plan

Table 14: Material Site History, Description of Current Status and Details on Decommissioning

Name of Material Site	Sites operational Functional history	Records Of Assessment Activity By Authority (NEMA, OSHA etc)	Records on Contractors Interaction with Owner and Local Community	Impacts on the Site and Community due to Interactions
	When it was last utilized?Was there any agreement on rehabilitation?Was it rehabilitated after use?	Are records available or not available?	• Were there any records (official correspondence) between stakeholders?	Were there any impacts?How were they addressed?
	DETAILS ON PROPOSED DECOMM			
Names of	ative consideration	Type of Decommissioning Approach	s of Work	Technical Baseline and Assumptions for the Project
material site to be indicated after selection by the contractor	• List of alternatives (water pan, do nothing alternative, fill up, dump site etc).	• Involve the quarry owners in planning the decommissioning type	• Clarification on work schedule with details of decommissioning activities.	• List and review the assumptions and possible impacts
	MANAGEMENT OF THE MATERIAL SITE			
	Contract Out, Use of Construction Manager	Training	Schedule	
	Details of contract type	Details of contract type		

Name of Material Site	Sites operational Functional history	Records Of Assessment Activity By Authority (NEMA, OSHA etc)	Records on Contractors Interaction with Owner and Local Community	Impacts on the Site and Community due to Interactions
	WORK AND ENVIRONMENTAL PROTECTION DURING DECOMMISSIONING			
	Occupational Safety	upational Exposure	Environnemental Compliance Program (Audits etc.)	Safety Analysis and Review of Decommissioning Activities
Names of material site to be	OSHA guidelines to be adhered to	Occupational exposures and mitigation.	• Were Audits carried out, EMP adhered to? etc	• Details on the safety analysis while decommissioning.
indicated after selection by the	WASTE MANAGEMENT			
contractor	Waste Minimization Techniques Used	Waste Handling	Waste Management	
	FINAL SITE SURVEY			
	Independent Verification Inspection by N	IEMA County Environmental Officer	Independent Verification by	y Community Leaders

9.3.2.1 Borrow Pits and Quarries Reinstatement during and After Project Completion

The Contractor, in consultation with the RE and the supervising environmental consultant to coordinate in implementing the EMP on borrow pits and quarries. Status of the material sites should be reported on monthly basis and when need be during the monthly progress meeting between the Contractor, Client and the supervising engineers.

9.3.2.2 Suggested Contents of Borrow-pit/Quarry Lease Agreement

Owners of the possible material sites will likely to be gullible while making legally binding agreement with the Contractor – in case the contractor intends to acquire material from such land parcels and hence the related agreements.

To avoid the Contractor coming up with a one-sided unconscionable agreement while leasing a material site, it will be necessary that an ESIA should be done before the starting the extraction of construction materials. The ESIA should have a copy of the Lease Agreement made between the lessor and the lessee. Parallel to NEMA's ESIA approval process, the following issues should be complied with.

Before the Start of Quarrying Activities

- i. Copies of the Agreement should be presented to the following people for approval:
 - a) Area NEMA County Director, to be included in the ESIA report for the site.
 - b) KeNHA's Deputy Director for Environment and Social Safeguards
 - c) Area Chief or sub-chief
 - d) Community opinion leaders, a man and a woman.
- ii. Once the above listed stakeholders have reviewed and commented on the proposed agreement, the project's Resident Engineer will give the final decision on the proposed material borrow site, either reject it or accept it, based on the comments from a) d) above.
- iii. KeNHA the project proponent in consultation with NEMA will thereafter make the final decision.
- iv. To facilitate fast review of the agreement, a template with a compliance checklist will be given to the stakeholders a) to d) above to ascertain Contractor's level of compliance.

After Completion of Quarrying Activates

- i. A certificate of material site reinstatement should be filled in by a) to d) and later handed over to the RE, KeNHA for approval
- ii. Outstanding issues should be handled by the Contractor in reference to the agreement

9.3.3 Vehicle/Traffic Management Plan

During construction phase of the proposed road, the Contractor should manage the Motorized and Non-motorized traffic in the following ways:

- To ensure that disruptions to traffic and road transport are minimized.
- To ensure that the roads remain open to traffic during construction activities;
- Prior to construction activities, the Contractor will install all signs, barriers and control devices needed to ensure the safe use of the road by traffic and pedestrians.
- Information, warning and direction signs will be incorporated provided at specific places along the project road. Vandalised signs should be replaced.
- County authorities and residents in a working area will be consulted before any detours for construction or diverted public traffic are established;
- Disposal sites and haul routes will be identified and coordinated with local officials;
- Construction vehicles will use temporary roads constructed for that purpose to minimize damage to agricultural land and local access roads.
- Where local roads are used, e.g. haulage of raw material from identified sites; they will be maintained and reinstated to their original condition after the completion of work.

9.3.4 Waste Management Plan

Specific sources of liquid and solid waste will be:

- i) Bulk earthworks,
- ii) Waste from site office/camp,
- iii) Used spare parts from trucks, plant and equipment

Some of the waste will include waste oil, effluent disposal (septic tanks), drilling slurries and drilling fluids, wastewater from site and dredging. The table below has details on managing the waste during construction period.

Table 6: Waste Management Plan during Construction Phase

Process	Waste Management during Construction Phase		
	Requirements	Responsibility	Timing
	Spoils from bulk earthworks will be	Construction	Throughout the
Actions	stockpiled and reused where possible	Manager	Construction period
	Waste from site office/camp and repairs and maintenance will be segregated at source and disposed as per the procedure for solid	Site Office Project Manger	Throughout construction works

	waste management		
Performance Indicators	No waste will be deliberately or unintentionally released	Site Manager / Construction Manager	Throughout construction works
Monitoring	Waste quantities measured and recorded on a daily basis	Site Office Project Manager	Throughout construction works
Reporting	Reporting to Site Office Project Manager and HSE Advisor	All staff	Throughout construction works
Reporting	Any reporting to Resident Engineer and NEMA	Site Office Project Manager	Throughout construction works
Corrective Actions	Awareness and training of waste handling.		Throughout construction works

9.3.5 Camp Design / Installation Plan

The Contractor's camp(s) for labour, accommodation, offices and construction plant sites shall be identified based on the following guidelines.

- The camp should be constructed in accordance with contract documents, adhering to the specified and required standards.
- The construction site shall be located minimum distance from the road project site and away from any settlement (Min 1km). This will keep off unauthorized persons into the camp and the associated and unnecessary interference.
- The camp should be enclosed with boundary wall, with only one guarded entrance.
- Movement of the workers, in and out of the camp should be registered during the nighttime. This will prevent possible illegal activities, e.g. pilfering of camp's items, ill behaviors from workers at night etc.
- Camp activities should not create any disturbance to the local community.
- Operation of the plant and machinery should be restricted to daytime only
- Care should be taken while starting and moving the heavy vehicles, there is a possibility that children of near settlement may be playing with machinery parked outside the camps.

9.3.6 Ancillary Plans

Ancillary plans for the Construction sites should include:

Facilities at the Workmen's Camp

- Potable water supply in quantity and quality,
- Safe access road is required at camps
- Waste (all kind of solid and liquid wastes) generated should be disposed off in accordance with NEMA's Waste Management Regulations) 2006, Part II, Solid Waste, which has provisions on disposal methods

Sanitation Facilities

- Construction camp shall be provided with sanitary latrines and urinals.
- Closed drainage systems and the proper treatment systems according to the local conditions should be constructed for the proper flow and effective treatment. The sewage system built for the camp will be operated properly to avoid health hazard, ground water and soil pollution.
- Compost pits will be constructed for the disposal of the garbage and other biodegradable
 wastes generated from the camps. Proper collection, transportation and disposal of the
 wastes will be ensured.

Health care Facilities:

- Health problems of the workers should be taken care of by providing basic health care facilities through a health centre set up at the construction camps.
- The health centre will have at least a qualified medical staff (part time), duty staff, medicines and minimum medical facilities to tackle first-aid requirements for minor accidental cases.
- Arrangements and contacts should be made with the nearest hospital to refer patients of major illnesses or critical cases.

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9.3.7 Spills Prevention and Response Plan

The spill prevention and response plan will provide the Contractor general guidance and procedures to manage project site operations which have potential to cause environmental damage and procedures to follow in case spill occurs. The following discharges - potential pollutants - are likely to occur during construction phase.

- i) Wastewater from washout of concrete;
- ii) Wastewater from washout and cleanout of paint, form release oils, concrete grinding slurry, curing compounds and other construction materials;
- iii) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
- iv) Soaps, solvents, or detergents used in vehicle and equipment washing; and
- v) Toxic or hazardous substances from a spill or other release.

Table 7: Issues of Concern in the Spills Response Plan

	Contractors Areas of Concern in the Plan	Examples of Issues of Concern in the Plan
1	Contractor Responsibilities	 Contractor to follow proper procedures storage and handling of hazardous materials. Train employees to control the identified waste and recyclable products in the containers provided.

		 Maintain Material Safety Data Sheets (MSDS) on file for hazardous chemicals used on the project and ensure employees follow all of the incorporated requirements. Use correct PPEs. 		
2	Fueling and Maintenance of Equipment or Vehicles	 Use drip pans and absorbents under or around leaky vehicles; Dispose of or recycle oil and oily wastes in accordance with NEMA. Clean up spills or contaminated surfaces immediately, using dry clean up measures and eliminate the source of the spill to prevent discharge or a furtherance of an ongoing discharge 		
3	Washing of Equipment and Vehicles.	nollutants from equipment and vehicle washing wheel wash		
4	Disposal of Waste Products	 Separate hazardous waste from construction waste. Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled. Provide waste containers (e.g., dumpster or trash receptacle) of sufficient size and number to contain construction and domestic wastes. 		

In complying with the corrective actions in spillage management, the Contractor is responsible to comply with Hazardous Spill Prevention and Response Plan.

Contractor's non-compliance to spill containment control measures will be communicated to the Resident engineer and supervising OHS advisor,

9.3.8 Emergency Response Plan (ERP)

Emergency/Disaster Preparedness Plans for the Proposed Road Project

The contractor shall develop and implement the guidelines for emergency/disaster preparedness and response as provided below:

- Objective:
 - To define emergency situations that may arise during the construction phase of the project;
 - To prepare emergency response plans in line with the identified emergency situations;
 - To put systems in place to equip facility with emergency equipment;
 - To put mechanisms in place to test the emergency procedures and propose improvements.
 - Keep contacts, both internal and external, of persons in charge for management of emergencies and disasters.
- Emergency situations have been defined as follows:

- Occupational health and safety
 - Fire outbreak
 - Flooding
 - Fatality on site
 - Serious accident leading to multiple personal injuries
 - Illness due to food poisoning
 - Mass illnesses arising from inhalation and contact with hazardous chemicals
- Environmental incidents/Disasters
 - Incidents / accidents that may lead to stoppage of works for more than 1 working day;
 - Incidents that may significantly impart negatively on the project and lead to negative
 publicity within the project neighbourhood and to the media
 - Incidents that may cause damage and harm to the environment, especially pollution to soil, water sources and air pollution.
- The process for Identification of Significant Occupational Safety and Health Risks; Identification of Significant Environment all Aspects has come up with the following as emergency situations that are likely to occur:
 - Occupational Health and Safety incidents:
 - Fire outbreak at residential and offices camps, heavy equipment, plants and motor vehicles:
 - Fatality at site;
 - Multiple serious injuries;
 - Food poisoning from worker's canteen;
 - Camp invasion scare
 - Environmental and social incidents
 - Fire outbreak at the Camp, equipment, and plants;
 - Oil spillage leading to surface and ground water contamination and soil degradation;
 - Chemicals spillage, fire;
 - Camp invasion by local residents due to perceived injustices ranging from employment opportunities, degradation of environment and moral related issues due to labour influx.
- Preventative measures:
 - All Emergency measures shall have preventative measures documented and implemented. These shall be outlined in the risk assessments conducted in section 2 above
 - Whenever new or modifications of processes are put in place, the risk assessment shall be reviewed to incorporate the modification or introduction of new processes.
- Repair and Maintenance of emergency equipment
 - An initial fire survey shall be done jointly with a DOSHS approved fire inspector;

- Emergency equipment shall be procured as per the recommendation if the fire inspector;
- Once the equipment has been procured and installed, there shall be monthly inspections
 by the Health and Safety Officer who shall record observations in a prescribed format.
 For equipment that shall require top up, services for repair and maintenance shall be
 sought;
- Periodic repairs and shall be conducted on quarterly basis or as per the advice of emergency equipment and service provider.

• Emergency response team

An emergency response team shall be constituted. This team shall have the membership and responsibilities as shown in

Table 8: Composition and Tasks of Emergency/Disaster Preparedness Response Team

	EMERGENCY ROLE	RESPONSIBILITIES DURING EMERGENCIES
1.	Emergency Controller	 The overall coordinator of reported emergencies Monitor the situation as it unfolds Contact with GoK Officers and the Consultants Engineers Give media brief where need be Delegate the duties to any other manager where necessary
2.	Assistant Emergency Controller	 Deputize the emergency controller Liaise with affected stakeholder stakeholders Update the emergency controller on feedback from stakeholders
3.	Emergency Coordinator	 Liaise with the emergency services on site Liaise with affected stakeholders Give feedback to the Emergency controller Spearhead the roll call at the assembly points Announce all clear once the emergency situation eases up Write the report and learning arising from the emergency response. Distribute the report to the emergency team
4.	Assistant Emergency Coordinator	 Deputize the Emergency controller Coordinate and translate with the Chinese workers
5.	Emergency Marshalls	 Ensure emergency alarm is raised Mobilize workers in their areas of jurisdiction Where safe to so, ensure that the emergency situation is averted Ensure all workers, visitors and sub-contractors have evacuated to the assembly point

- Emergency drills/practices
 - An emergency response centre shall be established on site. Likewise, an alternative emergency centre shall be designated in event that the aforementioned response centre is rendered out of use;

- A response plan shall be developed for each of the identified emergency situations;
- Each of the identified drills shall undergo tests at least once a year
- Lessons learnt during the drills shall be documented and improvements for future drills and emergencies proposed and implemented in the next drill / emergency.

• Emergency contacts

- Emergency contacts shall be documented and distributed in all offices and notice boards including security gatehouses;
- The contacts shall include: police, fire emergency services, ambulance services
- The contacts list shall be revised at least once a year to ascertain validity telephone numbers and individual's names.

9.3.9 Environmental Awareness Plan

The plan will focus on training, awareness and competence for the site staff with the objective of making them able to work and address tasks that have the potential to cause a significant environmental impact. Environmental awareness and training shall be achieved by:

- Site induction, including relevant environmental issues.
- Environmental posters and site notices.
- Method statement and risk assessment briefings.
- Toolbox talks, including instruction on incident response procedures.
- Key project specific environmental issues briefings.

9.3.10: Decommissioning Plans for the camps and other installations

A decommissioning and abandonment plan for camps and ancillary facilities should be prepared at least three months prior to decommissioning. The plan should consider the following:

- Relocating all un-used tools and equipment to an appropriate storage site.
- Any equipment that has gone into waste should be treated as waste and disposed of in Appropriate ways for example re-use, recycle, reduce or sold to recycling plants
- Demolition of any additional structures that were constructed/installed by the contractor
- Dispose of all the generated waste in accordance with the waste management plan and Waste management regulations
- Cleanup of the site and handover the site to the Client and demobilize/withdraw all Personnel that had been posted to the site including the security personnel. A handover acknowledgement should be written/documented.
- An Environmental Evaluation Report (EER) should be prepared to determine if the activities carried out at the site have caused any detrimental effects and if any so as to discuss mitigations and restoration measures.
- In-depth Environmental Studies for the actual removal of equipment (demolition) to be carried out.

9.4 ENVIRONMENTAL MONITORING

Environmental monitoring is the systematic measurement of key environmental indicators over time within a particular geographic area. Monitoring should focus on the most significant impacts identified in the ESIA. The main aim of ESIA monitoring is to provide the information required to ensure that project implementation has the least possible negative environmental impacts on the people and environment. Various types of monitoring activity are currently in practice. During the ESIA study baseline monitoring on basic environmental parameters in the project area of influence was conducted. Subsequent monitoring would help assess the changes in those parameters over time against the baseline. Other main types of environmental monitoring that will be conducted are briefly described below:

(a) Impact Monitoring

The biophysical and socio-economical (including public health) parameters within the project area, must be measured during the project construction and operational/utilization phase in order to detect environmental changes, which may have occurred as a result of project implementation e.g. air emission, dust, noise, water pollution etc. (European Commission, 1999).

(b) Compliance Monitoring

This form of monitoring employs a periodic sampling method, or continuous recording of specific environmental quality indicators or pollution levels to ensure project compliance with recommended environmental protection standards. This type of monitoring should be regular and performed over a long period of duration so as to gather sufficient data to draw accurate conclusion concerning project impact.

Table 9: Environmental Monitoring Plan

Monitoring	Frequency			Methodological indicators	Responsible
Impacts	Construction	Operation/Utilization	Decommissioning		entity
1. Noise and	Daily	Semi-annually noise	Daily observation;	Noise level quarterly analysis on log	KeNHA &
vibration	observation;	measurements	monthly noise level	of vehicles and machine servicing;	Contractor
impacts	monthly noise		analysis	trees planted; Number of noise	NEMA
	level analysis			licenses issued	Respective County
				Number of PPE provided/ issued and	Government
				sensitization meetings held.	
2. Impacts on	Daily dust	Monthly air quality	Daily dust	Daily dust observation; quarterly air	KeNHA &
air quality	observation;	analysis	observation;	sampling and lab analysis;	Contractor
	monthly air		monthly air quality	Quarterly reports on PPE provided;	NEMA
	quality analysis		analysis	log off vehicle and machine servicing;	
				sensitization meetings held; frequency	
				of sprinkling water	
3. Destruction	Daily vegetation	-	-	Reports on site zoning program;	KeNHA &
of existing	monitoring			community initiatives held on tree	Contractor
habitats and				planting;	KFS
vegetation				Number of invasive species identified	NEMA,
				Landscaping programme or re-	WRA
				vegetation.	
4. Oil spills	-Daily	-	Daily spills audit	Reports of oil trapping equipment	KeNHA &
	management of		and inspections	installed; number of oil spill incidents	Contractor
	spills		Spill Kit	and corrective measures taken	NEMA
	-				
5. Solid and	Weekly	Monthly reporting of	Weekly wastes	Reports on waste management plans	KeNHA & the
liquid waste	accounting of	waste recorded on the	generated	developed	Contractor
generation	waste and	road		Amount of waste generated;	NEMA
	collection			Facility provided for handling and	Relevant County

Monitoring		Frequency			Methodological indicators	Responsible	
In	npacts	Construction	Operation/Utilization	Decommissioning		entity	
					storage of waste	Government	
					Methods employed for waste disposal		
					Training meetings held		
					Waste water quality analysis results		
					Reports on liquid waste management		
					plans		
					Number of inspections to help		
					identify leaking or blocked pipes.		
6.	Soil erosion	Daily	-	-	Reports on storm water management	KeNHA &	
		monitoring			and soil erosion control plans o site	Contractor	
					Amount of surface run-off and roof	NEMA	
					catchment harvested	Relevant County	
					Water harvesting and storage facilities	Government	
					installed		
7	Visual and	Quarterly	_	_	Reports on public consultations held	KeNHA &	
	aesthetic	assessment			Landscaping program designed and	Contractor	
	impacts	4 55 5 55 115110			implemented	001111111111111111111111111111111111111	
8.	Traffic	Daily traffic	Annual traffic	-	Traffic diversions and management	KeNHA &	
	issues	monitoring	assessment/ studies		plans	Contractor	
					Number of vehicles recorded in		
					weekly basis		
					Number of accidents resulting		
9.	Health and	Daily cases	Monthly assessment	Daily cases	Quarterly reports on health and safety	KeNHA &	
	Safety issues	reported			plans	Contractor	
					HSE training programs	NEMA	
					Records of incidents, accidents,	DOSHS	
					investigations and corrective action	Relevant County	

Monitoring	Frequency			Methodological indicators	Responsible
Impacts	Construction	Operation/Utilization	Decommissioning		entity
				undertaken	Government
				PPE provided, warnings posted, HSE	
				issues closed out and Permit to Works	
				System issued.	
10. Increase in	Monthly	Semi-annually	Monthly	Reports on sensitization forums;	KeNHA &
social vices	reporting of the	assessment by third	undertaking of	sessions held on guidance and	Contractor
	statistics	parties	statistics	counseling on HIV/AIDs and other	Relevant County
				STDs,	Government
				Number of condoms issued out	
11. Land take –	Monthly	-	-	Reports of RAP implementation	KeNHA &
Resettlement	reported value			including compensation for land,	Contractor
and Loss of	of land			structures and crops/ trees damage	National Land
use	compensation				Commission
	and resettlement				relevant County
					Government
12. Pressure on	Daily	-	Daily reporting	Reports of the number of people	KeNHA & The
existing	assessment			accessing social infrastructure	Contractor
infrastructur				Reported cases of grievances or	County
e				conflicts with the community	Governments
				Number of grievances addressed	
13. Rehabilitatio	-	-	Monthly	Reports on vegetation program	KeNHA &
n of project				developed	Contractor
site and				Number of borrow pits and quarries	NEMA
associated				restored	Relevant County
areas				Number of tree species planted	Governments

CHAPTER 10.0. CLIMATE CHANGE AND ROAD INFRASTRUCTURE

Climate change will directly affect road infrastructure in several ways. High temperatures will cause roads to easily develop cracks within a short period after their construction. In addition higher temperatures combined with increased solar radiation may reduce the life of asphalt road surfaces as higher temperatures result in the need for increased frequency of resealing/resurfacing due to the more rapid oxidation of the bitumen (Mills and Andrey, 2002).

Instances of high precipitation will allow new roads to easily develop potholes while existing potholes will deepen fast. Rising water levels in lakes and the sea can also flood graveled and unpaved roads adjacent to shore. The overall direct impact of climate change on roads and its indirect impact on other economic systems are enormous as poor roads resulting from huge potholes can lead to road accidents and, increased vehicle repairs, increased transportation cost for people, food stuff and other goods across the country while vehicular traffic jams can lead to more fuel consumption in addition to huge time lost.

Generally since climate change has wide-ranging effects on our society there is need for a multi-faceted approach involving a range of technical solutions and skills from planning, design, construction and management to best manage its impact in the infrastructure sector.

The anticipated effects of climate change should be manageable with current engineering practice and the materials available, possibly with adaptation. However, to provide certainty that our road network and transport infrastructure can be properly managed, there needs to be more understanding on what infrastructure is susceptible to the impact of climate change, particularly the predicted rise in water levels, increased precipitations and elevated temperatures.

Some of the approaches that can be adopted include:

a. Road Specific

Road specific is one of the major categorizes which is focus on road strengthen including raising the road level, adjust side slope and paving surface. This adaptation options can be applied in flood/drought prone areas.

i. Raising Road Level

This is one solution to adapt to climate change events, especially flooding. The road surface level will be raised to an elevation higher than expected flood level to reduce risk of road

damage and to prevent an inaccessible road during flood event. Ideally the road design level should be 0.5 m higher than highest expected flood level.

ii. Adjusting Side Slope

Side slope should be adjusted from 1:2 to 1:3 or flatter to prevent flood damage and erosion from road surface runoff. Adjusting side slopes from 1:2 to 1:3 will also increase traffic safety of the road.

b. Paving Road Surface

In areas that experience high precipitation, paved roads offer better resistance to flooding, will drain the water from the surface more easily and will reduce the risk of potholes and water stagnation on the road surface. Paved surface will also reduce the risk of water penetrating and submerging the road construction layers and thereby reducing the bearing capacity of the road.

During the dry season, paved road surfaces will reduce the risk of dust on and around the road. It will increase traffic safety on the road and improve the environment for people living along the road.

c. Drainage

A good road drainage system, which is properly maintained, is vital for all type of roads. A good drainage system conveys water from the surface of the road, as well from the different layers of the road structure, to a safe exit (stream or cross drainage structure). The drainage system also intercepts surface water flowing towards the road and conveys water across the road in a controlled fashion. The destructive power of water increases exponentially as its velocity increases. Therefore, water must not be allowed to develop sufficient volume or velocity so as to cause excessive wear along ditches, at culverts or along exposed running surfaces, cuts or fills.

The presence of excess water within the roadway will adversely affect the properties of the materials with which it was constructed. Cut or fill failures, road surface erosion and weakened subgrades followed by a mass failure are all products of inadequate or poorly-designed drainage.

Different types of drainage structures can be utilized: cross drainage, ditches and drains, French drains, drain deflectors, under drains, scour checks, and cut-off ditches or catch water ditches

d Erosion

Erosion is expected to be a major problem, with possible increased rainfall, and to prevent increased erosion might be an important adaptation option to climate change. Some methods

to protect the road and its drainage system include retaining walls, gabion boxes, rip-rap and grass sodding

e Realignment

Realignment is a good solution for climate change adaptation. The cost of new road construction could be lower than the maintenance cost of the present road, especially for roads located close to rivers frequently flooded and causing road damage.

f Revised Road Design Standards

Climate change factors should be added to road design standards, especially focusing on areas with major risks of flooding that might cause erosion and damage to the road. The most important factors are the road levels, the cross drainage of the road and erosion protection of the road.

g Green Planning

This entails tree planting along roads which helps in increasing forest cover in the country and also serve as a carbon sink.

h Monitoring

All roads should be regularly monitored in order to control and propose improvement of the road as well as the area around the road. If an early warning system is established in the area, it should be maintained and monitored regularly.

CHAPTER 11.0: CONCLUSION AND RECOMMEDNDATIONS

11.1 CONCLUSION

The reconstruction and rehabilitation of the Mamboleo-Miwani- Chemelil-Muhoroni-Kipsitet C674 (formerly C34) road to bitumen standard and associated 54kms of spur roads will play a critical role in improving the living standards of the area project area as numerous business will spring up, cost of transportation and repair for motor vehicles and bodabodas would reduce, access to health facilities will be enhanced, enhanced mobility and enhanced security due to ease of doing patrols for the police

The Environmental and social impacts associated with the proposed project road are relatively medium to minor since the road exists and the corridor for expansion is big enough to accommodate the upgrading and other related facilities.

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The road project will equally have negative impacts both in the construction, operation and decommissioning phases, if appropriate mitigation and support measures are not applied. Project impacts are medium to low and most of them can be avoided or mitigated. During construction the community raised a number of issue that they noted could occur which included: frequent accident from project vehicles, bodabodas and other road users due to lack of signages and maintenance of diversions, dust pollution, disruption of business especially for road side traders, delay in travel time if there is no planning of road works and diversion, and slow progress and delay in works due lack of proper planning and capacity of the contractors involved. To mitigate against the impacts it wa highlighted that there is need to properly maintain the diversions from watering and grading, install speed humps especially near centres and schools, offer employment to the locals, installation of signages, payment for disrupted and construction of market stalls

The impacts identified are manageable through application of mitigation measures wherever they occur. The findings of the Environmental and Social Impact Assessment (ESIA) study establish that the road project will elicit positive impacts on the socio-economic environment of the area. Generally it was noted that once the road was completed it improve the living standards of the area project area as numerous business will spring up, cost of transportation and repair for motor vehicles and bodabodas would reduce, access to health facilities will be enhanced, enhanced mobility and enhanced security due to ease of doing patrols for the police.

11.2 RECOMMENDATIONS

The report has strived to give comprehensive mitigation measures and environmental management and monitoring mechanisms which if put in place will minimize or completely eliminate the possible negative impacts. The environmental management and monitoring mechanisms developed in this report should be strictly adhered to, to ensure that the project remains environmentally and technically sound throughout its life. The following recommendations should be adhered to:

- 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 Environment Management and Coordination, Noise and Excessive Vibrations Pollution Control Regulations 2009.
- Slope gradient maintenance and controlled borrow pits and quarry excavation to avoid vertical faces and slopes and possible scree or mudflows during heavy rains
- Erosion control measures in excavated borrow pits areas and working sites along the road
- Site reclamation or rehabilitation after exhaustion of borrow sites, quarries and during decommissioning phase of the project.
- Sprinkling of water on dry and dusty surfaces regularly including the access roads.
- Add suitable soil stabilizers such as crushed aggregate stones on access roads or pave access roads to control dust.
- Erection of dust screens during construction especially at the workers' camps around public institutions and market centres. Dust control measures should be adopted at the concrete batching plants, providing adequate PPE to staffs, canopying loading points, erecting dust screens around the plant and covering trucks ferrying roads works materials.
- Instituting wet crushing at the crusher to reduce fugitive dust emission
- The contractor is expected to conduct separate ESIAs for the batching plants and monitor the dust levels periodically
- Re-vegetating exposed areas during the operation phase of the project.
- Sprinkling water along the diversion routes or earth along the road section
- Provision of bottle and can trash disposal receptacles at camp, offices and parking lots during operation to avoid littering along the road.
- 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.
- complying with provisions of the Environmental Management and Co-ordination, Waste Management Regulations 2006
- Sub-contract a NEMA licensed waste handling firm to collect solid wastes on regular basis and dispose off in approved dumping sites.

- Drainage outfalls should be properly constructed to be able to self-clean and reduce instances of blockages.
- Establishment of functional domestic waste handling facilities such as septic systems, grease traps and separation of grey and black water systems
- Ensure surface runoff generated on impervious surface is not channeled directly to steep slopes.
- Provide grassed water ways along the access roads.
- Construct flow breaks on roadside drainage channels.
- The contractor will source materials such as gravel, sand, ballast and hard core at the project locality.
- Consultation should be held with the community members and their representatives on the best sites to source materials and rehabilitation measures should be agreed.
- It is recommended that environmental impact monitoring should be conducted for such activities or in consultation with respective County Directors of Environment to ensure environmental conservation and rehabilitation after use.
- All exhausted quarries and borrow pits should be isolated, protected and rehabilitated to usable state before the contract closure.
- Separate EIAs should be conducted for camps, borrow pits, quarries, boreholes (if any) and other ancillary facilities.
- Minimize clearing and disruption of riparian vegetation.
- Provide adequate protection against scour and erosion; and consider the onset of the rainy season with respect to construction schedules.
- Avoid long traffic diversion roads.
- Water diversions to ensure dust is minimized hence easier visibility for drivers.
- Ensure Installation and maintenance of all construction signs, signals, markings, and other
 devices used to regulate traffic, including posted speed limits, warnings of sharp turns, or other
 special road conditions.
- Develop and enforce a fleet management plan for road construction that includes measures to ensure work zone safety for construction workers and the travelling public.
- Establishment of work zones to separate pedestrians and livestock travelling by foot from vehicular traffic and equipment by routing of traffic to alternative roads where possible.
- Regular issuance of appropriate PPEs and regular trainings on proper use and maintenance of PPEs
- Conduct basic Occupational Health Training programs to construction workers during construction phase.
- The Contractor shall ensure that all wastes generated during construction activities such as conductors, steel and metallic bars, insulators and other accessories are collected and disposed of appropriately at designated sites;
- All plastic waste generated (at campsites and in the course of undertaking works) such as mineral water bottles, polythene bags, jerry cans, will be collected preferably in mobile vans and handed over to a licensed waste collector or re used;
- Soil and gravel should be shaped and compacted immediately after transport to its destination. Spoil from the earthworks should be dumped in a central place and covered
- Maintain spill kits at the contractor's garage, workshops and those areas experiencing spillages.

• Storage of oil and tar drums should be done on concrete floors to prevent exposure of soil to contamination

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CHAPTER 12.0 REFERENCES

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APPENDICIES

APPENDIX 1. EXPERT LICENSES

APPENDIX 2: PUBLIC CONSULTATION MINUTES

A. KERICHO COUNTY

RECONSTRUCTION OF KISUMU (MAMBOLEO) –MUHORONI-KIPSITET ROAD (C34)

PUBLIC CONSULTATION

MINUTES OF THE MEETING WITH THE KERICHO COUNTY REPRESENTATIVES HELD AT KERICHO COUNTY COMMISSIONERS OFFICE ON 4TH JUNE 2020

Agenda

- 1. Introduction
- 2. Awareness creation and Presentation on the project by the KeNHA expert
- 3. Participants general concerns, suggestions and emerging issues
- 4. AOB

Participants present

- 1. COUNTY REPRESENTATIVES
- 2. KENHA REPRESENTATIVES(SOUTH RIFT & HEADQUARTERS)
- 3. OFFICE OF THE COUNTY COMMISSIONER

(See attached list of attendants)

Minute 1: Opening

The meeting was called to order by DCC Ali Noor at 11.00AM on behalf of the County Commissioner whose apologies he communicated.

This was followed by a word of prayer by Ms. Leah Chirchir.

The DCC then conducted a round of self-introductions and there after invited the KeNHA Representative to present the days discussion.

Minute 2: Presentation by KeNHA

The Expert, (Ms. Rose Oloo-Senior Sociologist) on behalf of the Project Coordinator (Engineer P. Onalo AD-Highway Design) explained that there was need to meet the stakeholders to collect and

include any concerns, innovations, ideas for benefitting the communities, as well as include any perceptions from the persons whose area of jurisdictions the project passes.

She explained the proposed Project was packaged earlier in 2014, but it requires updating. In her presentation, she covered the following areas:

Project Name: CONSTRUCTION OF KISUMU-CHEMELIL-MUHORONI -KIPSITET (C34) ROAD

Project Scope

Site clearance and top soil removal

Earthworks

For the main road;

Construction of a 175mm sub base. (Improved)

Construction of a 125mm thick DBM (Base)

Construction of a 50 mm thick

Construction of Trucks & Trailers- Chemelil

Construction of new bridges and box culverts and other drainage works.

Protection works using stone pitching and gabions, as necessary.

Relocation of services, as necessary

Provision of road furniture, including road marking and traffic signs, kerb stones and guard rails.

Landscaping including top soiling and grassing

Maintenance of works during construction

Road Design:

The road carriageway shall be 7.0m wide with shoulders of 1.5m width. The road consists of a dual carriageway for about the first 5 kilometers from Mamboleo Junction. The side ditch shall be trapezoidal with its invert level being at least 1.0m below the road formation level.

Typical Cross-section

Type II - 7.0m wide carriageway and 1.5m shoulders for the single carriageway which runs from km 5+000-60+000

Type II - 14.0m wide carriageway, 2.5m wide cycle lane and 3m wide walkway for the dual carriageway which runs from km 0+000 - 5+000. Shoulders shall be widened by 0.5m on high fills and areas on steep slopes so as to allow for installation of safety guardrails

Commercial Activities

Commercial activities in the project area include large scale sugar plantations, trade in farm produce and household goods. These small scale trade activities are concentrated at the shopping centres situated along the project road. The major centres are: Mamboleo, Miwani, Chemelil, and Muhoroni.

Benefits

Improvement of the condition of the project road will provide an alternative link to the B1 road, thus providing access to Kisumu, Kakamega, Nandi Hills, Kapsabet and Eldoret. It will also ensure timely and efficient transportation of agricultural produce and industrial products to markets.

The sociologist explained that the project planning phase was nearing completion with Updating of the Environmental Impact Assessment (EIA) and a questionnaire to capture any would be concerns would be issued out to the participants to capture the sentiments of the participants alongside the meeting discussions.

Minute 3: General concerns, Suggestions and emerging issues

The officers present gave their views and suggestion as presented in the following table;

Name	Question/comment	Answer
Joash Chirchir	Who is financing the project?	The project is financed by the GOK
	Is the road going to improve the Awasi-	No. The road will be from Kipsitet Junction,
	Chemelil road?	to Muhoroni Sugar Company to Chemilil to
		Miwani to Mamboleo Junction at Kisumu
		Kitale A1 road.
		The Awasi Chemilil section is currently under
		a PBC contract for maintenance.
Engineer Orora	The road should consider a major truck	The county to provide plans for the Industrial
	parking at Kipsitet since this is the	Park for KeNHA to consider
	proposed site for Kericho Industrial Park,	
	to ensure the road provides shared	
	benefits for Kericho county.	
	What are the safety measures for the	Class C -Type II road standard will be built
	Kipsitet to Muhoroni section given the	and maintained with all the requisite safety

	section has climbing sections where sugarcane trailers breakdown and hence cause accidents. Kipsitet Police post (now upgraded to a police station is	features.
	overwhelmed by these accidents.	
QS, L. Chepkoech	Can the project improve Kipsitet Police station, including the tarmac access to the station, which has a limited number of structures to help respond to accidents when they do happen	Noted.
DCC Ali Noor	There are social concerns around quarries since most of the material sites might be in Kericho county where projects are harvesting hard stone and murram.	Quarries will be managed to the best level to mitigate and manage any social issues.
Mrs. Leah Chirchir	Why have other projects like Kericho and Awasi Interchanges not been completed despite the long time the projects have been running?	KeNHA and the Contractor fell out and the works were suspended. Completion Works BIDS advertised in March 2020.
	Has the project considered EIAs for material sites before the extraction harms people?	The contractor will conduct the requisite NEMA approval processes for any material sites.
DCC Ali Noor	The project should consider not excacabate boundary conflicts especially Kobuta Area.	There will be further assessment to consider peace initiatives to build cohesion.
	The project should consider providing monthly stipend to residents who might be affected by any project related activities like blasting.	The project will employ the "DO NO HARM" Principle to manage the communities around sensitive sites
	How long will the road take to be completed	It will depend on the governments agreement with the contractor but may be three years
Eng. Joash	In the project description does this constitute maintenance from Kipsitet to Muhoroni? The section has continued failure even after routine repairs every six months. The section has some expansive soils.	The Materials Engineers are onsite to make sure this issue is captured and addressed.

Minute 4: AOB

The participants' on consensus agreed to provide any written comments to the project team if and when available in a week's time.

There being no other issues, the meeting was closed by the DCC with a word of confirmation that the project was welcome and it would be of great importance to the region and the country.



Meeting Photograph at Kericho County Commissioners board Room

B. NANDI COUNTY

MINUTES OF THE MEETING WITH THE NANDI COUNTY LEADERSHIP HELD AT NANDI COUNTY BOARD ROOM ON 4TH JUNE 2020

Agenda

Introduction

Awareness creation and Presentation on the project by the KeNHA expert

Representatives general concerns, suggestions, discussions and emerging issues

AOB

Participant's presents

COUNTY REPRESENTATIVES

KENHA REPRESENTATIVES (SOUTH RIFT & HEADQUARTERS)

OFFICE OF THE COUNTY COMMISSIONER

(See attached list of attendants)

Minute 1: Opening/Introduction

The meeting was called to order by CC Kutswa Olaka at 2.30PM with a welcome to all the visitors and participants. Having called for social distancing and use of Hand sanitizing for everyone, he welcomed participants to Nandi County and asked everyone to observe the rules in place for covid-19.

This was followed by a word of prayer by Dr. Francis Sang.

The CC then conducted a round of self-introductions and there after invited the KeNHA Representative to present the days discussion.

Minute 2: Presentation by KeNHA

The Expert, (Ms. Rose Oloo-Senior Sociologist) on behalf of the Project Coordinator (Engineer P. Onalo AD-Highway Design) explained that there was need to meet the stakeholders to collect and include any concerns, innovations, ideas for benefitting the communities, as well as include any perceptions from the persons whose area of jurisdictions the project passes.

She explained the proposed Project was packaged earlier in 2014, but project EIA requires updating. She introduced the project details as follows:

The project is an improvement of an existing road from Mamboleo in Kisumu in Nyanza Region, then to Chemelil via Nandi Hills in Nandi County, and exiting at Kipsitet in Kericho County.

The project will be approx. 63km long with a 5 km dual carriage section and the rest will be a single carriageway.

The project will be advertised within the year (2020) and the project is funded by Government of Kenya.

In her presentation, she covered the following areas:

Project Name: CONSTRUCTION OF KISUMU-CHEMELIL-MUHORONI –KIPSITET (C34) ROAD

Project Scope

Site clearance and top soil removal

Earthworks

For the main road:

Construction of a 175mm sub base. (Improved)

Construction of a 125mm thick DBM (Base)

Construction of a 50 mm thick AC surface

Construction of Trucks & Trailers parking at Chemelil

Construction of new bridges and box culverts and other drainage works.

Protection works using stone pitching and gabions, as necessary.

Relocation of services, as necessary

Provision of road furniture, including road marking and traffic signs, kerb stones and guard rails.

Landscaping including top soiling and grassing

Maintenance of works during construction

3. Road Design:

The road carriageway shall be 7.0m wide with shoulders of 1.5m width. The road consists of a dual carriageway for about the first 5 kilometers from Mamboleo Junction. The side ditch shall be trapezoidal with its invert level being at least 1.0m below the road formation level.

Typical Cross-section

Type II - 7.0m wide carriageway and 1.5m shoulders for the single carriageway which runs from km 5+000-60+000

Type II - 14.0m wide carriageway, 2.5m wide cycle lane and 3m wide walkway for the dual carriageway which runs from km 0+000 - 5+000. Shoulders shall be widened by 0.5m on high fills and areas on steep slopes so as to allow for installation of safety guardrails

4. Commercial Activities

Commercial activities in the project area include large scale sugar plantations, trade in farm produce and household goods. These small scale trade activities are concentrated at the shopping centres situated along the project road.

The major centres are: Mamboleo, Miwani, Chemelil, and Muhoroni with temporary structures but only few are on the right of way. As such the road is pretty free of encroachments that might require resettlement.

5. Benefits

Improvement of the condition of the project road will provide an alternative link to the B1 road, thus providing access to Kisumu, Kakamega, Nandi Hills, Kapsabet and Eldoret. It will also ensure timely and efficient transportation of agricultural produce and industrial products to markets.

The sociologist explained that the project planning phase was nearing completion with Updating of the Environmental Impact Assessment (EIA) and a questionnaire to capture any would be concerns would be issued out to the participants to capture the sentiments of the participants alongside the meeting discussions.

Minute 3: General concerns, Suggestions and emerging issues

The officers present gave their views and suggestion as presented in the following table;

Name	Question/Comment	Answer
County	Is the project re-carpeting or total	The project is total reconstruction taking into
Secretary Dr.	reconstruction? The area is in a	consideration the site soils and topography in the
Sang.	floodplain which has black cotton	area. Drainage has been considered adequately.
	soils.	
	Will the Project consider diversions	Diversions will be in place and they will be
	and how will this affect the citizens	implemented on the road reserve, and when
	currently near or using the road	detours are made on private land, negotiations
		will be made with the land owners.
		Diversions will be maintained to make sure
		communities are not adversely affected and
		safety is assured for all road users through a
		Traffic Management Plan during the
		construction period.
	Will the project employ the area	Yes. The contractor will utilize labour from the
	residents?	three counties. The project will distribute
		available job opportunities to affected counties
		through a well implemented Labour
		Management Plan.
	In terms of quality, is the road	The road is going to be a class C –Type II road
	different from the Chepterit Baraton	quality which can allow for the area traffic.
	Road	
	The road from Kondele to Mamboleo	The Works under SBI have been suspended and
	has stalled for a while, what is the	KeNHA is in the process of procuring a new
	problem?	contractor.
	The Kiboswa to Kakamega section	Noted. Appreciated.
GG 01 1	has been well done.	N 771 6 1 11 1 1 1 1 1
CC Olaka	Is the funding of the project going to	No. The funds will be secured in the
	be affected by the COVID-19	FY2020/2021 budget
	funding?	
	Currently the road is used by trailers	The road design for the proposed works has
	ferrying sugar and sugarcane	factored the loading aspect of the vehicles
	products. Is the road appropriate for such traffic?	
		There will be a greate improved innation to
	How will the road connect to Koru	There will be a grade improved junction to
	Londiani Road	connect to the project road at Muhoroni.
	Are there any concerns on	There was a shortage of Compensation funds on
	compensation like Eldoret Bypass	Eldoret Bypass but on this road, there is no
		compensation and hence there are no such
	As a side note he noted the Stand VI	challenges are anticipated.
		isa Omusalaba road was in dire need of repair as
	_	amega Kaburengu road, and Ekero Road which are
	in a bad state after the long rains.	

Engineer	The state of access roads to material	This was noted and will be undertaken jointly
Kiprop	sites should be documented before	with the county roads engineers
	and after the project	, ,
	As CSR incorporate access roads to	This was noted and any written comments on the
	market centres off the project road	proposal were welcomed.
Ag. Roads	Can the project be co-managed since	The Meeting was advised that sensitization
Director	there have been issues of contractor	would be made to the contractor and the same
Boaz	not responding to community needs	will be also be improved with a taskforce, and a
	during the life of the project. (The CC	stakeholder engagement plan will be developed
	confirmed some KeRRA contractors	in the project.
	on some projects have been difficult	
	in reaching/contacting when receiving	An emergency response system should be in
	and handling grievances from the area	place for this project.
	leadership)	
Eng. Kirwa	There has been incidences of Borrow	NEMA and the office of the County
	Pits left open after excavation in past	commissioner will come in, in addressing all
	projects	borrow Pits rehabilitation and restoration plans,
		and the project through the RE will keep
		documentation on all pits, map them on GIS,
		operational pits will be FENCED, and ponding
		at pits will be managed properly. Any losses due
		to such incidences will be managed through a
		well thought out construction ESMP that has a
		strong ESH component.
		Full time environmental safeguards experts will
		be engaged.
		The RE will be in charge of the project and any
		issue caused by the Contractor will have
CC Olaka	When I was DCC in Durati the read	financial penalties. The Contractor will be engaged on the CSR and
CC Olaka	When I was DCC in Bureti, the road project done by SBI in the area	his CSR policy will be evaluated to show his
	constructed an ICT lab and equipped	commitment to the same.
	the same. Is there CSR planned for	communent to the same.
	this project? Will CSR projects be	
	incorporated in the BIDS?	
Dr. Sang	The Chemelil Nandi Hills road has	The matter was noted and will be escalated to the
8	dangerous black spots and this should	maintenance team.
	be of great concern to KeNHA. Lives	
	have been lost almost on a daily basis	
	and the Authority should put in	
	barriers or adequate road safety and	
	vehicle control measures	
CC Olaka	The project should have a structured	This will be done.
	and meaningful engagement plan and	
	a communication strategy as well as a	
1		1

	labour management plan to ensure	
	there is no community disturbance	
	during the construction period	
Eng. Kiprop	The project should consider doing	This was noted.
	sheds along the road to promote trade	
	in the various centres it has traversed	
Dr. Sang	The County Government appreciates	The support was appreciated.
	the project, and there is no doubt the	
	project will improve the lives of the	
	people, and the road will bring great	
	economic transformation to the area.	
	He presented apologies for the	
	Governor and the Deputy Governor	
	who were in pre-planned activities.	
	The county supports National	
	Government projects, and the County	
	looks forward to partnering with	
	KeNHA in the proposed project.	

Minute 4: AOB

The County Commissioner noted that this project was going to feature in the National Development Implementation Coordination Committee where he sits, and he is happy that the Authority took time to meet the stakeholders and inform them in advance and the office looks forward to constructive engagement in the future. He noted that he was formerly an administrator in Mandera County and he wishes for the Isiolo-Wajir - Mandera which he was part of the planning committee before being transferred to Nandi County be fast tracked.

He appreciated everybody for making time and wishes the project team all the best.

The County Secretary appreciated KeNHA representatives for coming and reminded them to sign the visitor's book on their way out.

There being no other issues, the meeting ended at 5.30PM and was closed by Ms. Rose Oloo with a word of prayer.



Meeting Photograph at Nandi County Board Room

C. KISUMU COUNTY

MINUTES OF THE MEETING WITH THE KISUMU COUNTY LEADERSHIP HELD AT SUNSET HOTEL-KISUMU ON 5^{TH} JUNE 2020

Agenda

Introduction

Awareness creation and Presentation on the project by the KeNHA expert

Representatives general concerns, suggestions, discussions and emerging issues

AOB

Participants present

COUNTY REPRESENTATIVES

KENHA REPRESENTATIVES (NYANZA REGION & HEADQUARTERS)

OFFICE OF THE COUNTY COMMISSIONER

(See attached list of attendants)

Minute 1: Opening/Introduction

The meeting was called to order by Governor Peter Anyang' Nyong'o E.G.H, at 9.30AM with a welcome to all the leaders and participants. Having called for social distancing and use of masks for everyone, he welcomed participants to Kisumu County and asked everyone to observe the rules in place for management of COVID-19.

This was followed by a word of prayer by Hon. Jared Okello MP-Nyando.

The Regional KeNHA office welcomed the participants as well as DCC David Lagat on behalf of the County Commissioner.

Governor then conducted a round of self-introductions and there after invited the KeNHA Representative to present the days discussion.

Minute 2: Presentation by KeNHA

The Expert, (Ms. Rose Oloo-Senior Sociologist) on behalf of the Project Coordinator (Engineer P. Onalo AD-Highway Design) explained that there was need to meet the stakeholders to collect and include any concerns, innovations, ideas for benefitting the communities, as well as include any perceptions from the persons whose area of jurisdictions the project passes.

She explained the proposed Project was packaged earlier in 2014, but project EIA requires updating. She introduced the project details as follows:

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Commercial activities in the project area include large scale sugar plantations, trade in farm produce and household goods. These small scale trade activities are concentrated at the shopping centres situated along the project road.

The major centres are: Mamboleo, Miwani, Chemelil, and Muhoroni with temporary structures but only few are on the right of way. As such the road is pretty free of encroachments that might require resettlement.

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Improvement of the condition of the project road will provide an alternative link to the B1 road, thus providing access to Kisumu, Kakamega, Nandi Hills, Kapsabet and Eldoret. It will also ensure timely and efficient transportation of agricultural produce and industrial products to markets.

The sociologist explained that the project planning phase was nearing completion with Updating of the Environmental Impact Assessment (EIA) and a questionnaire to capture any would be concerns

would be issued out to the participants to capture the sentiments of the participants alongside the meeting discussions.

Minute 3: General concerns, Suggestions and emerging issues

The Leaders gave their views and suggestion as presented in the following table;

Name	Question	Answer
Governor Anyang'	KeNHA should develop the road as	
Nyongo	a class B road to make sure the	
	road is built to a long lasting	
	standard. The leaders know the	
	road connects different counties	
	and they know this lies in a	
	Category for Class B roads and not	
	class C roads.	
	The project should consider	
	creating a terminal for PSVs	
	coming from Kakamega and	
	Nairobi Via Londiani at Mamboleo	
	which is in line with the Kisumu	
	County Masterplan	
	The road should be developed to a	
	dual carriageway now, from	
	Mamboleo to Muhoroni now that	
	there is a project that is being	
	planned and it is at the design stage	
	and this is the Zone where	
	industrial parks and special	
	Economic Zones are planned for	
	Kisumu County	
Hon Shaker Shabbir	The leadership has fought to have	
MP Kisumu East	this road done in the last 12 years,	
	and they have pursued this road	
	since the 11 th Parliament.	
	The project budget should be in the	
	upcoming budget. Having sat in the	
	roads committee and the budget	
	committee, there was no budget as	
	yet, but a maintenance budget for	
	the first five kilometers to Ghuba	
	Bridge.	
	The leadership is a bit skeptical	

	/cautious whether the project is ready to proceed, and this project should be a joint success based on information and honesty.	
Hon Jared Okello MP	The road project should generate economic growth and there should be spur roads stemming from the project. At construction, alternative routes must be in place. In his constituency, the KeNHA Project (from Awasi to Katito) should consider providing alternative roads in his constituency.	Noted
	The Miwani- Ombeyi-Ombaka Spur road requires to be upgraded to serve the vegetable farmers; there are more than 10 health centres, several chiefs and assistant chiefs along this road.	
	Chiga –Kibos- Rabuor – Nyagade - Korowe (Approx 26km) Spur road (which was part of the roads 2000 Jubilee projects in the 11 th Parliament and has not been done to date) should be packaged as part of the project to support Maize, sugarcane, Millet and sorghum farming in the area. The condition of the road currently has caused an escalation of transportation cost.	
Hon James. O. K'Oyoo MP Muhoroni	He appreciates that this project has finally come to fruition. He expects the road to take the form taken by Mau Mau roads in central Kenya. He appreciates that this road has a history since the times of the coalition government under the Rt. Hon Raila Odinga and the first portion of Londiani Muhoroni was done. However the section from Muhoroni to Chemilil to Kisumu	Noted

	requirements of the constitution.	
Hon Olago Aluoch MP Kisumu West	The public participation is highly welcome as part of fulfilling the	Noted
Hon Olago Aluoch	part of this road. Miwani Ombeyi Ombaka Spur road should also be done. This Ombeyi Kasese road should also be done to connect to Chiga Also the spur road to Kibos prison, school for the Blind, Nubian Market and the other facilities around there. The project should also consider a serious CSR policy to reflect the needs of the people of Muhoroni. The people of Muhoroni appreciate the effort of the national government in bringing this project. The public participation is highly	Noted
	initially planned under the Londiani Muhoroni road was done without any spur roads including the Koru Spur roads and Muhoroni Town roads. Due to lack of proper infrastructure has caused so much insecurity in Muhoroni. As such, Muhoroni Songoh Road that serves Kanga Police and Songoh RDU Police Unit should be done. The neighbors to Muhoroni in Tinderet should also benefit with a spur road connecting to Chemase, and a secondary tarmacked spur road to take care of Masogo, Mbeyu, St. Boniface Catholic Diocese and other schools in Masogo. Kibigori Ombeyi road should be	

	improve the businesses along this	
	section and the entire county.	
	He proposes that the budget for the	
	additional spur roads may be	
	sourced from other sister	
	organizations to build capacity for	
	the project to meet the demand for	
	auxiliary roads. These roads will	
	help ease the tension between the	
	counties of Kisumu, Nandi and	
	·	
	Kericho which border each other.	
	He wishes the KeNHA project	
	implementation team the best and	
	noted that the spur roads being	
	presented by the leaders were key	
	to the people of Kisumu.	
MCA Miwani ward	The road project is very important	Noted
Hon. Ken.	to Miwani ward.	
	The road was repaired in the past	
	but in 2 years it was completely	
	worn out.	
	The Special Economic Zone is	
	going to be built in Miwani road.	
	Roads will be a pre-requisite for	
	operationalization of the SEZ.	
	The Miwani Ombeyi Ombaka road	
	will serve the SEZ. It should be	
	included.	
	The Kibos-Chiga Ombeyi road	
	should also be included as part of	
	the SEZ. This will help ease	
	tension in the communities where	
	the SEZ will be implemented.	
MCA Mamboleo	The showground loop road should	Noted
Ward	be considered.	
	Bolo-Gita access road will support	
	the Africities summit that will be	
	held in Kisumu City and this is	
	where hotels are coming up. This	
	should connect Obuolo Gita Ghuba	
	road to Kibos - Rabour to Chiga to	
	Obuoro to Ukweli road to A1 road	
	will open up the ward to economic	
	growth.	
	•	

	The development will improve the	
	whole Kajulu ward.	
Hon Shakir Shabbir	The project is being handled under	
MP Kisumu East	maintenance of KeRRA, and this is	
	in conflict with what KeNHA is	
	saying. The people of Kisumu want	
	the road clear on the finance and	
	policy side to avoid any further	
	delays.	
	The Gita Eseta road requires to be	
	included in the spur roads and the	
	MPs should put effort in pushing	
	the National Government to deliver	
	this Chemelil Muhoroni Road.	
Recommendations	1	

Recommendations

The Governor clarified that the legislators had already approved the reclassification of the road and moved its vesting to KeNHA from KeRRA for ease of Implementation.

He further re-iterated that the leaders should keep the positive mentality on supporting the project and he wished that the road be duallized according to the international standards without compromising the Spur roads proposed.

He noted that new major roads including bypasses should be duallized to spur regional and economic growth in the areas they traverse.

Hon. Dr. J. Nyikal	He appreciates the KeNHA team	Noted
MP, Seme	for the packaging of the project.	
	The project should factor	
	development of the region as a	
	whole, since it is a priority road, to	
	make sure it ties up developments	
	like the spur roads, the SEZ, the	
	SGR connection from Naivasha to	
	the lake region, the Sugar Industry,	
	The revamped Port of Kisumu to	
	feed into the bigger development	
	picture.	
	He appreciates the president and	
	the former prime minister for	
	considering this project. He wishes	
	KeNHA to follow up the Busia to	
	Muhuru Bay Ring road, and the	
	Rodi Kopany Sori roads for	
	development in the near future to	
	complete the picture.	
	He noted that any road without	
	spur roads is like the spine without	

	Ribs, in a human being. He	
	therefore proposed a meeting with	
	KeRRA and KURA to ensure all	
	spur roads were adopted and	
	funded and built alongside this	
	project.	
David Lagat –	This project is one among the many	Noted
Representing the	projects that adds value to the	
County	whole of the country and is in line	
Commissioner-	with all the programs being run by	
Kisumu	the National Government in the	
	region.	
	The road will improve the security	
	between Mamboleo and Muhoroni	
	and it is an important link to all the	
	police stations and administrative	
	centres along the Alignment.	
	He noted that the office of the	
	County Commissioner will support	
	the implementation of the project to	
	ensure speedy delivery for the	
	benefit of all Kenyans.	
Issack Njuguh -	The road is highly welcome from	Noted
Representing	the president, and he appreciates	
Tinderet MP &	the leadership for coming up with	
Constituency Office	the project.	
·	He notes that this road will	
	promote businesses. Alongside its	
	construction, he proposed the	
	Chemase-Upele spur road, and the	
	road to Nyasweta Primary school	
	and centre.	
	The project road will also improve	
	interactions with neighbouring	
	communities and this will	
	contribute to general peace and	
	cohesion.	
Recommendations/ si	Iggostions	

Recommendations/ suggestions

The County Government should contribute towards providing information on the proposed SEZ, Kisumu town Masterplan and other planned development initiatives to augment the implementation of the road project.

The Leaders would submit written memoranda to the KeNHA leadership for consideration in the project.

The sentiments issued by all the leaders were noted and the Authority was cognizant of the fears that the project has been mooted for a long time without being implemented. However

assurances were given that all plans were in gear to see this project commence within a reasonable timeframe.

KeNHA would provide written communication giving additional information on the project including the project cost, cost of auxiliary facilities, the commencement date, and the detailed scope once all the details had been confirmed to the leadership.

Minute 4: AOB

The Governor requested for Participants to prioritize and to make written submissions to the Director General –KeNHA to avoid bureaucratic red tape in making submissions and recommended that the project take the Mau Mau roads shape to avoid leaving out the people who are the direct beneficiaries of the project. He noted that the meeting between KeRRA and KURA would be of great essence and he would spearhead the same to bring order to the peoples desires for road projects in the Area.

There being no any other business, the meeting ended at 12.30pm by a word of prayer, and thereafter a press briefing by the governor.







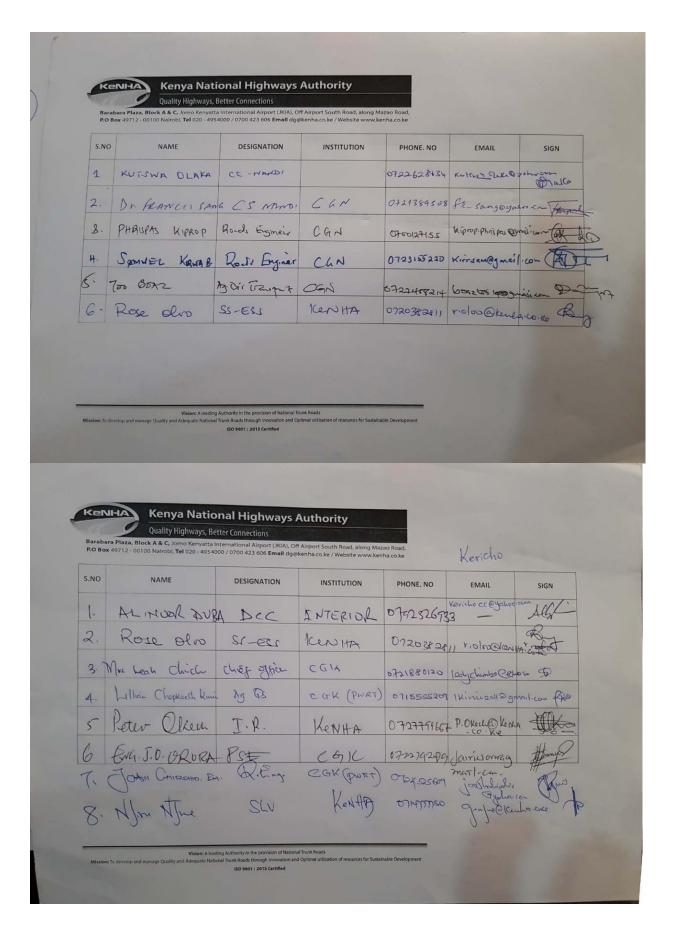
Meeting at Kisumu Sunset Hotel

KENYA NATIONAL HIGHWAYS AUTHORITY	OCTOBER 2020
Annex V: Attendance sheets	
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR TH RECONSTRUCTION TO BITUMEN STANDARDS OF MAMBOLEO-MIWANI- CHEMELII	

KIPSITET C674 (FORMERLY C34) ROAD

221 | Page

5.NO	NAME	DESIGNATION	INSTITUTION	PHONE. NO	EMAIL	SIGN
1.	ENG. H. R. JUMA	- M.D.	GOGNIRATORE CONSTRUCT	0733-6167	1) , 44, 86,	coabud. Co.
	JOSEPH ALUBA		HOMA LIME			bakah e ho
3.	ASHOW AGRAHAL	CEO.	ACEC,	0731851758	ashde agrar	(holy
4.	JOYCE OPONDO	GROVP CORPOR	CHATTHE	0707904900	long. cong	7
6.	CAROLYME RUDTI		Kisumu Concret Joodnets 11	0776848049	Cumok & you	hos. com
	JACKIM QUTA	S.A.L.J	Lenta NYANZA REGION		J. Outa @ Kenna. (a. Ke	Jambila
	NI-IA Kenya Natio	009901: 2015 Certified	of Ophinal utilization of resources for Sua	zahable Development		
Ke	m to develop and number Quality and Adequate Natio	onal Highways eter Connections international Airport (JNIA).	Authority Off Airport South Road, along 9	Aazao Road,		
Ke	Kenya Natio Quality Highways, Buara Plaza, Block A & C, Jomo Kenyata	onal Highways eter Connections international Airport (JNIA).	Authority Off Airport South Road, along 9	Aazao Road,	EMAIL	SIGN
K=	Kenya Natio Quality Highways, Bear Plaza, Block A & C. Jomo Kenyatta NAME NAME	onal Highways conal Highways etter Connections international Airport (JKIA), 200 / 0700 423 606 Email de	Authority OH Airport South Road, along (gekenha.co.ke / Website www.	Aazao Road, kenha.co.ke	g.njue@keu	L.
Barate ROB	Kenya Natio Quality Highways, Beara Plaza, Block A & C., Jomo Kenyata ox 49712 - 00100 Nairobi, Tel 020 - 4954	onal Highways brail Highways cretified Airport (JNIA), DESIGNATION	Authority Off Airport South Road, along (a) Website www.	Aazao Road, kenha.co.ke	gingue@ken o coike	L.
K=	Kenya Natio Quality Highways, Bear Plaza, Block A & C. Jomo Kenyatta NAME NAME	onal Highways onal Highways etter Connections international Airport (JNIA), 000 / 0700 423 606 Email do DESIGNATION	Authority OH Airport South Road, along (gekenha.co.ke / Website www.	PHONE. NO	g.njue@keu	L.
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S.NO	NAME	DESIGNATION	INSTITUTION	PHONE. NO	EMAIL	SIGN
1	Governor					
2.				12120	7-Whatapa	
3	Dr. J.W. NYIKAL	MP	KNA	0105123112	JWnyikas Eganoso.	ex S
A.	How They Almost	MP K. west	KWA	0722758518	olago79 Opride	14
5.	How otegs Almose Jared 014/16	mil myende	KMA	0727653594	p Ollelojend agm. 16.	n Ge
6.	Hon Janes or key	= MP Mulm	KNA.	07227780	3 Jok James e	MG
Ke	Kenya Natio Quality Highways, Base, Black & & C. John Konya H.	onal Highways a	Authority			
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Barat P.O B	Kenya Natio Quality Highways, B oara Plaza, Block A & C, Jorno Kenyata ox 49712 - 00100 Nalrobl, Tel 020 - 4954 NAME	onal Trunk Roads through innovation and ISO 9001; 2015 Certified ISO 9001; 2015 Certified Description of the	Authority If Airport South Road, along Menha.co.ke / Website www.ke	azao Road, enha.co.ke PHONE. NO	EMAIL Outliname 43 ago	
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Barat P.O B	Kenya Natio Quality Highways, B Dara Plaza, Block A & C. Jorno Kenyatta ox 49712-00100 Nairobi, Tel 020-4954 NAME Maurie Olive KSACK MSUKUH.	onal Trunk Roads through innovation and ISO 9001; 2015 Certified Donal Highways etter Connections International Airport (JKIA), Of 1000 / 0700 423 606 Email dge DESIGNATION DESIGNATION JUNEAU TIDDERELL TIDDERELL	Authority If Airport South Road, along Mokenha.co. ke / Website www.k INSTITUTION CGIL INDIRET LONGTORE	PHONE. NO 079171489	curtingum 43 ago.	AB-
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	NERRY ACHAN	CECM	CGK	072270240	5 nerry achard	egmail.com M
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	Bib Nach	CEN	PGIC	N722235	620	100
	nen: to develop and manage Quality and Adequate	A leading Authority in the provision of Na National Trunk Roads through innovation 150-9901; 2015 Certified	ational Trunk Roads on and Optimal utilization of resources fo		: a yalus. co	- A E
Barabai P.O Box	Vision: To develop and manage Quality and Adequate Menage Quality and Adequate Vision: Kenya Natio Quality Highways, B ra Plaza, Block A & C, Jomo Kenyatta 49712 - 00100 Nairobi, Tel 020 - 4954	A leading Authority in the provision of Na National Trunk Roads through innovation 150 9001 : 2015 Certified 150 9001 : 2015 Certified	ational Trunk Roads on and Optimal utilization of resources for	Sustainable Development	: a yalus. co	-A K2
Barabar P.O Box	Vision: Iden: To develop and manage Quality and Adequate Kenya Natio Quality Highways, B ra Plaza, Block A & C, Jomo Kenyatta 49712 - 00100 Nairobi, Tel 020 - 4954	A leading Authority in the provision of No Notional Trunk Roads through innovation 150 9901; 2015 Certified 150 9901; 201	ational Trunk Roads on and Optimal utilization of resources for Authority Airport South Road, along Maz, tenha.co.ke / Website www.kenl	Sustainable Development o Road, a.co.ke	EMAIL	SIGN
Barabar P.O Box	Vision: To develop and manage Quality and Adequate Menya Natic Quality Highways, B ra Plaza, Block A & C, Jomo Kenyatta 49712 - 00100 Nairobi, Tel 020 - 4954 NAME	A leading Authority in the provision of No Notional Trunk Roads through Innovation 150 9901; 2015 Certified 150 9901; 201	ational Trunk Roads on and Optimal utilization of resources for Authority Airport South Roads along Mazenha.co.ke / Website www.kenl	o Road. Ia.co.ke PHONE. NO	EMAIL CHAN	SIGN
Barabarabarabarabarabarabarabarabarabara	Vision: To develop and manage Quality and Adequate Kenya Natio Quality Highways, B ra Plaza, Block A & C, Jomo Kenyatta 49712 - 00100 Nairobi, Tel 020 - 4954 NAME NAME	A leading Authority in the provision of National Trunk Roads through innovation 180 9901; 2015 Certified 180 9901; 2015 C	ational Trunk Roads on and Optimal utilization of resources for Authority Airport South Road, along Maz, tenha.co.ke / Website www.kenl	o Road. Ia.co.ke PHONE. NO	EMAIL vits) and on the selection of	SIGN
Barabar P.O Box	Vision: To develop and manage Quality and Adequate Kenya Natic Quality Highways, B ra Plaza, Block A & C, Jomo Kenyatta 49712-00100 Nairobi, Tel 020-4954 NAME NAME Row Y Torks of CA Mala Wangae Nama	A leading Authority in the provision of National Trunk Roads through innovation 150 9001; 2015 Certified 150 9001; 2015 C	Authority Altrort South Road, along Mazenha.co.ke/Website www.kenl INSTITUTION K.C.A Lake Japan Lay K.G.K-G.PU	To Road, I.a.co.ke PHONE. NO 07208 \$1504	EMAIL vits) and on the selection of	SIGN Sign
Barabara P.O Box	Vision: To develop and manage Quality and Adequate Wenya Natic Quality Highways, B ra Plaza, Block A & C, Jomo Kenyatta 49712-00100 Nairobi, Tel 020-4954 NAME Row Y TORKS STURA Wanga Nanus Juma Kanus Juma	A leading Authority in the provision of National Trunk Roads through innovation 180 9901; 2015 Certified 180 9901; 2015 C	Authority Alrent South Road, along Maz Renha Co. ke / Website www.kenl INSTITUTION Kr C. A Lake Prev. Co. y Lake Prev. Co. y	50stanable Development 10 Road. 10 Roa	EMAIL Vitalous on esselous og i linemanujcking q-njue@llouhe	SIGN Sign
Renabase Pro Box	Vision: Vision	A leading Authority in the provision of National Trunk Roads through innovation 150 9901; 2015 Certified 150 9901; 2015 C	Authority Altrort South Road, along Mazenha.co.ke/Website www.kenl INSTITUTION K.C.A Lake Japan Lay K.G.K-G.PU	OROSCI. 10. ROSCI. 10.	EMAIL Vits Some of the some of the sound of	SIGN Sign

S.NO	ox 49712 - 00100 Nairobi, Tel 020 - 4954	DESIGNATION		PHONE. NO	EMAIL	SIGN
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	Robert Demo	Chair KARA	Kajulu Residents Association	0704370592	owinor@ yahar com	8
	marice origin	SCA	CON	0718031872	onche mau	1 1000
	Wasama Nancy M	MUNAMONT	CGIL	0177538553	Warama. nahou	1 (laly
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	Hon Shakeel Strak	De KSM East	KISUM East	0722 801717	shakeelghelds ahmed a guent. um	8

KIPSITET C674 (FORMERLY C34) ROAD

APPENDIX 3: COMPLAINTS REGISTRATION FORM

R	EFERENCE					
ECTION A You are filling in this form becau	se you want the O	rganization R	Responsible to	look at you	ır compla	int.
Phone us on+254 i	f you need help to	complete the	form.			
'ell us about yourself:						
urname					Title	
irst name(s)						
Occupation						
dentity Number:						
Address to which we m						
Address			Tel			
			E-mail			
5.11 Details of anyone compl	laining with you					
urname						
First name(s)					Title	
Occupation						
dentity Number						
Address to which we may send your letter						
Address			Telephone			
			E-mail			
6.11 SECTION B						
Details of the person against who	m you are compla	ining:				

or company		
Their address		
Then address		
Phone number	Fax	
SECTION C	1 dx	
Please tell us what your con	nplaint is about:	
First, tell us in just a few wor	rds what your complaint is about and then give us the background.	
Remember		
We do not know anything a	about your complaint so please give us all the details.	
_	one calls, meetings, or letters you have received or exchanged w If you have letters, please enclose them.	vith the person against
whom you are complaining.	n you have letters, please enclose them.	
SECTION D		
How would you like your co	omplaint to be resolved? (Outcome expected)	
Your permission for us to g	o ahead:	
I would like the Organization	responsible to investigate my complaint.	
	zation receiving my Complaint or his/her staff may need to excharge a vant organizations (for example to find out important information a	nge information about
		about my case).
May publish examples of what keep my personal information	here things can go wrong, based on real cases but will always re	
	here things can go wrong, based on real cases but will always re n confidential. Date	
keep my personal information Signature	here things can go wrong, based on real cases but will always ren confidential. Date Date Date	

PLEASE POST THIS FORM TO:

included everything you want to tell us about your complaint?
enclosed a copy of the company's final response letter?enclosed copies of relevant documents?
Fax:
Email:
Website:
y

DATE RECEIVED	
FILE NUMBER	
CAPTURED BY	
OFFICIAL RESPONSIBLE	

APPENDIX 4: GRIEVANCE RESOLUTION FORM

Rev 1: .			
RESOI	LUTION FOR	M	
Review/Resolution			
Date of Conciliation Session:			
Was Filer Present?	Yes	No	
Was field verification of complaint conducted?		No	
, as note termenton of complaint conductor.	100	1,0	
Findings of field investigation:			
Summary of Conciliation Session Discussion:			
Summing of Concession Substitution			
Agreements			
Was agreement reached on the issues?			
Key Issue	v	es/No Remarks	
Key issue	1	es/110 Remarks	
A 1392 1 A A D-4-21-			
Additional Agreement Details			
If agreement was not reached, specify the points	of disagreeme	ent below:	
Signed (Conciliator):		_ Signed (Filer):	
_		_	
Signed:			
Independent Observer			
Date:			

APPENDIX 5: QUESTIONNAIRES



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT

The Government of Kenya has carmarked funds through the Development Vote to rehabilitate the Kisumu-Chemeili- Muhoroni Road. The proposed 62.0 kilometer (km) two lane road, starting from Kisumu Mamboleo junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Miwani Jua Kali, Chemase Chepserta, Chemeili, Oseng, Muhoroni junction and Bangla junction linking the proposed C34 road to B1 at km 62.

According to Environmental Management and Coordination Act, Cap 387, public consultation is vital to effective management of environmental and social impacts associated with projects. KeNHA therefore humbly request for your views and concerns as regards to the proposed project.

Please note that your name and information therein will <u>ONLY</u> be used for the stated purpose in this particular project.

NA	AME CHIRMID IDNO: DATIESTY	
00	cupation: TOAPS ENGINEECompany/Organization: COUNTY	
	No: 0724525609 Location/Area or residence REPICHON	1
1.	Are you aware of this project? (Tick one) Yes [JNo[] Do you believe this project will be of any benefit to your area Yes [JNo[]	
3.	Please tell us pow this project will benefit you and the community (FAIDA) The Ware Care S See un 104 August 104 The Care S	
4.	What are the property issues related to the control state of the road? Starting to the road? Salay Sugarel	

1

The solution	struction and operation	to	705/Fia	U of one	met
	08.			2-2-4-40	_
How would y	ou like the negative	impagts associat	CONDA HAY	be addressed?	100
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		0	itution/association to		ne
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** <u>***********************************</u>					
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For more information please contact us at $\pm 254-020-801342$. Thank you for your cooperation



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

The Government of Kenya has carmarked funds through the Development Vote to rehabilitate the Kisumu-Chemetii- Muhoroni Road. The proposed 62.0 kilometer (km) two lane road, starting from Kisumu Mamboleo junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Miwani Jua Kali, Chemase Chepserta, Chemetii, Oseng, Muhoroni junction and Bangla junction linking the proposed C34 road to B1 at km 62.

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Please note that your name and information therein will ONLY be used for the stated purpose in

NAME PROTUS ON USA GAD No:

Occupation:

Tel No:

Occupation:

Company/Organization:

Tel No:

Occupation:

Company/Organization:

Tel No:

Occupation:

Company/Organization:

Aftholise of Kambag

1. Are you aware of this project? (Tick one)

Yes UNo[]

2. Do you believe this project will be of any benefit to your area Yes [] No[]

3. Please tell us how this project will benefit you and the community

Thomas of the problems/issues related to the current state of the road?

- Uness dul

- Apenine for Road year - Tourport

1

5. What are the negative impacts (either environmental or socio*economic) that could result from the construction and operation of the road?

The negative issues on normal construction

6. How would you like the negative impacts associated with the project to be addressed?

- Contractor Areas

7. How would you like the local community/institution/association to be involved in the project?

- Feeder Roads - 5 xo - 2 xo - Hayhorego - Cambrigo Koringa - Kibos, Waythorego - Stage - Klaythorego mitg Legio Mana, Alango Pry School to Gari Catholic to Rayman 8. Any other comments/proposals/ concerns about the road project?

- Any other commental proposal of concerns about the read project!

- Alabe XII have - Concuete feeder Roads - Quany Roads - Alabe Dressian - Asgra sec se Albert school - Ren Access road - Rabray live:

* Opportunity to Supply - Locally available Materials
For more information piesse contact us at +254-020-801342. Thank you for your
cooperation Devide on Opportunity for 2007 local

Purchasing programme-Provide to call with Employment in each Mage where the road passes.

2



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

The Government of Kenya has earmarked funds through the Development Vote to rehabilitate the Kisumu-Chemetii- Muhoroni Road. The proposed 62.0 kilometer (km) two lane road, starting from Kisumu Mamboleo junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Mivani Jua Kali, Chemase Chepserta, Chemetii, Oseng, Muhoroni junction and Bangla junction linking the proposed C34 road to B1 at km 62.

According to Environmental Management and Coordination Act, Cap 387, public consultation is vital to effective management of environmental and social impacts associated with projects. KeNHA therefore humbly request for your views and concerns as regards to the proposed projects.

Please note that your name and information therein will ONLY be used for the stated purpose
this particular project.
NAME Thirty Guyango ID No:
Occupation:Company/Organization:Company/Organization:
Tel No: 070450803 Location/Area of residence Washings
1. Are you aware of this project? (Tick one) Yes [/No[]
2. Do you believe this project will be of any benefit to your area Yes. [] No []
3. Please tell us how this project will benefit you and the community
- Improved business
4. What are the problems/issues related to the current state of the road?
- Pottades
- Damage 87 bive parts - bearings
- Mouthly

5. What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?

- Accidents - Durt

6. How would you like the negative impacts associated with the project to be addressed?

- Provide Bumps

7. How would you like the local community/institution/association to be involved in the project?

- Provide employment to locals

8. Any other comments/proposals/ concerns about the road project?

- Improve Kotunga Dispensary Access
- Kenya Rosearch Dispensary Access.

For more information please contact us at +254-020-801342. Thank you for your cooperation

2



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

The Government of Kenya has carmarked funds through the Development Vote to rehabilitate the Kisumu-Chemetii- Muhoroni Road. The proposed 62.0 kilometer (km) two lane road, starting from Kisumu Mamboleo junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Miwani Jua Kali, Chemase Chepserta, Chemelli, Oseng, Muhoroni junction and Bangia junction linking the proposed C34 road to B1 at km 62.

According to Environmental Management and Coordination Act, Cap 387, public consultation is vital to effective management of environmental and social impacts associated with projects. KeNHA therefore humbly request for your views and concerns as regards to the proposed project.

Please note that your name and information therein will <u>ONLY</u> be used for the stated purpose in this particular project.

NAME EVAC OTTENDIDNO:	
Occupation:Company/Organization:	
To No: 0725366093 Location/Area of residence Washing	>
1. Are you aware of this project? (Tick one) 2. Do you believe this project will be of any benefit to your area Yes [No []	
3. Please tell us how this project will benefit you and the community. — Improve Trade	
4. What are the problems/issues related to the current state of the road?	

1

- 6. How would you like the negative impacts associated with the project to be addressed?
- 7. How would you like the local community/institution/association to be involved in the project?
- 8. Any other comments/proposals/ concerns about the road project?

 TWYOUR L'ONDING.

For more information please contact us at +254-020-801342. Thank you for your cooperation



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

The Government of Kenya has carmarked funds through the Development Vote to rehabilitate the Kisumu-Chemeiii- Muhoroni Road. The proposed 62.0 kilometer (km) two lane road, starting from Kisumu Mamboleo junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Miwani Jua Kali, Chemase Chepserta, Chemeili, Oseng, Muhoroni junction and Bangia junction linking the proposed C34 road to B1 at km 62.

According to Environmental Management and Coordination Act, Cap 387, public consultation is vital to effective management of environmental and social impacts associated with projects. KeNHA therefore humbly request for your views and concerns as regards to the proposed project.

Please note that your name and information therein will <u>ONLY</u> be used for the stated purpose in this particular project.

NAME TALIA (HAEMSAID No:
Occupation:Company/Organization:
Tel No: 0720719395 Location/Area of residence GHUBA
1. Are you aware of this project? (Tick one) Yes [No[]
2. Do you believe this project will be of any benefit to your area Yes// No[]
3. Please tell us now this project will benefit you and the community at for school - the set transport (currently har to legiuming the start and the sound to be avoided due to but and addition of road and to be reduced
4. What are the problems issues related to the current state of the road?
- Velwide breakdown Late to work. - High faves for commuters

1

5. What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?

-Sheeding.
- Children crossing
- Traders rolugn transport trucke to
manage their vehicles

6. How would you like the negative impacts associated with the project to be addressed?

- Limit Speeds - @ Zion Schools + nursery Schools. - Train boda bodas on Speeding.

7. How would you like the local community/institution/association to be involved in the project?

- Day Wells the salantes

8. Any other comments/proposals/ concerns about the road project?

- Provide Market State @ Ghuba.

For more information please contact us at +254-020-801342. Thank you for your cooperation

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QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

The Government of Kenya has earmarked funds through the Development Vote to rehabilitate the Kisumu-Chemeili- Muhoroni Road. The proposed 62.0 kilometer (km) two lane road, starting from Kisumu Mamboleo junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Miwani Jua Kaii, Chemase Chepserta, Chemeili, Oseng, Muhoroni junction and Bangia junction linking the proposed C34 road to B1 at km 62.

According to Environmental Management and Coordination Act, Cap 387, public consultation is vital to effective management of environmental and social impacts associated with projects. KeNHA therefore humbly request for your views and concerns as regards to the proposed project.

Please note that your name and information therein will ONLY be used for the stated purpose in this particular project.

NAME DAMES DROTH IDAL

0	ecupation: TRANSPORT Company/Organization: NAMED TO ROUTE 1
1.	Are you aware of this project? (Tick one) Yes [[No []]
2.	Do you believe this project will be of any benefit to your area Yes [] No []
3.	Please tell us how this project will benefit you and the community
	- It will minimise cost of repairs
4,	What are the problems issues related to the current state of the road?
4,	What are the problems/issues related to the current state of the road? Potholes Stappaled

1

5. What are the negative impacts (either environmental or socia-economic) that could result from the construction and operation of the road?

- Directions Quality

6. How would you like the negative impacts associated with the project to be addressed?

- Maintain Diversions fully

7. How would you like the local community/institution/association to be involved in the project?

- Provide Information in advance on

8. Any other comments/proposals/ concerns about the road project?

- The project to commence quickly.

For more information please contact us at +254-020-801342. Thank you for your cooperation

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QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

The Government of Kenya has carmarked funds through the Development Vote to renabilitate the Kisumu-Chemetii- Muhoroni Road. The proposed 62.0 kilometer (km) two tane road, starting from Kisumu Mamboleo junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Miwani Jua Kali, Chemase Chopserta, Chemeili, Oseng, Muhoroni junction and Bangla junction linking the proposed C34 road to B1 at km 62.

According to Environmental Management and Coordination Act, Cap 387, public consultation is vital to effective management of environmental and social impacts associated with projects. KoNHA therefore numbly request for your views and concerns as regards to the proposed project.

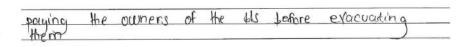
Please note that your name and information therein will <u>ONLY</u> be used for the stated purpose in this particular project.

NAMEWALTER	AUMA.	IDNo: 136046	313	
Occupation: TRADE	ρ.	Company/Organization	" BUTCHERY	
To No: 0722443	885 _Locat	ion/Area of residence	MAMBOLEO .	
	project, will be a	one) Yes [] We f any benefit to your arenefit you and the com	rea Yes[]	
Burnesa Good 1	ocid trans	port		
4. What are the proble	ems/issues related	I to the current state of	the road?	
Air po	Ilution.	us flu		

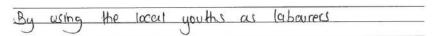
5.	What are the negative impacts (either environmental or socio*economic) that could re-	esult
	from the construction and operation of the road?	

Eyelcuation	of	businers	people.	





7. How would you like the local community/institution/association to be involved in the project?



8. Any other comments/proposals/ concerns about the road project?

For more information please contact us at +254-020-801342. Thank you for your cooperation

2



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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Please note that your name and Information therein will <u>ONLY</u> be used for the stated purpose in this particular project.

N/	AME Arnold Ame Bode IDNo: 39103339
0.	company/Organization:
Te	No: 670337700 & Location/Area of residence Mambaleo
1.	Are you aware of this project? (Tick one) Yes 1/10[]
2.	Do you believe this project will be of any benefit to your area Yes [] No []
3.	Please tell us how this project will benefit you and the community
	There will be a good access to the entire area
4.	What are the problems/issues related to the current state of the road? - Accurate to the bad state of the pad
	- spelling of Vehicles - Air pollution due to douts

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cooperation

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				20 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	evaruatiba	
project?	qiving				revidents	
Any other co	mments/pr	oposals/ co	ncerns about	the road proje	pport the	

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For more information please contact us at +254-020-801342. Thank you for your



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

The Government of Kenya has earmarked funds through the Development Vote to rehabilitate the Kisumu-Chemetii- Muhoroni Road. The proposed 62.0 kilometer (km) two lane road, starting from Kisumu Mamboleo Junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Miwani Jua Kali, Chemase Chepserta, Chemelli, Oseng, Muhoroni junction and Bangia junction linking the proposed C34 road to B1 at km 62.

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Please note that your name and information therein will \underline{ONLY} be used for the stated purpose in this particular project.

NAME ATEX COTANGO ID No. 20078/10
Occupation: BUSINEISMAN Company/Organization: MANBOLED TRADELS ASSOCIATION
Tel No. 0129 038686 Location/Area of residence MAMBOLEO
1 A 2/T \ \/\(\)
Are you aware of this project? (Tick one) Vs []No[] Do you believe this project will be of any benefit to your area. Ys[]No[]
Z. Uo you believe this project will be of any benefit to your area Y/s [] No []
3. Please tell us how this project will benefit you and the community
- ENHANCE TRADE BETWEEN THE COMMUNITY AND NEIGHBOUGH LOUNTY
SINCE CHEAD AND QUICK TRANSPORT SHALL BE ENARCEA BY GODD AD 100
HOAD, SHALL ALGO UPLIFF HEALTH STATUS SINCE MEANS OF PRANCON-
STATE BE FASIER, STALL ALSO IMPROVE SOLURIT SCATUS WIRHTH AND ALON
THE COMMUNIST SINCE PARKET MOTORS SHALL BE MOVING FREQUENCLY AND
PRICER.
4. What are the problems/issues related to the current state of the road?
- TRANSPORTATION COST IS HIGH DIE TO PENSER VEHICLES PLYING THE COAD,
- COST OF BUSINESS IS HIGH FORDWING HIGH PRANSPORTATION (657.
- DIRECULTY IN ACCESSING HEALTH PAGINTIES FIRSTER -

1

- 5. What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?

 BISECATION OF BUSINESS PREMISES LEADING TO LOSE OF TOB ESPORTUDITY TO COME MEMBERS.

 HEARTH PASK DUE TO DUST BURING PHE CONTROCTION DEMOD
- 6. How would you like the negative impacts associated with the project to be addressed?
- PLACE TO CONTIDUE WITH THEIR DAMES BUSINESSES.

 ALWAYS WATER DUST DIVERSION DOADS TO REDUCE DUSTS DUFFIT.

 THE KORKING PERIODS
- 7. How would you like the local community/institution/association to be involved in the
- THE LOCALS BE STREET EMPLOYMENT OPPORTONITY IF ANY.
 WORK TOGETHER WITH BELBHADT INSTITUTIONS ASSECTATIONS TO
 ENHANCE PUBLIC PARTICIPATION.
- 8. Any other comments/proposate/ concerns about the road project?

 NOTEKMANNEHTP PHAT CAN BE DONE BY THE COMMUNITY MEMBERS
 SHOULD BE GIVEN TO MAKE THEM FEEL PART AND PARCEL OF THE PROJECT
 TRADERS AFFECTED TO BE RELOCATED TO THE MARKET OF MAMBERED AND
 GIVEN ALLOCATED SPACES SINCE THE MARKET IS SPACEU.

For more information please contact us at +254-020-801342. Thank you for your cooperation

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QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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his p	E TOTAL SHOWST A ID No: 2291208 Destion: SAFERFLAGS (WELDER) Company/Organization: MAMROTES TRADERS ASSOCIATION
1AN	DNo: DEGILES (WELLES) Company/Organization: MAMILERO TRADERS ASSOCIATION
	o: 0729636486 Location/Area of residence MANRO LEO
61 1	o. Distriction of testing of test
. A	re you aware of this project? (Tick one) Yes [MNo[]
. D	o you believe this project will be of any benefit to your area Yes [M] No []
. P	ease tell us how this project will benefit you and the community
	THE MOTECT WILL INCREASE LEAVING STYLE OF THE
	COMMUNITY BY CREATING MORE JOBS THOS UPLEFING
	BUSGINES CAPACITY!
1.0	7
. V	That are the problems issues related to the current state of the road? DHAW POOR CAMMONICATION THRONGIT THANSPORT
	(2) LOW INCOME DUE TO LOW BUSTNESS CAPACITY
	B) MORE INFECTIONS OF AMBORN BISEASES.

1

6. How would you like the negative impacts associated with the project to be addressed?

NOTICES SHOULD BE ISSUE FAMER TO ALLOW.

THE AFFECTED TO HAVE FROM THE ROLLING.

5. What are the negative impacts (either environmental or socio-economic) that could result

- 7. How would you like the local community/institution/association to be involved in the project?

 THROUGH PURLIC PARTICIPATION, AHL ALSO GIVEN

 OPOTUNITY TO SERS THE THEI CAN LO-
- 8. Any other comments/proposals/ concerns about the road project?

 THANKS TO THE NATIONAL CONENTREDIT AND TO THE PRESIDENT OF PENUTY OF VENTA FOR THE BIG PROSECT TO KISSIAN COUNTY.

For more information please contact us at +254-020-801342. Thank you for your cooperation

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QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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Please note that your name and information therein will ONLY be used for the stated purpose in this particular project.

NAME MARITIA ANUJA OREILA ID No: 23302038	
Occupation: TAINQING Company/Organization:	
Tel No. 074 483758 Location/Area of residence MAMBOLEO	
1. Are you aware of this project? (Tick one) \(\sigma_s \) [] No []	
2. Do you believe this project will be of any benefit to your area (No []	
3. Please tell us how this project will benefit you and the community .	
It will promote and boost our business	
H WILL BE OFFICEHOLD	1 20
It will made trasportation easier	
The will meete many for the form	
7 W	
4. What are the problems issues related to the current state of the road!	
The grea is very clusty,	
The Mosportation is very back	
3	

cooperation

5.	What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?
	It will appeal out business The area will so dusty and This may result of sickness
6.	How would you like the negative impacts associated with the project to be addressed? If will not be poster got us to work as aresure.
	How would you like the negative impacts associated with the project to be addressed? If will not be paster got us to work as aresured to be usual like to be allocated to obetter place.
7.	How would you like the local community/institution/association to be involved in the project? We would like any young boys to work with people who will writing in the load. This will promite Jobs for any people
8.	Any other comments/proposals/ concerns about the road project? The construction to be done as quick as possible If he will be easier to use within the area
Fc	or more information please contact us at +254-020-801342. Thank you for your



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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AME Lilicin Okoth ID No; 10972855 Coupation: Teacher Company/Organization: UTTC of No: 0721227227 Location/Area of residence Mambales	_
Are you aware of this project? (Tick one) Yes YNo [] Do you believe this project will be of any benefit to your area. Yes YNo [] Please tell us how this project will benefit you and the community.	
Good road acress and expansion of bussine	lle s
What are the problems/issues related to the current state of the road?	
Sickness such as coughs caused by clust parti	cles

1

-	Sentru	ction	- 01	f bus	wines	prem	ises			
. How	would you	like the	negativo	e Impacts	s assoc	iated with	the projec	at to be	addressee	. ?
B	y pay	ing	the	busir	ress	owner	s bel	fore	rvaca	ucitin
. Ном	v would ye	ou like t	he loca	M comm	unity/i	nstitution/s	issociatio	n to t	oe involve	ed in t
	By e	mploy	ing	the	loce	il you	ths o	iis la	abourer	<u></u>
-	Soon	Uppor		he		the road p		th	e focus	das

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cooperation



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supation:	TRAI	EL	Com	pany/Or	ganization	: WE	ZDIN G	m	ARILE
Do you t	pelieve this	project will	I be of any	benefit	to your an	ea Yes [/		cNC	У
	The	road	is in	np ass	ible	and	her	d	ti
	Are you Do you Please to	Are you aware of the Do you believe this Please tell us how the EASEA	Supation: TRADER No: 072186683'8 Are you aware of this project? Do you believe this project will Please tell us how this project will provide the problems issues of the road	Supstion: TRADER Com No: 072126683'8 Location// Are you aware of this project? (Tick one) Do you believe this project will be of any Please tell us how this project will benefit FASEN TRANSPER What are the problems/issues related to the conditions of the conditio	Supstion: TRADER Company/On No: 0721266838 Location/Area of re No: 0721266838 Location/Area of re Are you aware of this project? (Tick one) Please tell us how this project will be of any benefit you and EASEN TRANSPERTATION What are the problems/issues related to the current the road is umpass	Supetion: TRADER Company/Organization No: 074866838 Location/Area of residence. Are you aware of this project? (Tick one) Yes MNo. Do you believe this project will be of any benefit to your and Please tell us how this project will benefit you and the commerce of the SEN TRANSPORTATION. What are the problems issues related to the current state of the company of the road is any 985161e.	Supstion: TRADEA Company/Organization: WENo: 072126683'8 Location/Area of residence MAMI Are you aware of this project? (Tick one) Yes MNo[] Do you believe this project will be of any benefit to your area Yes Market Service Transport of the community FASEN TRANSPORTATION JEF	Supstion: TRADER Company/Organization: WELDING No: 074866838 Location/Area of residence MAMBOLED Are you aware of this project? (Tick one) Yes MNO[] Do you believe this project will be of any benefit to your area Yes MNO[] Please tell us how this project will benefit you and the community EASEN TRANSPERTATION JEFFICE. What are the problems/issues related to the current state of the road? The road is impassible and her	Superlion: TRADER Company/Organization: WELDING No: 074866838 Location/Area of residence MAMBOLED MA Are you aware of this project? (Tick one) Yes MNo[] Do you believe this project will be of any benefit to your area Yes MNo[] Please tell us how this project will benefit you and the community EASEN TRANSPERTATION & EFFICEING What are the problems/issues related to the current state of the road? The road is up assible and herd

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Н				Impacts ass	and the best of the	. The three more in	cat to be	adeleann	?	
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-	Cont	vol.	57	Traff	ric	in ?	95	od a	5ay	
_	Shall	plon	the	5045	6 0	rued 1	ras	400	erd la	bou
		,		10)			
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-										
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How .	would y	ou like	the local	community	y/instituti	ion/associat	ion to I	oe inval	ved in the	
How of	0									
	0									7
	0			communiti						7
	0									7
	0									7
project	? Ge	et e	emp	loyme	en 4	wh				7
project	? Ga	ments/pr	em p		en 4	wh	ire	nes	cussen	

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00	cupation: Scion \$ beautist Company/Organization: 1 No: 07/7372550 Location/Area of residence Manage Co.
	Are you aware of this project? (Tick one) Yes []No[] Do you believe this project will be of any benefit to your area Yes [] No[] Please tell us how this project will benefit you and the community
	It will benegit air Community in good transportation of bussines in our Community
4.	Problems of the Commit State of the road? Problems of the Commit State of the road? H Will make us loose as jobs because our business was taking place to the sides of the road is that

5.	What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?
	Good hansportation of groods development of the four growth of prisings Simply because of the good mad that we will have.
6.	How would you like the negative impacts associated with the project to be addressed?
	twould like the negative impacts assiciated with the project to be addressed by the 10 the government templying youths and those who will bose their job after the construction so that they can have something to do

Community to keep the	om busy' and make then
	MILLO
	0

7. How would you like the local community/institution/association to be involved in the

For more information please contact us at +254-020-801342. Thank you for your cooperation

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QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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NAME Mases Palougi IDNo: 23828589
Occupation: M-PESA Company/Organization:
Tel No: 0727407168 Location/Area of residence Couper
1. Are you aware of this project? (Tick one) Yes []No[]
2. Do you believe this project will be of any benefit to your area Yes [] No []
3. Ptease tell us how this project will benefit you and the community
Once completed the one of along the road will
Once completed the areas along the road will improve Claronizedly to some extend as their will be good good for that Supports free you of goods and structs
good good by that Sweath free flow of made and Strike
O STATE OF THE STA
4 W/
4. What are the problems issues related to the current state of the road?
On rang sersons the is issuify road losts band
It has many post holes windowny the movement of Vehicles

- 5. What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?

 Some business Structures along the road will be demolished that might lend to loss amon to business owners famers along that with lands along the road will be affected dosons some partial of their land will be accepted during Construction
- 6. How would you like the negative impacts associated with the project to be addressed?

 Durings owners to be rellocated to ruen duce of governote expenses

 formers to be for the portion of their lands that will be occupied
- 7. How would you like the local community/institution/association to be involved in the project?

 During (onthorism Community members to be employed)

 8. Any other comments/proposals/ concerns about the road project?

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00	ME SUT SUNICE ALVOCHID No: 28595978. Coupation: Beginner Lady. Company/Organization: = 1301+ omployer. No: 0706830516. Location/Area or residence Manualec.
2.	Are you aware of this project? (Tick one) Do you believe this project will be of any benefit to your area Yes MNo[] Please tell us now this project will benefit you and the community It will provide whortcut to the recidence from specific the project will me common the joblest people with wark I have project will me common the joblest people with wark the project will be project will help the environment to be need to the transmitter.
4.	What are the problems/issues related to the current state of the road? *The current xood current state of the road? *The current rape of roat without for feet and accurate thicking from place to place.

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5. What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road? The helping is sprion will be cledleyed:

6. How would you like the negative impacts associated with the project to be addressed?

* As por me, I would like to address the government to construct the rad for Guitable transportation of good and propor.

7. How would you like the local community/institution/association to be involved in the project?

Along those should help to traine and report the appointment in contraction.

8. Any other comments/proposally concerns about the rose project?

** To the concerned people who he whom will be holp in the concerned people who he whom will be holp in the concerned people who he whom will be to it in the month that will be done.

For more information please contact us at +254-020-801342. Thank you for your cooperation

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NΑ	AME GEORGE POLICIAN DENDING: 25089361
00	Company/Organization: 5HDF BARRY & USER
Tel	No: 0769173746 Location/Area of residence MAMBULEV MIN.
1.	Are you aware of this project? (Tick one)
2.	Do you believe this project will be of any benefit to your area Yest No []
3.	THE WILL MENTE MEMBELL & 24 N ECOMOMIA GOW
	12P. It will I pust transport tes too the
	manifoted Residents. We as business Right
	The Property.
4	What are the problems/issues related to the current state of the road?
**	Transport to short of
	It makes business second down.
	CAT TIMEN SHOWING SALVING CLOSE

1

	1 THINK BOLERMENT SHOULD KNOW
	THE PROPRE OF THEOR REGIONS WIND BE AFFECTED
	- NO BE GIVEN THE KINE PROPERTY DOLLE SOFT OR
6	How would you like the negative impacts associated with the project to be addressed?
٥.	FRE DF ALL YOU (HOURD SET & PLAIE FOR
	THE AFFECTED TRADERS. I MEAN WE SHOULD BE
	TOLD WHERE TO MILIRATIE TO, SURING THIS PROCESS.
	THROUGH HELPING TRADERO IN MAMBULED.
7.	How would you like the local community/institution/association to be involved in the
	BY ALLOWING THE PROJECT TO PROJECT EDZLT
	INTIMINIT INTEFRINU WITH THE PROCES.
	GINE THE TRADERS. EARLY LOARNING MOTICE
	DY AGRETICA TWO MONTHS FOR PARKING.

5. What are the negative impacts (either environmental or socio*economic) that could result

from the construction and operation of the road?

For more information please contact us at $\pm 254-020-801342$. Thank you for your cooperation

8. Any other comments/proposals/ concerns about the road project?

DN THE PODJET LET US BE GIVEN 4005 TIME
TO SETTLE BEFORE EVILTION AND LET THE GOVE

INVOLVE TRADERS KARLY ENDUH.

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NAMEDITATION AND IDNO: 401004
Occupation: BUSINECS Company/Organization: 500
Tel No. 0 70 153 GBB - Location/Area of residence MAMBOLLO
Are you aware of this project? (Tick one) Yes []No[] Do you believe this project will be of any benefit to your area Yes [] No[]
2. Do you believe this project will be of any benefit to your area Yes [] No []
2 D
- U will be an easy access to faquibole
when the project is done perfectly
- Ut make buy movement to town eater of
this will make our business prosper!
4. What are the problems issues related to the current state of the road?
4. What are the problems issues related to the current state of the road?
the potenties:
- it is dusty of this makes is get diseased the hora
(= 49 h.
- Isules are that bussiness men are along The
- Isules are that bussiness men are along the side of the stad of this will affect the
Side of the Day of this will affect the
1

5.	What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?
	- the negative impact on environmental is that
	it will be dusty when the construction will be
	De are works along the road.
	we are worths along the road.

).	How would you like the negative impacts associated with the project to be addressed?
-	Ne would want the confractors to soray
	Water for the dust when the construction
	work of ou.

7.	How would you I	ike the loca	community/ir	nstitution/ass	ociation to be	involved in the
	project?	co e	should	soe	que	achetal
	labour					
				1 1		





QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT

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. 1	How would you	like the	e local co	ornmur	nity/institution/ass	sociation t	o be in	volved in the
J	project?	Ce Ki	Kum	10	Go-operate	NIK	the	Contractors



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QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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you aware	0.77	,	Yes [No[] It to your area Yes [No[]
ou believe se tell us h	this project will be ow this project will	of any benefit benefit you a	it to your area Yes∜]No[] nd the community
Canal	buriness	an nort on i	Lies
Good	transport	opport or m	(16.3
	'		
are the p	roblems/issues relat	ed to the curre	ont state of the road?
	inte		
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Accide Flu Conger			

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-	icuarion	of	business	people.	
How wou	ld you like the	e negativo	impacts associ	iated with the project	to be addressed?
h .			. 1.6		
Paying	business	peor	ole betone	evacuating	them
How wo	uld vou like	the loca	I community/i	nstitution/association	to be involved in
	uld you like	the loca	I community/ii	nstitution/association	to be involved in
oroject?					
project?				association	

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QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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cupa	ILENETH OCUPUT ID No: 309/25/8 ation: HyS/LED Company/Organization: NA 10719 380149 Location/Area of residence MAMBOLEU
Are Do	you aware of this project? (Tick one) Yes [] No [] you believe this project will be of any benefit to your area Yes [] No [] ase tell us how this project will benefit you and the community BAST ACCESIBILITY
Wn	nat are the problems/issues related to the current state of the road?
	VERT POOR

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5. What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?

6. How would you like the negative impacts associated with the project to be addressed?

before

7. How would you like the local community/institution/association to be involved in the

Construction would great

For more information please contact us at +254-020-801342. Thank you for your cooperation



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duc of 1 1011 01877/92

NAME JOGO OMICHO IDNO: 236-161
Occupation:
Tel No: 07255 Docation/Area of residence Mambale o
1. Are you aware of this project? (Tick one)
2. Do you believe this project will be of any benefit to your area Yes [] No []
3 Planes tell us how this project will benefit you and the community
dood harmstructure the to fast and I conveyment transport services.
4. What are the problems/issues related to the current state of the road? Leads to poor lufrus fructure and love Nears of transportation.

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	from the construction and operation of the road?
	- Trang the time of construction It May bring
	Toward the Movement of business to the
	Community
	- many thay loose places of more of
	small scale tousiness.
	- It way lead to electricions of holinaria
6	How would you like the negative impacts associated with the project to be addressed?
٥.	The would you may be negative impacts associated with the project so the same as
-	- The government should have proper plans on how
	affected positively links construction.
7	
7.	How would you like the local community/institution/association to be involved in the
7.	How would you like the local community/institution/association to be involved in the project?
7.	
7.	project?
7.	The Journs of the treato be hardred
7.	The fourns of the weato be Involved almost the construction of the word Involved Involved to Improve their Income and
7.	The Journs of the treato be hardred
	The fourns of the weato be Involved almost the construction of the word Involved Involved to Improve their Income and
	The fourns of the area to be Involved dure the construction of the word to be properly to Improve their Income cand to keep them Active in participation.
	The forms of the area to be Involved the forms the construction of the word for the work one of the perfect of the participation. Any other comments proposals concerns about the road project? The word (on struction of uvation should
	The forms of the weato be hardved church the construction of the wood horself to humane their house and horself to humane their house and hardwell the road concerns about the road project? The word construction duration should not take alonger period of time
	The forms of the area to be Involved the former than the way hard the construction of the way harder to have and to keep them Active in participation. Any other comments proposals concerns about the road project? The voad (on the fron duration should not take alonger period of time hence people to be noticed to Appeld
	The forms of the weato be hardved church the construction of the wood horself to humane their house and horself to humane their house and hardwell the road concerns about the road project? The word construction duration should not take alonger period of time

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NAME Emma CHEROTICH ID No: 28280285 Occupation: TEACHER Company/Organization: T · S · C Tel No: 0726 001 664 Location/Area of residence TUNCTION (MAMBOLED)	
Tel No. 0726 001 664 Location/Area of residence JUNCTION (MAMBOLED)	
1. Are you aware of this project? (Tick one) 2. Do you believe this project will be of any benefit to your area Yes [No [] 3. Please tell us how this project will benefit you and the community	
- Accessibility will be improved - Reduce wear and tear of vehicles hence fare an fransport may roduce - Improve beauty of this place	d
4. What are the problems/issues related to the current state of the road? = Dust = portholes: - Mot of mud especially during rainy season: - high fare:	

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5	What are the negative impacts (either environmental or socio-economic) that could result
J.	from the construction and operation of the road?
	-shutting of peoples businesses along
	- alot of oust in the process of noad
	Construction
6	How would you like the negative impacts associated with the project to be addressed?
	- Avoid demolition of peoples structures and businesses
	and businesses
7	How would you like the local community/institution/association to be involved in the
1 .	
	- the locals to be hired in the construction
	ing total
8.	Any other comments/proposals/ concerns about the road project?
	- Hoping H will be completed at once
	- Hoping H will be completed of once unlike mambaled kondele road

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00	ME Josphine Adhiambo ID No. 2990 9780 cupation: Mambolo rad Mag Company Organization: 11 No. 1792628614 Location / Aroa of residence Mambolo Junction
	CONTRACTOR OF STREET CONTRACTO
1.	Are you aware of this project? (Tick one) Yes []No[]
2.	Do you believe this project will be of any benefit to your area Yes [] No []
3.	Please tell us how this project will benefit you and the community
	To make our business grow
	To make our business grow.
4.	What are the problems issues related to the current state of the road?
	The current state of the road,
	is very bad and need en quel

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been	doi	ng bu	RINESS	cilong	the ro
					be involved in
			s about the road		

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	ononii	* Rq.(W)	(1 910W		
		negative impacts locate along			
2		the local commu			
Iny other	r comments/pr	oposals/ concerns	about the road p	roject?	

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For more information please contact us at +254-020-801342. Thank you for your



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NAME ALONS OUMA SKAID No: 25926879 Occupation: Mamyoleo roadback Company/Organization: // Tel No: 0721869147 Location/Area or residence Mamboleo Ju 1. Are you aware of this project? (Tick one) Yes []No[] 2. Do you believe this project will be of any benefit to your area Yes []No[] 3. Please tell us now this project will benefit you and the community 10 Make Our Business grow +b Ume next lever and make transport easier.	
1. Are you aware of this project? (Tick one) Yes []No[] 2. Do you believe this project will be of any benefit to your area Yes []No[] 3. Please tell us how this project will benefit you and the community 10 make 04 business grow to the next level and make	
1. Are you aware of this project? (Tick one) Yes []No[] 2. Do you believe this project will be of any benefit to your area Yes []No[] 3. Please tell us how this project will benefit you and the community 10 make 04 business grow to the next level and make	netion
4. What are the problems/issues related to the current state of the road? The CUTYENT YORD IS VERY boid and needs a repair.	
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	EN MAD MENT DEL RADATON DV & TO
	DWT. DIS RUPTION OF BUSINES -ALON
	THE SAID ROAD
	106 3010 100
6	How would you like the negative impacts associated with the project to be addressed?
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=)	FOR DUST CONSTANT WATER SPRING
	1/1.186.
2	SOME TOKEN OF RE-EMPTRISMENT TO
	BUSINESS OPARATORS ACONG THE POAD.
7	
1.	How would you like the local community/institution/association to be involved in the
	BOTH SHUND AND NON
	BOTH SVALASO AND NON
	SKILLED LABOUR.
8.	Any other comments/proposals/ concerns about the road project?
	CARE BY TAKEN TO PORESTALL THE
	STALLING OF THE PROJECT DUE IS
	FORDER FOR SUCK QUATATION

5. What are the negative impacts (either environmental or socio-economic) that could result

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NA	AME AREX OWIND IDNo: 33287610
0.	CARPENTER Company/Organization: N/A
Te	No. D711885580 Location/Area of residence MAMBOLED
1.	Are you aware of this project? (Tick one) Yes []No [M] Do you believe this project will be of any benefit to your area Yes [M] No []
-	Please tell us now this project will benefit you and the community WILL PROVIDE PAST ACCESSIBILITY TO DITTOR ARCAS. ALSO TO ROBUCE COST OF
	NOVEMBRIS AND LOS DAMALUS TO VEHICLES
4.	What are the problems/issues related to the current state of the road? THE BOT OF TRANS PORT HAS MEEN TOO INTUITE BUF TO COSTS OF NOTAN TO VOITERS (BUBLIC)
	SLOW MOVEMENTS TO WOODS AND PROPER LOOSING MANY BUSINESS HOURS.

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N/ Oc Te	AME Litan Anytings Dags ID No: Company/Organization: I No: 0717870817 Location/Area of residence
1. 2.	Are you aware of this project? (Tick one) Yell []No[] Do you believe this project will be of any benefit to your area Yes [] No[] Please tell us how this project will benefit you and the community
	Accordability in his be exhaused. More charts for one business find be able to access the many him be able to access the many of the second to access the se
4.	What are the problems/issues related to the current state of the road? Two clarky, Dashulty in Marillag. He pout is too rough.

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5.	What are the negative impacts (either environmental or socio-economic) that could result
	from the construction and operation of the road?
	KPONE borated in the referrer will be demotioned
	- Vertice (VC) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Tongeration will be affected
	J. v. v.
6	How would you like the negative impacts associated with the project to be addressed?
U.	A CONTRACT OF THE CONTRACT OF
	New allocation for Supply premise should be
	hardled by My County glovernment
	NOT NOT THE RESIDENCE OF THE PARTY OF THE PA
7.	How would you like the local community/institution/association to be involved in the
	project?
	Part of the second seco
	the Additional to the Addition
	the Millert or becar I had se lenty pool on
	The Politice effects to that all are Micheled
	in lendoment of the men
8.	Any other comments/proposals/ concerns about the road project?
O.	May other comments/proposals/ concerns about the road project:

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NA Oc Te	ME_ cupat No:	0705)	Jango Interior	Design Co Location	No: ompany/Or n/Area of r	2309 ganization! esidence	9513 Johnenn mambolex	interiors
1. 2.	Are y	you aware	of this project	ect? (Tick or	ne) ny benefit	res []No []	Yes [/ No []	netovk
4.	W _{na}	it are the p	robloms/issu	ies related to	the currer	nt state of the	s road?	
	-							

-

	lnare Con	gubber.	Mone); people	in ar	oa can	using
How wo	nuld you like the	Enowh		saciated wi	th the proje	ect to be add	dressed?
How we project?	ould you like	the local	commun	ity∕institutio	n/associatio	on to be	involved in t
Any othe	er comments/p			immed			

For more information please contact us at +254-020-801342. Thank you for your cooperation

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NAME CHRISTING ATTENDIONS: 30613425
Occupation: BUSSINCSS Company/Organization: SELF Tel No: 0724965791 Location/Area of residence MANGOLEO JUNCTIO
Are you aware of this project? (Tick one) Yest []No[] Do you believe this project will be of any benefit to your area Yest [] No[]
3. Please tell us how this project will benefit you and the community. These project will benefit the community. And give young generation the world To doll and years then busy. So we like the project.
4. What are the problems issues related to the current state of the road? The road is in parthetic Condition and it is impassable, so tet lest the project start then the project will banefit the Community

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6. How would you like the negative impacts associated with the project to be addressed?

5. What are the negative impacts (either environmental or socio-economic) that could result

7. How would you like the local community/institution/association to be involved in the project?

The project will give the community the work and the Community will benefit with the project?

8. Any other comments/proposals/ concerns about the road project?

Let the project Start then we as

The community we will benefit

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NA	AME Ruth NYCOCHAMA ID No 2428 49 15
00	cupation: Russiness Company/Organization: SRIT
Te	No: 0723 144 70 Location/Area of residence MWMbdLED
1.	Are you aware of this project? (Tick one) Yos []No[]
2.	Do you believe this project will be of any benefit to your area Yes [] No []
3.	Please tell us how this project will benefit you and the community
	Benefit is for Holling I will benefit to
4.	Problem 15 to MISPIECE PROPRE FOR HEILE WORKING WITH
	People Politery Hisgood towny Side

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	N	IA		
How would you lik	se the negative impact	ts associated with the pr		a?
	N/A			
How would you project?	like the local comm	nunity/institution/associ	ation to be involv	ed in th

5. What are the negative impacts (either environmental or socio-economic) that could result

For more information please contact us at +254-020-801342. Thank you for your cooperation

and I wash the project to

8. Any other comments/proposals/ concerns about the road project?

Start to-MMONDW.

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this particular project.
NAME Dorewer longli ID No: 2096,5579
Occupation: BUSINESS Company/Organization: Tei No: 0723700532 Location/Area of residence Manhollo Junction
1. Are you aware of this project? (Tick one) Yes []No[]
2. Do you believe this project will be of any benefit to your area Yes [] No []
3. Please tell us how this project will benefit you and the community
Economice growth.
Inchase he mobility of people
low Inctod Costs !!
4. What are the problems/issues related to the current state of the read?
Causes of accident as driver trics
to anotel poshile
Hugh Gost of May motor villeda
maintainance many the road

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	List Palocick (Sinc of business and
	How would you like the negative impacts associated with the project to be addressed?
	find a panyanent Souton to realoca of set aside place a Compensation of business or bulding That more by demonstrated.
	How would you like the local community/institution/association to be involved in the project? This and the second of the points around the angle of the second of the sec
*//	Any other commented proposals concerns about the road project? Do Siegra and diviliant to be

For more information please contact us at +254-020-801342. Thank you for your segrentian

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C	IME SOSEPH WCHIENCE ID No. 9183683
7	cupation: Punche repair Company/Organization: 1 No: 0712564544 Location/Area of residence MAMBOLES
	Are you aware of this project? (Tick one) Yes []No[] Do you believe this project will be of any benefit to your area Yes [] No[]
	Do you believe this project will be of any benefit to your area. Yes [] No []
	D
	This project will benefit my Bussiness
	- ms find and the second
	What are the problems/issues related to the current state of the road? The curent Read is very bad 50 it reads Though be repaired.
	The curent Road is very bad soit needs
	should be repaired.

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5.	What are the negative impacts (either environmental or socio-economic) that could result
	from the construction and operation of the road?
	Although the project will make my business grow up, it will force me to reallest my
	bisinoss place.
6.	How would you like the negative impacts associated with the project to be addressed?
7.	How would you like the local community/institution/association to be involved in the
	project?
8.	Any other commental proposals of concerns about the road project? Do not readoted us too much.
	dis hot stancita as the man

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For more information please contact us at +254-020-801342. Thank you for your



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

The Government of Kenya has carmarked funds through the Development Vote to renabilitate the Kisumu-Chemeiii- Muhoroni Road. The proposed 62.0 kilometer (km) two lane road, starting from Kisumu Mamboleo Junction will cover Kisumu County, running across the Nyando River and linking to the B1 road. The proposed road corridor will form an integral contribution to social economic development as it links centres such as Mamboleo, Guba, Koleng, Miwani Jua Kaii, Chemase Chepserta, Chemeiii, Oseng, Muhoroni junction and Bangia junction linking the proposed C34 road to B1 at km 62.

According to Environmental Management and Coordination Act, Cap 387, public consultation is vital to effective management of environmental and social impacts associated with projects. KeNHA therefore humbly request for your views and concerns as regards to the proposed project.

Please note that your name and information therein will \underline{ONLY} be used for the stated purpose in this particular project.

000	upat	Dayla	alonist		Compar	312532 ny/Organization: a of residence	Mambo	co ·
2.	Dos	you believe	e this proj	ect will i	be of any be	Yws []No [mefit to your are ou and the comm	a Y [] No []	
		Create	106	opp	atunity	-		
1.	Wna	at are the p	oroblems/i	ssues rel	ated to the c	current state of th	ne road?	
		Con	ientio	n				

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5. What are the negative impacts (either environmental or socio-economic) that could result from the construction and operation of the road?

Population increase Lack of job opportunity

6. How would you like the negative impacts associated with the project to be addressed?

Those being affected should be compensated

7. How would you like the local community/institution/association to be involved in the project?

They should be walking door-ti-door explaining to the businesses premises on they are going to be compensated.

8. Any other comments/proposals/ concerns about the road project?

The project is Okay 1st they consider those the needs of the affected bursiness pple coz that's their doily needs.

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NAME VITALIS OTURA IDNO: 4847682
Occupation: MCA Company/Organization: KLSUMU COUNTY
Tel No. D72080/584 Location/Area of residence DMBETI
1. Are you aware or this project? (Tick one) Yes [No [] 2. Do you believe this project will be of any benefit to your area Yes [] No [] 3. Please tell us now this project will benefit you and the community If will spen up tanglow system in the Suggitable area and light special Economic 2 and other countries for Economic growth is the sular
4. What are the problems issues related to the current state of the road? The wift about to county of the county
- Poer Socio oconomia co-experience influi-

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	How would you like the negative impacts associated with the project to be addressed?
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	How would you like the local community/institution/association to be involved in project?
	Any other comments/proposats/ concerns about the road project?
	Any other comments/proposals/ concerns about the road project?

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QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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NAME Joseph Almbarkah IDNo: 12598130
Company Organization HDM9 LIME Co. 2100
Tel No. 0121 838658 Location/Area of residence
1. Are you aware of this project? (Tick one) Yes [No []
2. Do you believe this project will be of any benefit to your area Yes [No []
3. Picase tell us how this project will benefit you and the community including (foodurg. () Transportation of fraduce including (foodurg. () Decoralst Kirumu City
3) Shorten distance to Kwami Neighboring ton
4. What are the problems issues related to the current state of the road? (D) Congestion in Missimu City
a hong distance
Deficient tramportation history Cot.

5.	What are the negative impacts (either environmental or socio*economic) that could result
	from the construction and operation of the road?
	@ Azcidens
6.	How would you like the negative impacts associated with the project to be addressed?
	@ fronde some hauting
	a more some nguting
7.	How would you like the local community/institution/association to be involved in the project?
	1 Harb obor obne look was
8.	Any other comments proposals concerns about the posa project? Consider the following loof read Kom - Muhami Landiai Ad Kom - Wan Miria - Wans
p	Kom - Kom Polici Kom - 15ton 201322 time Road
	or more information please contact us at +234-020-801342. Thank you for your operation



QUESTIONNAIRE FOR ENVIRONMENTAL AND SOCIAL IMPACTASSESSMENT STUDY REPORT

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NAME ON JOHO (AMUST)

Do 91158

Occupation: ARMING Company/Organization: KANTHOWN FC SOURTY

Tel No:072315165 Location/Area of residence Att Fro

1. Are you aware of this project? (Tick one) Yest No []

2. Do you believe this project will be of any benefit to your area Yest No []

3. Please tell us how this project will benefit you and the community

The durchymore of Sprv Road MWAN DARRY

OMAKA MI Government of the Instituted My

Award on Commercial scale frade and

What are the problems/ issues related to the current state of the road?

What are the problems/ issues related to the current state of the road?

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What are the problems/ issues related to the current state of the road?

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What are the problems/ south of the current state of the road?

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My And My My Sprudy we added to the current state of the road?

My And My My Sprudy we added to the current state of the road?

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1	low would you like the negative impacts associated with the project to be addressed?
	low would you like the local community/institution/association to be involved is project?
-	Any other comments/proposats/ concerns about the road project?

2



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N/	AME Boala cupation: Law 1 No: 070579	Manga	_ID No:	754284	Vahat	Days Com
Te	No: 070579	5839 Lo	Company/Or cation/Area of re	ganization.	Lisumi	1_
1.	Are you aware of Do you believe th	this project? (T	ick one)	es []No[] to your area Ye	» [] No []	
3.	Please tell us new	this project will	Bewli	the community		
4.	What are the prot	142-		essiple f		7

cooperation

How would yo	ou like the negative impacts associated with the project t	o be addressed?
How would 3 project?	ou like the local community/institution/association	to be involved in the

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For more information please contact us at +254-020-801342. Thank you for your

APPENDIX 6: NEMA APPROVED ESIA TORS