



**STATE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT,
MINISTRY OF LANDS, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT SECOND KENYA
INFORMAL SETTLEMENTS IMPROVEMENT PROJECT (KISIP 2)**

**CONSULTING SERVICES FOR INFRASTRUCTURE UPGRADING PLANS, DETAILED ENGINEERING DESIGNS
AND PREPARATION OF PROCUREMENT DOCUMENTS AND CONSTRUCTION SUPERVISION OF
INFRASTRUCTURE IMPROVEMENT WORKS IN SELECTED INFORMAL SETTLEMENTS IN THE COUNTIES
OF NYERI, MERU, THARAKA-NITHI, AND WAJIR. (ONE CONTRACT).**



**ENVIRONMENTAL AND SOCIAL COMPREHNSIVE PROJECT REPORT FOR THE
PROPOSED IMPROVEMENT WORKS IN MARIMANTI INFORMAL SETTLEMENTS IN
THARAKA NITHI COUNTY**

CONSULTANT

In jv with



APRIL, 2024

“DOCUMENT CONTROL”

PROPOSED IMPROVEMENT WORKS IN MARIMANTI INFORMAL SETTLEMENTS IN THARAKA NITHI COUNTY

ESIA COMPREHENSIVE PROJECT REPORT

CLIENT



Chief Officer, Department for Lands, Housing, Physical Planning, Public Works and Urban Development (CO-LHPP&UP)

CONSULTANT

gath CONSULTING ENGINEERS	In jv with	 Losai Management Limited
-------------------------------------	------------	--

DOCUMENT TITLE:

ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT COMPREHENSIVE PROJECT REPORT

RECORDS FOR REVISION

Version No.	Dated:	Description / Purpose of issue:	Prepared by:	Reviewed by:	Approved by:
01	April, 2024	Draft ESIA CPR (April 2024)	GATH in Jv with LOSAI	Dr. S.C	

SUBMISSION DETAILS

Certificate of Declaration and Document Authentication

This document has been prepared in accordance with the Environmental Management and Coordination Act 2015, Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019, KISIP 2 Environment and Social Management Framework (ESMF) and World Bank Operation Policies.

This project report is prepared for and on behalf of:

LEAD EXPERT/FIRM OF EXPERT-11481	PROPOSER
LOSAI MANAGEMENT LTD P.O BOX 30337-00100 Nairobi Kenya FAX: +254.20.263.2996 TEL: +254.788.352.533, + 254.20.263.2996, +254.718.875.310 Email: info@losaimanagement.com	Chief Officer, Department for Lands, Housing, Physical Planning, Public Works and Urban Development (CO-LHPP&UP), Office: County Government of Tharaka Nithi- Kathwana, Procurement Office Address: P.O Box 10-60406, Kathwana, Tharaka Nithi Tel No: 0800720370 / 0713588460 Email: info@tharakaNithi.go.ke
Name:	Name:
Designation:	Designation:
Date:	Signed
Signed	Date:

DISCLAIMER:

This Environmental impact assessment comprehensive project report is based on literature review, consultations and findings from field assessment. It is however, subject to conditions in the Environmental Management and Coordination Act 2015, Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019 KISIP 2 Environment and Social Management Framework (ESMF) and World Bank Operation Policies.

FACT SHEET

Program Name	Kenya Informal Settlement Improvement Project II (KISIP 2)
Assignment Name	Consulting services for infrastructure upgrading plans, detailed engineering designs and preparation of procurement documents and construction supervision of infrastructure improvement works in selected informal settlements in the counties of Nyeri, Meru, Tharaka-Nithi, and Wajir. (One contract).
Report Name	Environmental & social impact assessment comprehensive project report for the proposed improvement works in Marimanti informal settlements in Tharaka Nithi County
Lead Implementing Agency	County Government of Tharaka Nithi
Financier	World Bank
Project Components	<ol style="list-style-type: none"> 1. Water <ul style="list-style-type: none"> • 3.3km OD50-OD90 HDPE Pipeline • 1No. Elevated Water Tank • 150 household connections 2. 0.74 km of bitumen Road 3. 1No ablution block
Project Cost	Ksh 141,995,212.42
Project Location	Marimanti
Project Beneficiaries	Residents of Marimanti informal settlement and surrounding environment
Lead Expert	Dr. Stephen Chege Wairuri Reg. No. 1580
Associate Expert	Lydiah Mbogo-Reg. Nr. 6007 Sarah Karanja

TABLE OF CONTENTS

SUBMISSION DETAILS	III
FACT SHEET	IV
LIST OF TABLES	XVII
LIST OF FIGURES	XVIII
LIST OF ANNEXES	XX
ABBREVIATIONS	XXI
EXECUTIVE SUMMARY	XXII
E.1 Project Background	xxii
E.2 Scope of the Prioritized works	xxii
E.3 The Project	xxiii
E.4 Project Components	xxiii
E.5 Policy, Legal and Administrative Framework	xxiv
E.6 Highlights of Stakeholder Consultations	XXV
E.7 Project Impacts	XXV
E.8 Environmental and social management and monitoring plan	xxxv
E.9 Findings	XXXV
E.10 Recommendations	xxxvi
E.11 Conclusion	xxxvii
CHAPTER 1: INTRODUCTION	1
1.1. Project Background	1
1.2. Project Justification and Benefit	3
1.3. Objectives of the Environmental Social Impact Assessment (ESIA)	3
1.3.1 General Objective	3
1.3.2 Specific Objectives of ESIA Investigations	4
1.4. Project Study Scope and Objectives	4
1.4.1 Project Objectives	4
1.4.2 Scope	5
1.5. ESIA Approach and Methodology	6

1.5.1	Literature Review	6
1.5.2	Environmental and Social Screening	6
1.5.3	Environmental and Social Scoping	7
1.5.4	Baseline Data Collection	7
1.5.5	Identification, Prediction and Determination of Environmental Impacts	8
1.5.6	Stakeholder Consultations	9
CHAPTER 2: PROJECT DESCRIPTION		10
2.1	Existing Water Supply Condition	10
2.2	Existing sanitation condition	10
2.3	Existing Road Condition	11
2.4	Solid Waste Management	12
2.5	Proposed water interventions	12
2.5.1	Water Pipelines	12
2.5.2	Elevated Water Tank	13
2.5.3	Individual Connections	13
2.5.4	Fire Hydrant	14
2.6	Proposed sanitation intervention	14
2.7	Proposed Road Network	15
2.8	Proposed project activities	15
2.8.1	Project Mobilization & Construction Phase	15
2.8.2	Campsite and Mobilization of workers	16
2.9	Mainstreaming Climate Resilience in Infrastructural Projects	17
2.10	Project Cost	21
CHAPTER 3: ENVIRONMENTAL AND SOCIAL BASELINE CONDITION		23
3.1	Introduction	23
3.2	Geographical characteristic of the project area	23
3.2.1	Overview of Tharaka Nithi County	23
3.2.2	Demographic Features of Tharaka Nithi County	24
3.2.3	Project Area	32
3.2.4	Climate	33

3.2.5	Geology and Ecological conditions	34
3.2.6	Physical and Topographical Features	34
3.2.7	Economic activities	35
3.2.8	Soil Characteristics	35
3.2.9	Solid and liquid wastes	35
3.3	Ecological Environment, Flora and Fauna	35
3.4	Noise pollution Levels	35
3.5	Air quality Tolerance Levels	36
3.6	Water Quality – Standard Effluent Discharge into the Environment	38
CHAPTER 4:	ANALYSIS OF PROJECT ALTERNATIVES	41
4.1	Overview	41
4.2	Project Resettlement Impacts	41
4.3	Analysis of Alternative Material	41
4.4	No Project Alternative	42
4.5	Proposed Project Option	43
CHAPTER 5:	POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK	44
5.1	Introduction	44
5.2	Environmental Policy Framework	44
5.2.1	Constitution of Kenya 2010	44
5.2.2	The National Environment Action Plan (NEAP)	45
5.2.3	National Land Policy 2009	45
5.2.4	Kenya Vision 2030	46
5.2.5	The Kenya Environmental Sanitation and Hygiene Policy 2016-2030	46
5.3	Overview of Relevant Legislation	47
5.3.1	The Environmental Management and Coordination (Amendment) Act, 2015	47
5.3.2	The National Poverty Eradication Plan (NPEP)	51
5.3.3	Water Act 2016	51
5.3.4	Water Rules 2021	52
5.3.5	The Penal Code CAP 63	52
5.3.6	County Government Act No. 17 of 2012	53

5.3.7	Traffic Act, Chapter 403	53
5.3.8	Public Roads and Roads of Access Act (Cap. 399)	53
5.3.9	The Kenya Roads Act – (CAP 399) NO. 2, 2007	54
5.3.10	The Physical and Land Use Planning Act, 2019	54
5.3.11	Occupational Health and Safety Act (OSHA 2007)	55
5.3.12	The Public Health Act (Cap.242)	56
5.3.13	Climate Change Act, 2016	57
5.3.14	Employment Act	57
5.3.15	Work Injury Benefits Act (WIBA)	58
5.3.16	The National Museums and Heritage Act-Cap 216 (2006)	58
5.3.17	Environmental and Land Court Act) 2011)	59
5.3.18	Sustainable waste Management Act, 2022;	59
5.3.19	Urban Areas and Cities Act, 2011	60
5.3.20	National Construction Authority (NCA) 2011	60
5.4	Tharaka Nithi County Government Relevant Legislations and Policies	60
5.4.1	Tharaka Nithi Gender Main Streaming Policy 2019	60
5.4.2	Tharaka Nithi County Climate Change Fund Act 2019	61
5.4.3	Tharaka Nithi County Traffic and Transport Management Bill, 2020	61
5.4.4	Tharaka Nithi County Public Nuisances Bill, 2019	62
5.4.5	Tharaka Nithi County Youth Empowerment Act, 2020	62
5.4.6	Tharaka Nithi County Spatial Planning Bill, 2016	62
5.5	World Bank Operational Safeguard Policies	62
5.5.1	Operational Policy 4.01: Environmental Assessment	63
5.5.2	Operational Policy 4.11-Physical Cultural Resources	63
5.5.3	The Bank's Operational Policy 4.12: Involuntary Resettlement	63
5.5.4	World Bank Directive on Vulnerable Groups	64
5.5.5	World Bank Policy on Access to Information, 2010	64
5.6	World Bank GROUP Environmental, Health and Safety (EHS) Guidelines	65
5.6.1	Environmental Guidelines	65
5.6.2	Occupational Health and Safety Guidelines	66
5.6.3	Community Health and Safety Guidelines	67

5.6.4	Construction and Decommissioning Guidelines.....	68
5.7	Applicability of World Operational Safeguards.....	68
5.8	Sustainable Development Goals	69
5.8.1	SDG 6: Clean Water and Sanitation	69
5.8.2	SDG 9: Industries, Innovation and Infrastructure	70
5.8.3	SDG 11: Sustainable Cities and Communities	70
5.9	Multilateral Environmental Agreement	70
5.9.1	Paris Agreement.....	70
5.9.2	United Nations Framework Convention on Climate Change (UNFCCC),	70
5.9.3	World Heritage Convention.....	70
5.9.4	The Convention on Biological Diversity.....	71
5.10	Project Implementation Institutional Structure	71
5.11	Institutional Structure	71
5.11.1	Ministry of Environment and Natural Resource	72
5.11.2	The Ministry of Transport, Infrastructure, Housing and Urban Development (MoTIHUD)	72
5.11.3	County Government of Tharaka Nithi	72
5.11.4	National Environment Management Authority (NEMA).....	72
5.11.5	Water Resources Authority (WRA)	72
5.11.6	Water Services Regulatory Board (WASREB)	73
5.11.7	Directorate of Occupational Safety and Health Services (DOSH)	73
CHAPTER 6: STAKEHOLDER CONSULTATION	74
6.1	Background to public consultation in ESIA	74
6.2	Aims and Objectives of Stakeholders Consultation and Public Participation (CPP)	74
6.3	Approach of Stakeholder Consultation	75
6.3.1	Stakeholder mapping	75
6.3.2	Stakeholder Consultation Activities	76
6.4	Stakeholder Consultation	77
6.4.1	Interviews	78
6.4.2	Output of the questionnaire administered to members of the public	80
CHAPTER 7: IMPACTS IDENTIFICATION AND MITIGATION MEASURES	92

7.1	Introduction	92
7.2	Definition and Classification of Environment Impact	92
7.2.1	Impact Assessment and Scoring	92
7.3	Pre-construction phase Positive Impacts for Roads Project	93
7.3.1	Documentation and publicity	93
7.3.2	Employment	94
7.4	Pre- Construction Negative impacts for Roads Project	94
7.4.1	Temporary land interference	94
7.4.2	Influx of workers from other areas	94
7.5	Construction Phase Positive Impacts for Roads Project	94
7.5.1	Employment opportunities	94
7.5.2	Creation of a market for construction materials	95
7.5.3	Increased local incomes	95
7.5.4	Economic growth	95
7.5.5	Injection of money into the local economy	95
7.6	Construction Phase Negative impacts for Roads Construction	95
7.6.1	Noise and Excessive Vibrations	95
7.6.2	Air Pollution and Dust Generation	96
7.6.3	Vegetation Clearing, Soil Erosion and Sedimentation	97
7.6.4	Solid Wastes Generation from Construction activities	97
7.6.5	Impacts on Soils	98
7.6.6	Project Impact on Water	99
7.6.7	Accidental Oil and fuel Spills and Leaks	100
7.6.8	Loss of Temporal Assets and Sources of Livelihood	100
7.6.9	Disruption of Public Utilities	101
7.6.10	Risk of Accidents at Work Sites	101
7.6.11	Traffic Congestion and Inconveniences	102
7.6.12	Labour influx and Sexual Offences to Minors	104
7.6.13	Increased Transmission of HIV/AIDS	104
7.6.14	Human Rights Principles and Gender Inclusivity	105
7.6.15	Increased Crime and Insecurity	105

7.6.16	Gender Based Violence.....	105
7.6.17	Sexual Exploitation and Abuse (SEA)	107
7.6.18	Child Labour and Protection	108
7.6.19	Conflicts between Contractor and Community.....	109
7.6.20	Project Intervention Priority Conflicts.....	109
7.7	Operation phases Positive Impacts for Roads Construction	109
7.7.1	Creation of employment.....	110
7.7.2	Improved transport and economy of the people	110
7.7.3	Creation of Wealth	110
7.7.4	Improved revenue for County Government	110
7.8	Operation Phase Negative Impacts for Roads Project.....	110
7.8.1	Risk of Encroachment and Construction of Structures on the Road Reserve	110
7.8.2	Visual and landscape impact management	110
7.8.3	Pollution of water and soils	111
7.8.4	Health and Safety Risks	111
7.9	Decommissioning Phase Positive impact for Road Project	111
7.9.1	Employment opportunities	112
7.9.2	Environmental rehabilitation.....	112
7.10	Decommissioning Phase Negative Impacts for Road Project	112
7.10.1	Noise Pollution	112
7.10.2	Solid Waste Material	112
7.10.3	Occupational health and safety	112
7.11	Pre-construction phase Positive Impacts for Water Project	113
7.11.1	Documentation and publicity	113
7.11.2	Employment.....	113
7.12	Pre- Construction Negative impacts for Water Project	113
7.12.1	Temporary land interference	113
7.12.2	Influx of workers from other areas	113
7.13	Construction Phase Positive Impacts for Water Project	114
7.13.1	Employment opportunities	114
7.13.2	Creation of a market for construction materials	114

7.13.3 Increased local incomes	114
7.13.4 Economic growth	114
7.13.5 Injection of money into the local economy	115
7.14 Construction Phase Negative impacts for Water Project	115
7.14.1 Noise and Excessive Vibrations	115
7.14.2 Air Pollution and Dust Generation	115
7.14.3 Vegetation Clearing, Soil Erosion and Sedimentation	116
7.14.4 Solid Wastes Generation from Construction activities	117
7.14.5 Impacts on Soils	117
7.14.6 Project Impact on Water	118
7.14.7 Accidental Oil and fuel Spills and Leaks	119
7.14.8 Loss of Temporal Assets and Sources of Livelihood	120
7.14.9 Disruption of Public Utilities	120
7.14.10 Risk of Accidents at Work Sites	120
7.14.11 Traffic Congestion and Inconveniences	122
7.14.12 Labour influx and Sexual Offences to Minors	123
7.14.13 Increased Transmission of HIV/AIDS	124
7.14.14 Human Rights Principles and Gender Inclusivity	124
7.14.15 Increased Crime and Insecurity	125
7.14.16 Gender Based Violence	125
7.14.17 Sexual Exploitation and Abuse (SEA)	126
7.14.18 Child Labour and Protection	127
7.14.19 Conflicts between Contractor and Community	128
7.14.20 Project Intervention Priority Conflicts	129
7.15 Operation phases Positive Impacts for Water Project	129
7.15.1 Creation of employment	129
7.15.2 Creation of Wealth	129
7.15.3 Improved Well-being of Women and Children	129
7.15.4 Improved Accessibility to Clean and Reliable Water Supply	129
7.15.5 Improved revenue for NIWASCO	130
7.15.6 Reduced exposure to health risks and improved nutrition	130

7.16	Operation Phase Negative Impacts for Water Project	130
7.16.1	Risk of illegal connection and Vandalism of the Pipeline	130
7.16.2	Increased domestic wastewater generation.....	130
7.16.3	Risk of water pipeline bursts leading to water wastages	130
7.16.4	Risk of Encroachment and Construction of Structures on the Pipeline Way Leave	131
7.16.5	Visual and landscape impact management	131
7.16.6	Increase in Social Vices	131
7.16.7	Pollution of water and soils	132
7.16.8	Health and Safety Risks	132
7.17	Decommissioning Phase Positive impact for Water Project	132
7.17.1	Employment opportunities	133
7.17.2	Environmental rehabilitation	133
7.18	Decommissioning Phase Negative Impacts for Water Project	133
7.18.1	Noise Pollution	133
7.18.2	Solid Waste Material	133
7.18.3	Occupational Health and Safety	133
7.19	Pre-construction phase Positive Impacts for Ablution Block	134
7.19.1	Documentation and publicity	134
7.19.2	Employment	134
7.20	Pre- Construction Negative impacts for Ablution Block Construction	134
7.20.1	Temporary land interference	134
7.20.2	Influx of workers from other areas	134
7.21	Construction Phase Positive Impacts for Ablution Block Construction	135
7.21.1	Employment opportunities	135
7.21.2	Creation of a market for construction materials	135
7.21.3	Increased local incomes	135
7.21.4	Economic growth	135
7.21.5	Injection of money into the local economy	136
7.22	Construction Phase Negative impacts for Ablution Block Construction	136
7.22.1	Noise and Excessive Vibrations	136
7.22.2	Air Pollution and Dust Generation	136

7.22.3 Vegetation Clearing, Soil Erosion and Sedimentation	137
7.22.4 Solid Wastes Generation from Construction activities	138
7.22.5 Impacts on Soils	138
7.22.6 Project Impact on Water	139
7.22.7 Accidental Oil and fuel Spills and Leaks	140
7.22.8 Loss of Temporal Assets and Sources of Livelihood	141
7.22.9 Disruption of Public Utilities	141
7.22.10 Risk of Accidents at Work Sites	142
7.22.11 Traffic Congestion and Inconveniences	143
7.22.12 Labour influx and Sexual Offences to Minors	144
7.22.13 Increased Transmission of HIV/AIDS	145
7.22.14 Human Rights Principles and Gender Inclusivity	145
7.22.15 Increased Crime and Insecurity	146
7.22.16 Gender based violence	146
7.22.17 Sexual Exploitation and Abuse (SEA)	147
7.22.18 Child Labour and Protection	148
7.22.19 Conflicts between Contractor and Community	149
7.22.20 Project Intervention Priority Conflicts	150
7.23 Operation phases Positive Impacts for the Ablution Block Project	150
7.23.1 Creation of employment	150
7.23.2 Creation of Wealth	150
7.23.3 Reduced exposure to health risks and improved nutrition	150
7.24 Operation Phase Negative Impacts for Ablution Block	150
7.24.1 Visual and landscape impact management	150
7.24.2 Risk of vandalism of the ablution block facilities	151
7.24.3 Pollution of water and soils	151
7.24.4 Health and Safety Risks	151
7.25 Decommissioning Phase Positive impact for Ablution Block	151
7.25.1 Employment opportunities	151
7.25.2 Environmental rehabilitation	152
7.26 Decommissioning Phase Negative Impacts Ablution Block	152

7.26.1 Noise Pollution	152
7.26.2 Solid Waste Material	152
7.26.3 Occupational health and safety	152
7.27 Impact Analysis	153
CHAPTER 8: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP) 184	
8.1 Introduction	184
8.1.1 Planning and design phase	184
8.1.2 Construction phase	184
8.1.3 Operations	184
8.1.4 Decommissioning Phase	184
8.2 Objective of the ESMMP	185
8.3 Responsibilities for the Environmental and Social Management Plan	185
8.4 Environmental Social Management and Monitoring Plan	188
8.4.1 Environmental and Social Management and Monitoring Plan (ESMMP) Roads Component	189
8.4.2 Environmental and Social Management and Monitoring Plan (ESMMP) Water Component	216
8.4.3 Environmental and Social Management and Monitoring Plan (ESMMP) Ablution Block	245
8.5 Grievance Resolution Mechanism	271
8.6 GBV GRM Protocol	273
8.7 Avenues of Channelling GBV-GRM Related Cases	275
8.8 Timeframe for processing Grievances	275
8.9 Chance Finds Procedure	277
CHAPTER 9: CONCLUSION AND RECOMMENDATIONS	279
9.1 Conclusion	279
9.2 Recommendation	279
REFERENCES	280
ANNEXES	281

Annex 1: Lead Expert NEMA License	281
Annex 2: Minutes and Attendance Sheet	282
Annex 3: Sample Chance Find Procedure	289
Annex 4: Sample filled questionnaires	290
Annex 5: Signed BoQ	294
Annex 6: Approved Environmental and Social Screening Report	295

LIST OF TABLES

Table 1:1: List of KII consulted	1
Table 1:2: List of Participants	1
Table 2:1: Project Cost	1
Table 3:1: population projection (by sub-county and sex)	1
Table 3:2: Population Projections by Age Cohort	1
Table 3:3: Population Projection by Urban Area	1
Table 3:4: Population distribution and density by sub-county	1
Table 3:5: Population Projection by Broad Age Groups	1
Table 3:6: Population of Persons with Disability	1
Table 3:7: Demographic Dividend Potential	1
Table 3:8: Maximum permissible noise levels	1
Table 3:9: maximum permissible noise levels for construction sites	1
Table 3:10: Air quality Tolerance Limits	1
Table 3:11: standard effluent discharge into the environment	1
Table 5:1: Summary of Applicability of World Operational Safeguards	1
Table 6:1: Stakeholder Inventory	1
Table 6:2: Stakeholder Consultation Activities	1
Table 6:3: Stakeholder Consultation comment and responses	1
Table 6:4: Water challenges within the settlement	1
Table 7:1: Impact Rating Criteria for Environment and Social Risks	1
Table 7:2: Impact analysis for roads	1
Table 7:3: Impact analysis for Water	1
Table 7:4: Impact analysis for Ablution Block	1
Table 7:5: Impact analysis for Ablution Block	1
Table 8:1: Decommissioning Flow Chart	1
Table 8:2: Responsibilities for Environmental and Social Management	1

Table 8:3: Pre-Construction Phase ESMMP roads	1
Table 8:4: Construction ESMMP Roads	1
Table 8:5: Operational ESMMP Roads	1
Table 8:6: Decommissioning ESMMP Roads	1
Table 8:7: Preconstruction ESMMP Water	1
Table 8:8: Construction ESMMP Water	1
Table 8:9: Operational ESMMP Water	1
Table 8:10: Decommissioning ESMMP Water	1
Table 8:11: Preconstruction ESMMP Ablution Block	1
Table 8:12: Construction ESMMP Ablution Block	1
Table 8:13: Operational ESMMP Ablution Block	1
Table 8:14: Decommissioning ESMMP Ablution Block	1
Table 8:15: Avenues of Channelling GBV-GRM Related Cases	1
Table 8:16: Time Frame for Processing Complaints	1

LIST OF FIGURES

Figure 1- 1: KISIP 2 Project Areas Locations	1
Figure 2- 1: Existing water infrastructure in Marimanti	10
Figure 2- 2: Existing Sanitation facilities	11
Figure 2- 3: Existing Road Reserve	12
Figure 2- 4: Proposed Water Network (Source: Consultant Design Reports)	13
Figure 2- 5: Typical layout of ablution block (Source: Consultant Design Reports)	14
Figure 3- 1: Location Map of Tharaka Nithi County	24
Figure 3- 2: Map showing project areas in Tharaka Nithi County	33
Figure 6- 1: Photographs taken during Stakeholder Consultation	78
Figure 6- 2: Distribution of years lived in Marimanti	81
Figure 6- 3: Main Occupation of the Household Head	82

Figure 6- 4: Education distribution of the household head	82
Figure 6- 5: Status of Water in Marimanti	83
Figure 6- 6: Status of Sanitation in Marimanti	83
Figure 6- 7: Status of solid waste management	84
Figure 6- 8: Status of Road	84
Figure 6- 9: Security Status	85
Figure 6- 10: Types of sanitation facilities in the area	86
Figure 6- 11: Type of security issues	87
Figure 6- 12: Road use Challenges	87
Figure 6- 13: Mode of solid waste disposal	88
Figure 6- 14: Anticipated project positive impacts	89
Figure 6- 15: Anticipated Negative impacts	89
Figure 6- 16: Project support and awareness	91

LIST OF ANNEXES

Annex 1: Lead Expert NEMA License	281
Annex 2: Minutes and Attendance Sheet	282
Annex 3: Sample Chance Find Procedure	289
Annex 4: Sample filled questionnaires	290
Annex 5: Signed BoQ	294
Annex 6: Approved Environmental and Social Screening Report	295

ABBREVIATIONS

AIDs	Acquired immunodeficiency Syndrome
BoQ	Bill of Quantity
COC	Code of Conduct
EHS	Environment Health and Safety
ESIA	Environmental and Social Impact Assessment
EMCA	Environmental Management & Coordination Act
ESMMP	Environmental and Social Management Plan
GBV	Gender Based Violence
GIS	Geographic Information System
GoK	Government of Kenya
GRC	Grievance Redress Committee
HIV	Human Immunodeficiency Virus
km	Kilometer
MM	Millimeter
NIWASCO	Nithi Water and Sanitation Company
NEMA	National Environment Management Authority
NEP	National Environment Policy
NGAO	National Government Administrative Officers
OSH	Occupational Safety and Health
OSHA	Occupational Health and Safety Act
PPEs	Personal Protective Equipment
PN	Pression Nominal
PVC	Polyvinyl Chloride
RAP	Resettlement Action Plan
SDGs	Sustainable Development Goals
SEA	Sexual Exploitation and Abuse
SEC	Settlement Executive Committee
STD	Sexually Transmitted Diseases
WIBA	Work Injury Benefits Act

EXECUTIVE SUMMARY

E.1 Project Background

The Government of Kenya received credit facility from the World Bank through International Development Association (IDA) and Agence Française de Développement (AFD) towards the cost of the Second Kenya Informal Settlements Improvement Project (KISIP 2) whose primary goal is to improve living conditions in informal settlements in selected towns in Kenya. The objective of the assignment is to prepare infrastructure upgrading plans, detailed engineering designs, procurement documents, resettlement action plan (RAP) and environmental and social impact assessment (ESIA) reports; and supervision of infrastructure construction works in selected informal settlements in Nyeri, Tharaka Nithi, Meru and Wajir Counties.

The Principal Secretary, State Department of Housing and Urban Development, Ministry of Lands, Public Works, Housing and Urban Development Second Kenya Informal Settlements Improvement Project (KISIP 2) has appointed Losai Management Limited in JV with Gath Consulting Engineers Ltd to provide Consultancy services for Infrastructure Upgrading Plans, Detailed Engineering Designs and Preparation of Procurement Documents and Construction Supervision of Infrastructure Improvement Works in Selected Informal Settlements in Nyeri, Meru, Tharaka-Nithi and Wajir Counties

The Environmental Management and Coordination (Impact Assessment and Audit) Regulations, 2019 stipulates that either Comprehensive or Summary Environmental and social Impact Assessment (ESIA) Project Reports should be prepared for low and medium risk projects listed in the Second Schedule. The proposed project interventions in Marimanti Informal settlement falls in the Category 2 of Medium Risk Projects under the Environmental Management and Coordination Act (amendment), 2019, thus an Environmental Social Impact Assessment (ESIA) Comprehensive Project Report (CPR) is required. It is in response to this provision, that this report has been prepared

This is an Environmental and Social Impact Assessment (ESIA) Comprehensive Project Report (CPR) for the interventions proposed in Marimanti Informal settlement in Tharaka Nithi County.

E.2 Scope of the Prioritized works

The scope of construction works proposed for Marimanti informal settlement involves construction of:

1. Water
 - 3.3km OD50-OD90 HDPE Pipeline
 - 1No. Elevated Water Tank
 - 150 household connections

2. 0.74 km of bitumen Road
3. 1.No ablution block

E.3 The Project

The Consultant has carried out detailed design, prepared tender documents and is also making necessary application to obtain all the necessary documents including the National Environment Management Authority (NEMA) license.

The main objective of this proposed project is to improve access to basic services and tenure security of residents in participating urban informal settlements and strengthen institutional capacity for slum upgrading in Kenya. This will be achieved by investing in infrastructure based plans developed in consultation with the community, by supporting planning, surveying and issuance of land documents for residents of informal settlements, and by strengthening capacity of county administrations to deliver on their mandates.

E.4 Project Components

The proposed project will comprise the following four components.

Component 1 (Integrated Settlement Upgrading): KISIP 2 has built on the lessons learned from KISIP 1 and has combined tenure regularization and infrastructure into one integrated upgrading approach to save both money and time, ensuring better coordination between the two interventions in a settlement and deepening the project's overall impact on the participating communities by supporting tenure regularization and infrastructure upgrading in the same communities. Thus, two main interventions have been identified under this component: (i) tenure regularization; and (ii) infrastructure upgrading. Settlements will benefit from one or both interventions depending on the initial condition of the settlement. Under tenure regularization, KISIP 2 will support the chain of activities required to regularize tenure for people living on uncontested public lands. Based on experiences of KISIP 1, the project will minimize displacement of residents in planning using 'adoptive' planning approach to minimize displacement of residents in informal settlements. Under infrastructure upgrading, KISIP2 will support the same types of investments: roads, bicycle paths, pedestrian walkways, street and security lighting, vending platforms, solid waste collection and settlement sorting, storm water drainage, water and sanitation systems, public parks, and green spaces. The menu will also include investments related to prevention of crime and violence, including but not limited to community centers. Most of the infrastructure will contribute to climate resilience and the project will have substantial climate change adaptation and mitigation co-benefits.

Component 2 (Socio-Economic Inclusion Planning): This component will support the development of community-level socio-economic plans. The plans intend to identify together

with the communities their socio-economic needs and then address how best the needs can be met.

Component 3 (Institutional Capacity Development for Slum Upgrading): The Project will support institutional and policy development at national and county levels. Activities will include supporting the review of the 2005-2020 National Slum Upgrading and Prevention Strategy, the development of county-specific slum upgrading and prevention strategies, developing financing mechanisms for slum upgrading at county level, and developing strategies to plan for urban growth, prevent crime and violence and to ensure adoptive planning in informal settlements.

Component 4 (Program Management and Coordination): This component will finance activities of the NPCT and the CPCTs related to national and county-level project management and coordination, including planning, surveying, engineering, fiduciary (financial management and procurement), safeguards compliance and monitoring, monitoring and evaluation (M&E), and communication and community development.

E.5 Policy, Legal and Administrative Framework

The main legislation that governs environmental management in Kenya is the Environmental Management & Coordination (Amended) Act of 2015 typically referred to as EMCA. Environmental Management & Coordination (Amended) Act (EMCA) calls for environmental impact assessment (EIA) (under Section 58) to guide the implementation of environmentally sound decisions and empowers stakeholders to participate in sustainable management of the natural resources. Part V from Sections 42 – 57 deals with Protection and Conservation of the Environment while Part VI deals with Integrated Environmental Impact Assessment. Projects likely to cause environmental impacts require that an environmental and social impact assessment study to be carried out. It is under this provision that the current study has been undertaken because Legal Notice No, 32 and 34 of April 19, 2019 places the proposed interventions under the Medium-Risk Category requiring the preparation of a comprehensive project report.

The other policy legislation applicable to this project includes the, Kenya Vision 2030, the National Environment Action Policy (NEAP) 2013, National Land Policy, National Climate Change Response Strategy, 2010, The National Poverty Eradication Plan,, Water Act, 2016, Water Rules 2012, Penal Code CAP 63, County Government Act No. 17 of 2012, Occupational Health and Safety Act (OSHA 2007), The Kenya Roads Act 2007, Traffic Act, Chapter 403, Public Road and Road of Access Act Cap 399, Forest Act ,2016, The Kenya Road Act 2007, the Physical and Land Use Planning act 2019, The Public Health Act (CAP.242), Climate Change Act 2016, Employment Act, 2007, HIV and AIDS Prevention and Control Act 2011, Sexual and Gender

Based Violence (SGBV) of 2017, The National Museum and Heritage Act 2006, The Education Gender Policy, National Gender and Equality Act, Environmental and Land Court Act 2011, Child Rights Act (Amendment Bill) 2014, Work Injury Benefits Act (WIBA), Labor Relations Act 2012, National Gender and Equality Commission Act 2011, amongst others including Tharaka Nithi County Government Legislations and Policies.

In addition to the legislation, the World Bank Operational Safeguards policies that applicable to the project include: OP/BP 4.01 Environmental Assessment, OP/BP 4.04 Natural Habitats, OP/BP 4.10 Indigenous People, OP/BP 4.11 Physical Cultural Resources, OP/BP 4.12 Involuntary Resettlement, World Bank Policy on Access to Information 2010, World Bank Group Environmental, Health and Safety (EHS) General Guideline.

In addition to the legislation, the World Bank Operational Safeguards policies that applicable to the project include: OP/BP 4.01 Environmental Assessment, OP/BP 4.04 Natural Habitats, OP/BP 4.10 Indigenous People, OP/BP 4.11 Physical Cultural Resources, OP/BP 4.12 Involuntary Resettlement, World Bank Policy on Access to Information 2010, World Bank Group Environmental, Health and Safety (EHS) General Guideline.

E.6 Highlights of Stakeholder Consultations

Environmental Impact Assessment/Audit Regulations 2019 requires a project proponent to seek the views of persons/communities that may be affected by the project to be consulted, at least explain project potential impacts and obtain oral/written comments, which shall be included in the Environmental Social Impact Assessment (ESIA) for implementation by the proponent.

Key stakeholder meeting and a public baraza was held in September 2023 at Marimanti Social hall, to sensitize the members of the public about the proposed project, explain anticipated impacts and mitigation measures as well as get their views regarding the proposed interventions. Minutes of the meetings annexed (Annex 2).

E.7 Project Impacts

Assessment of project impacts was based on analysis of the proposed project components and existing environmental conditions. The impacts arising during each of the phases of the proposed development namely construction, operation and decommissioning, can be categorized into:

- Impacts on biophysical environment;
- Health and safety impacts; and
- Social-economic impacts

Sections E-7.1 to E-7.4 below provide a summary of the project impacts both positive and negative discussed in this report.

E-7.1 Positive Impacts

The project is envisaged to have positive impacts after completion of the civil works and commissioning. A summary of anticipated positive impacts of the Project include:

- **Employment opportunities:** With the construction of the proposed Project, there shall be employment opportunities for both professionals and unskilled workers, earnings from the wages shall improve their living standards. The workers shall include casual laborers, plumbers and engineers who are expected to work on the site for a period of time. Semi-skilled, unskilled laborers and formal employees are expected to obtain gainful employment during the period of construction. With labour intensive construction technologies, the project shall provide employment for youths and provide support to the GoK initiatives on creation of jobs. Employment opportunities shall also be of benefit in economic and social sense. Economic sense means, that abundant unskilled labor shall be used while social sense signify that the poor community shall be engaged in productive employment other than remaining idle and helpless which in most cases may translate to engagement in crime. Apart from casual labour, semi-skilled and skilled employees are also expected to obtain employment during the construction period. Employment opportunities shall also be of benefit in economic and social sense.
- **Creation of a market for construction materials-** The project will require materials, some of which will be sourced locally and some internationally.
- **Economic growth-** Through the use of locally available materials it will result in economic growth for the area.
- **Injection of money into the local economy-** A large sum of the project money shall be released into the local economy due to the construction activities
- **Creation of wealth-** The proposed project will ultimately provide revenues to the beneficiaries and expand the wealth base for the nation as a whole. Further, the value of land within the project area will rise thus improving on the existing wealth for the residents.
- **Improved well-being of women and children-** Water accessibility at homesteads would translate to time saving by the women. Time saved thus would be invested in other engagements that could bring financial benefits to the family. Children also bear the brunt of water borne diseases while women are tied down to provide nursing care to the sick family members

- **Reduced cases of water related diseases-** Cases of water borne disease in the project area areas are likely to reduce. This will effectively reduce related medical expenses among the poor people in the project area with extended long-term increased social productivity.
- **Improved well-being of women and children-** Water accessibility at homesteads would translate to time saving by the women. Time saved thus would be invested in other engagements that could bring financial benefits to the family. Children also bear the brunt of water borne diseases while women are tied down to provide nursing care to the sick family members.
- **Technology Transfer-** The project will be associated with technological and knowledge transfer to the local sector, this will be through the artisan who will be employed and trained by the Project.
- **Improved Health and Sanitation-** Good hygiene and sanitation standards are directly linked to provision of reliable and adequate water supply as well as provision of adequate sanitation facilities. The project target areas will directly benefit from improved hygiene and sanitation as a result of improved water supply networks including consumer connections
- **Security-** There will be enhanced security in the Marimanti arising from well-lit social, commercial and individual premises. With the implementation of the project, the level of security will increase across Marimanti. This is as a result of more security lights which helps keep off opportunistic crimes and gender based violence.
- **Improved road connectivity in Marimanti:** will not only open this settlement but it will also elevate and improve the livelihoods of the resident communities living in the settlement.
- **Improvement in gender parity:** It is envisaged that the upgrading of the road will improve availability and accessibility to social amenities, such as schools. Thus, women will have access to improved education facilities thereby enabling women to compete on an equal footing with men. The improved road will enhance service delivery including improved health services where the women will benefit greatly.
- **Economic and social value addition to the project's local area of influence-** There exists a close relationship between transport infrastructure and primary production (agriculture, animal husbandry, fishing, forestry and mining). Without transport access, much of primary production is not feasible. Availability of transport infrastructure attracts not only traders and transporters, but also agricultural, animal husbandry and other extension services. Equally important, improved access also impacts on education, health and other social services, which are essential for social and economic development.

- **Improved response to emergencies and humanitarian aid**- The improved road is expected to aid in rapid response to emergencies which will in turn save human lives and livestock. It will be possible to quickly deploy security officers to attend to any emergency.
- **Site Area Infrastructure:** The project is going to enhance development of project area infrastructure that is going to improve livelihood of the project area residents.
- **Environmental benefit:** proper disposal of waste shall result in positive environmental impact through reducing illegal dumping of waste by households and reducing the difficulty the county has to separately treat the waste according to its nature. In addition, management of waste through provision of bins will lead to reduced composition of waste within the settlement, which contributes to GHG emission which otherwise would emit CH4 to pollute the air.

E-7.2 Negative Impacts during construction phase and Recommended Mitigation Measures

Potential Impacts	Management Actions
	Environmental Impacts
Noise and excessive vibrations	<ul style="list-style-type: none"> • Contractor shall comply with provisions of Environmental Management Coordination Act (EMCA) (Noise and Excessive Vibrations) Regulations of 2009. • The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas; • Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity; • Undertake Noise and Vibration Assessments;
Air pollution and dust generation	<ul style="list-style-type: none"> • The contractor to comply the provisions of Environmental Management Coordination Act EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer; • Workers shall be trained on management of air pollution from vehicles and machinery. • All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications; • The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible

Potential Impacts	Management Actions
	<ul style="list-style-type: none"> The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds; Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust;
Vegetation Cover destruction	<ul style="list-style-type: none"> Reinstatement of the project sites to their original after completion of civil and road works All hedges damaged during construction to be reinstated after completion of the Works The contractor to adhere to the delineated construction work area. Planting of grass along the way leave and Pipeline friendly tree to be grown after construction
Generation of Solid waste	<ul style="list-style-type: none"> Maximum reuse of excavated material. Implementation of Soil erosion management in the spoil locations Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately Contractor's Camps and Construction Sites to have designated waste collection points,
Removal of vegetation	<ul style="list-style-type: none"> The contractor to adhere to the proposed soil conservation practices. Proper and compacted back filling. The contractor to stick to clear delineation of the construction to avoid vegetation loss. Planting of vegetation cover along the pipeline way leave Split compacted area to reduce runoff & re-vegetate where necessary Vehicles to be kept in designated access roads. Minimize compaction during stockpiling by placing soil in dry state Any polluted soil should be handled with care for proper disposal. Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills. Excavation materials to be stock piled at the demarcated location. Rehabilitation of the site after construction
Impact on soil	<ul style="list-style-type: none"> Storing of fuels, oils and chemicals beneath impermeable away from surface drains The machines to be properly serviced offsite and maintained to avoid spillage of effluents into the water bodies Water containing pollutants should be kept in a conservancy tank for removal

Potential Impacts	Management Actions
	<p>to prevent pollution of the surface water and surface water bodies.</p> <ul style="list-style-type: none"> Prompt action to be taken by the contractor in case of any pollution incident.
Accidental Oil and fuel Spills and Leaks	<ul style="list-style-type: none"> Checking and regular servicing of Equipment. Re-fueling at safe locations, Use of spill kits and applications of emergency spill procedures. Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and shall be replaced when saturated. Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.
Loss of temporary assets and sources of livelihood	<ul style="list-style-type: none"> No anticipated displacement was identified during social screening studies undertaken during the Environmental Social Impact Assessment (ESIA) Any displacement that may be identified during construction to be dealt with on case by case basis
Social Impacts	
Disruption of public utilities	<ul style="list-style-type: none"> Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works. Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services. Consultation and liaison with the various service providers shall be undertaken throughout the project life.
Increased Transmission of HIV/AIDS	<ul style="list-style-type: none"> Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Barazas. Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members Ensure safety of women and girls in provision of VCT services.
Human Rights Principles and Gender Inclusivity	<ul style="list-style-type: none"> Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. Comply to provisions of guidelines on incorporating Human Rights Standards and Principles, including Gender, in Programme Proposals for Bilateral German Technical and Financial Cooperation
Increased crime and insecurity	<ul style="list-style-type: none"> Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation.

Potential Impacts	Management Actions
	<ul style="list-style-type: none"> Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices
Increased Gender Based Violence	<ul style="list-style-type: none"> The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse The contractor shall implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: <ul style="list-style-type: none"> Effective and on-going community engagement and consultation, particularly with women and girls; Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. Ensure clear human resources policy against sexual harassment that is aligned with national law Integrate provisions related to sexual harassment in the employee Code Of Conduct Ensure appointed human resources personnel to manage reports of sexual harassment according to policy The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. The contractor shall ensure adequate referral mechanisms are in place if a case of Gender Based Violence at the community level
Sexual Exploitation and Abuse by project workers against community members	<ul style="list-style-type: none"> Develop and implement a Sexual Exploitation and Abuse action plan with an Accountability and Response Framework as part of the Contractor's Environmental Social Plan (C-ESMP). The Sexual Exploitation and Abuse (SEA) action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). The Sexual Exploitation and Abuse (SEA) action plan shall include how the project shall ensure necessary steps are in place for: <ul style="list-style-type: none"> ✓ Prevention of SEA: including Code of Conduct (COC) and ongoing sensitization of staff on responsibilities related to the Code Of Conduct (COC) and consequences of non-compliance; project-level IEC materials; ✓ Response to Sexual Exploitation and Abuse (SEA): including survivor-

Potential Impacts	Management Actions
	<p>centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management;</p> <ul style="list-style-type: none"> ✓ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights; • Management and Coordination: including integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.
Labour influx and sexual offences to minors	<ul style="list-style-type: none"> • Effective community engagement and strong grievance mechanisms on matters related to labour. • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination, and equal opportunity of workers.
Child labour and protection	<ul style="list-style-type: none"> • The contractor shall develop and implement a Children Protection Strategy that shall ensures minors are protected against negative impacts associated by the Project including Sexual Exploitation and Abuse (SEA). • All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior • Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 • Wherever possible, ensure that another adult is present when working in the proximity of children. • Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger. • Refrain from physical punishment or discipline of children
Health and Safety Impacts	

Potential Impacts	Management Actions
Risk of accidents at work site	<ul style="list-style-type: none"> Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls and helmets. Use of Personal Protective Equipment (PPE) to be enforced by the Supervising Engineer. Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles Isolate the site for access by the local communities during the construction for their safety and health Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public. Strict use of warning signage and tapes where the trenches are open and at other active construction sites
<ul style="list-style-type: none"> Traffic congestion Traffic related accidents 	<ul style="list-style-type: none"> The Contractor shall develop a traffic management plan; The Contractor should provide temporary road signs or notices to indicate ongoing works; The Contractor together with the Resident Engineer should Plan itineraries for site traffic on a daily basis and avoid peak traffic periods;

E-7.3 Negative Impacts during operation phase and Recommended Mitigation Measures

Potential Impacts	Management Actions
Social Impacts	
Risk of illegal connection and vandalism of the water pipeline	<ul style="list-style-type: none"> This shall require constant inspection by Nithi Water and Sanitation Company (NIWASCO) officials and installation of leak and burst detectors at designated areas along the pipeline. Conduct public sensitization programs on importance not interfering with the water pipeline and the need to seek official water connection from Nithi Water and Sanitation Company (NIWASCO)
Environmental Impacts	
Increased domestic wastewater generation	<ul style="list-style-type: none"> The client to consider construction of a sewerage system in the project areas.

Potential Impacts	Management Actions
Pollution of water and soils	<ul style="list-style-type: none"> Blockages should be detected and promptly replaced; Nithi Water and Sewerage Company to attend to burst pipes promptly to prevent excessive loss of soil; Provide high risk areas with appropriate drainage for effective channeling of burst sewage spills;
Risk of water pipeline bursts leading to water wastage	<ul style="list-style-type: none"> Regular check, repair and maintenance of the water pipeline Activate a community watch group for information sharing on the status of the water line Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas) The risk of pipeline bursts is low as the pipeline design, including the selection of pipe material and pipe pressure classes, has been carried out so as to minimize this risk. This risk shall be further minimized through regular inspection, repair and maintenance of the pipeline by the Operator, Nithi Water and Sanitation Company (NIWASCO)
Visual and landscape impact management	<ul style="list-style-type: none"> Elaborate landscaping and maintenance of these sites can limit the viewpoints to the facilities and thus reduce their visual impact.
Health and Safety Impacts	
Health and Safety Risks	<ul style="list-style-type: none"> Regular check, repair and maintenance of the water pipeline and sewer lines by Nithi Water and Sanitation Company (NIWASCO) officials. Activate a community watch group for information sharing on the status of the water line and sewer lines Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas) Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations. Carry continuous Public Health Awareness

E-7.4 Negative Impacts during decommissioning phase and Recommended Mitigation Measures

Potential Impacts	Management Actions
Environmental Impacts	
Solid Waste	<ul style="list-style-type: none"> All removed materials that shall not be used for other purposes must be

Potential Impacts	Management Actions
Generation	<p>removed and recycled/reused as far as possible;</p> <ul style="list-style-type: none"> Where recycling/reuse of the removed materials and other demolition waste is not possible; the materials should be taken to a licensed waste disposal site or arrangements made with the County Government; Donate reusable demolition waste to charitable organizations, individuals and institutions;
Noise pollution	<ul style="list-style-type: none"> Prepare a decommissioning plan to guide activities; Monitor noise levels as per the NEMA Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 & OSHA, 2007; The noise emission characteristics should be considered during selection and mobilization of decommissioning equipment; and Sensitize staff to switch off machinery and vehicles when not in use;
Health and Safety Impacts	
Occupational Health and Safety	<ul style="list-style-type: none"> Provide the correct Personal Protective Equipment (PPE) for the workers when conducting the demolition activities; Conduct training on health and safety procedures to the workers prior to commencement of demolition; Proper plans should be made prior to demolition so as to contain the raw sewage and other waste water that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it.

E.8 Environmental and social management and monitoring plan

An Environmental Social Management Monitoring Plan (ESMMP) has been developed whose pursuit can greatly improve the overall net effect of the project. This report observes that the bulk of adverse impacts will manifest at the construction stage in which case, the core effort in mitigation will be concentrated in the contract for construction. The contract for construction should bear clauses binding the contractor to implement impact mitigation as part of the civil works.

E.9 Findings

The following are the finding of the Environmental and Social Impact Assessment;

- The major positive impacts of this project will include improved health, air quality, employment opportunities, economic growth, technology and knowledge transfer, as well as mitigating related adverse impacts

- The project activities are likely to cause, albeit on a small scale, interruptions with traffic, risk of accidents, emission of dust, waste generation and increase in noise and vibration
- The study has proposed several measures to reduce negative impacts including amelioration of social negative impacts, noise abatement, waste management, reduction of soil erosion, and prevention of accidents and health hazards
- Monitoring has been identified as an important process in the protection of the environment of the project area since it will reveal changes and trends brought about mainly by construction activities

E.10 Recommendations

The Environmental Social Impact Assessment team recommends the following:

- All mitigation measures need to be specified in tender and contract documents and must be included in the engineering drawings, specifications and bills of quantities
- The Contractor will be required to prepare a Construction Environment & Social Management Plan (CESMP) which shall be approved by the proponent before the beginning of works
- Diligence on the part of the contractor and proper supervision by the project engineer during construction and the initial operation phase is crucial for mitigating impacts
- Contractor shall be required to commit to implementing the Environment, Social Health, and Safety (ESHS) Provisions by developing site-specific (ESHS) plans
- At project implementation stage, the Contractor to report to the project management team comprising of the Consultant and the project proponent on a monthly basis on how Environment, Social Health, and Safety (ESHS) provision detailed in this Environmental Social Impact Assessment are addressed
- The proponent should be given all the available support to implement the project
- Necessary permits should be issued by the licensing authority so that the work can commence such and National Environment Management Authority (NEMA) license, Directorate of Occupational Safety and Health (DOSH) permit, Business permit and any other relevant that may be required
- Periodic environmental and social monitoring is required by KISIP 2 team to ensure that mitigation measures have been implemented to prevent or avert any negative impacts of the project
- On completion of the road and Civil Works, KISIP 2, the proponent to commission an independent Consultant to undertake an initial Environment, Social, Health and Safety Audit as required by Environmental (Impact Assessment and Audit) Regulations 2003 with 2019 amendments.

- The audit shall identify nonconformities which the Contractor together with the Client shall address through the defect's liability period of the Project. This audit shall also form basis of annual Project self-audits by the Client.

E.11 Conclusion

The proposed project is environmentally, legally and socially acceptable. The potential significant environmental impacts can be adequately mitigated by the proposed measures and it is the responsibility of the proponent and all other actors to see to it that the measures are implemented. This way, the environmental threats will be downscaled to acceptable levels.

It is on the basis of the above, that it is recommended that the project be issued with the necessary clearance for the project to commence implementation.

CHAPTER 1: INTRODUCTION

1.1. Project Background

Government of Kenya received credit facility from the World Bank through International Development Association (IDA) and Agence Française de Développement (AFD) towards the cost of the Second Kenya Informal Settlements Improvement Project (KISIP 2) whose primary goal is to improve living conditions in informal settlements in selected towns in Kenya. The objective of the assignment is to prepare infrastructure upgrading plans, detailed engineering designs, procurement documents, resettlement action plan (RAP) and environmental and social impact assessment (ESIA) reports; and supervision of infrastructure construction works in selected informal settlements in Nyeri, Tharaka Nithi, Meru and Wajir Counties as shown in Figure 1-1.

A new approach is to support tenure regularization and infrastructure upgrading in the same communities through one integrated planning approach, aimed at saving both money and time and ensuring better coordination between the two interventions. In addition, the project will include activities to link vulnerable people (elderly, orphans, disabled, and others) of informal settlements to government programs aimed at reducing poverty and vulnerability, and to link at risk youth to programs focused on building skills and creating opportunities for employment and self-employment. KISIP 2 will include activities to prevent crime and violence.

The proposed project will comprise the following four components.

Component 1 (Integrated Settlement Upgrading):

KISIP 2 has built on the lessons learned from KISIP 2 and has combined tenure regularization and infrastructure into one integrated upgrading approach to save both money and time, ensuring better coordination between the two interventions in a settlement and deepening the project's overall impact on the participating communities by supporting tenure regularization and infrastructure upgrading in the same communities. Thus, two main interventions have been identified under this component: (i) tenure regularization; and (ii) infrastructure upgrading. Settlements will benefit from one or both interventions depending on the

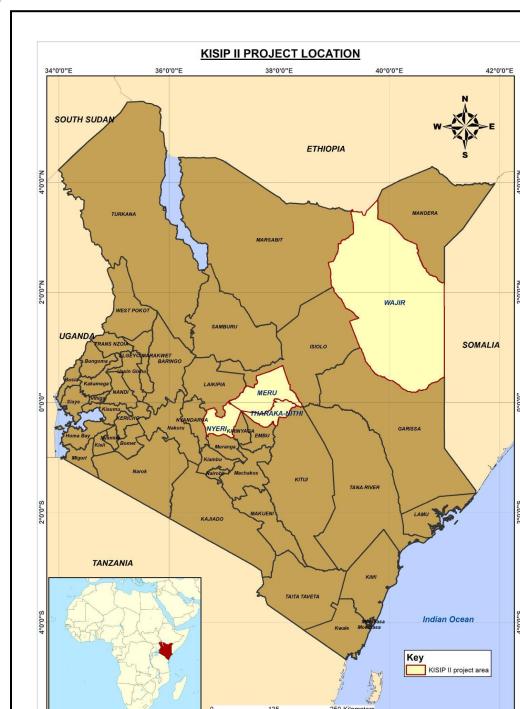


Figure 1-1: KISIP 2 Project Areas Locations

initial condition of the settlement. Under tenure regularization, KISIP 2 will support the chain of activities required to regularize tenure for people living on uncontested public lands. Based on experiences of KISIPII, the project will minimize displacement of residents in planning using 'adoptive' planning approach to minimize displacement of residents in informal settlements. Under infrastructure upgrading, KISIP 2 will support the same types of investments: roads, bicycle paths, pedestrian walkways, street and security lighting, vending platforms, solid waste collection and settlement sorting, storm water drainage, water and sanitation systems, public parks, and green spaces. The menu will also include investments related to prevention of crime and violence, including but not limited to community centers. Most of the infrastructure will contribute to climate resilience and the project will have substantial climate change adaptation and mitigation co-benefits.

Component 2 (Socio-Economic Inclusion Planning): This component will support the development of community-level socio-economic plans. The plans intend to identify together with the communities their socio-economic needs and then address how best the needs can be met.

Component 3 (Institutional Capacity Development for Slum Upgrading): The Project will support institutional and policy development at national and county levels. Activities will include supporting the review of the 2005-2020 National Slum Upgrading and Prevention Strategy, the development of county-specific slum upgrading and prevention strategies, developing financing mechanisms for slum upgrading at county level, and developing strategies to plan for urban growth, prevent crime and violence and to ensure adoptive planning in informal settlements.

Component 4 (Program Management and Coordination): This component will finance activities of the NPCT and the CPCTs related to national and county-level project management and coordination, including planning, surveying, engineering, fiduciary (financial management and procurement), safeguards compliance and monitoring, monitoring and evaluation (M&E), and communication and community development.

The Principal Secretary, State Department of Housing and Urban Development, Ministry of Lands, Public Works, Housing and Urban Development Second Kenya Informal Settlements Improvement Project (KISIP 2) has appointed Losai Management Limited in JV with Gath Consulting Engineers Ltd to provide Consultancy services for Infrastructure Upgrading Plans, Detailed Engineering Designs and Preparation of Procurement Documents and Construction Supervision of Infrastructure Improvement Works in Selected Informal Settlements in Nyeri, Meru, Tharaka-Nithi and Wajir Counties.

The Environmental Management and Coordination (Impact Assessment and Audit) Regulations, 2019 stipulates that either Comprehensive or Summary Environmental and social Impact Assessment (ESIA) Project Reports should be prepared for low and medium risk projects listed in the Second Schedule. The proposed project interventions in Marimanti Informal settlement falls in the category of medium risk projects under the Environmental Management and Coordination Act (amendment), 2019, thus a Comprehensive ESIA Project report is required. It is in response to this provision, that this report has been prepared

This is an Environmental and Social Impact Assessment (ESIA) Comprehensive Project Report (CPR) for the interventions proposed in Marimanti Informal settlement in Tharaka Nithi County.

The scope of construction works proposed for Marimanti informal settlement involves construction of:

1. Water
 - 3.3km OD50-OD90 HDPE Pipeline
 - 1. No. Elevated Water Tank
 - 150 household connections
2. 0.741 km of bitumen Road
3. 1.No ablution block

1.2. Project Justification and Benefit

The primary reason for upgrading the road in Marimanti informal settlement is to improve mobility and access within the settlement. The current state of the road (narrow) has continued to pose a great challenge to residents and other road users resulting in high production cost in terms of high vehicle operation cost and longer travel times. Upgrading of the road therefore would bring about improved economic benefit to the residents in this settlement. Further water reticulation with household connection will lead to improved heath and reduced water borne diseases.

1.3. Objectives of the Environmental Social Impact Assessment (ESIA)

1.3.1 General Objective

The Principal Secretary, State Department of Housing and Urban Development, Ministry of Lands, Public Works, Housing and Urban Development Second Kenya Informal Settlements Improvement Project (KISIP 2) is proposing to improve, water distribution, sewer network, road works and security lighting in Marimanti informal settlements in Tharaka Nithi County.

The main legislation that governs environmental management in Kenya is the Environmental Management & Coordination (Amended) Act of 2015 typically referred to as EMCA. EMCA calls

for Environmental Impact Assessment (EIA) (under Section 58) to guide the implementation of environmentally sound decisions and empowers stakeholders to participate in the sustainable management of natural resources. Part V from Sections 42 – 57 deals with Protection and Conservation of the Environment while Part VI deals with Integrated Environmental Impact Assessment. Projects likely to cause environmental impacts require an environmental and social impact assessment study to be carried out.

The proposed interventions require preparation of a comprehensive environmental and social impact assessment report because it belongs to the activities listed in Schedule II (3, c) water supply and distribution infrastructure and Schedule 11 (2, a) construction and rehabilitation of roads including collectors and access roads. The key purpose of the ESIA report is to ensure that the key environmental and social issues associated with the project are identified early enough so that the necessary mitigation measures are noted and integrated in the final project design. This ESIA CPR is part of the NEMA requirement and is expected to assist NEMA in decision making concerning the project licensing.

1.3.2 Specific Objectives of ESIA Investigations

This Environmental & Social Impact Assessment (ESIA) is expected to achieve the following objectives:

- i. To present existing environmental, social and cultural setting of the target project area;
- ii. To identify potential environmental and social impacts (direct and indirect), including opportunities for enhancement; this includes the cumulative impact of the proposed project and other developments which are anticipated;
- iii. To generate feasible alternative investments, sites, technologies, and designs;
- iv. To provide preventive, mitigating, and compensatory measures;
- v. To provide detailed results of the public consultation;
- vi. To prepare an Environmental and Social Management and monitoring Plan to mitigate the identified impacts so as to ensure sustainability of the proposed projects; and
- vii. To recommend cost effective measures to be implemented to mitigate against the expected impacts

1.4. Project Study Scope and Objectives

1.4.1 Project Objectives

The main objective of this proposed project is to improve access to basic services and tenure security of residents in participating urban informal settlements and strengthen institutional

capacity for slum upgrading in Kenya. This will be achieved by investing in infrastructure based on plans developed in consultation with the community, by supporting planning, surveying and issuance of land documents for residents of informal settlements, and by strengthening capacity of county administrations to deliver on their mandates.

1.4.2 Scope

The scope of services is limited to selected informal settlements in the four (4) counties. The assignment will be undertaken in two stages, and the scope of each stage is as outlined below:

Stage 1: Preparation of the Settlement Upgrading Plan, Engineering Designs, and Procurement Documents:

Stage 1.1: Preparation of Draft Settlement Upgrading Plans, Engineering Designs and Procurement Documents

This part of stage 1 includes:

- i. Community sensitization and consultation on the assignment;
- ii. Draft settlement upgrading plan, including feasibility studies and preliminary designs for the proposed infrastructure investments, including screening for potential environmental and social impacts, involuntary resettlement, and impacts on vulnerable and marginalized groups (indigenous persons) as per the screening checklists and guidance provided in the project's Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF), and Vulnerable and Marginalized Groups Framework (VMGF);
- iii. Environmental and Social Impact Assessment (ESIA);
- iv. Environmental Management Plans (ESMPs);
- v. Preliminary cost estimates;
- vi. Economic analysis of proposed investments;
- vii. Resettlement Action Plan (RAP) for the settlements; and Vulnerable and Marginalized Groups Plans, where applicable;
- viii. Draft procurement documents for each of the designed infrastructure, incorporating at minimum appropriate qualification requirements (technical and financial qualifications, personnel, financial resources, and equipment}), bills of quantities/scope of works, specifications, environmental and social requirements, drawings, conditions of contract, and draft construction works programme.

Stage 1.2: Preparation of Final Settlement Upgrading Plans, Engineering Designs and Procurement Documents

This stage will involve:

- i. Detailed engineering design;
- ii. Phasing plan for each county;
- iii. Operations and maintenance manuals for the proposed infrastructure;
- iv. Estimates of the proposed investments and operating costs, and
- v. Final procurement documents for the designed infrastructure incorporating at minimum appropriate qualification requirements {technical and financial qualifications, personnel, financial resources, and equipment}, bills of quantities/scope of works, specification, environmental and social requirements, drawings, conditions of contract and draft construction works programme. These procurement documents to be prepared shall be based on applicable World Bank's standard procurements and procurement regulations.

Stage 2: Construction Supervision:

This stage includes activities for quality control/assurance, time control, cost control and safety control.

1.5. ESIA Approach and Methodology

The ESIA was carried out in line with the provisions of the Environmental Management and Coordination 2015 and the Environmental (Impact Assessment and Audit) Regulations 2003 amended in 2019. An Environmental and Social Management Plan comprising of an impact mitigation plan and modalities for monitoring and evaluation was then developed to guide environmental management during all phases of project development. The assessment involved the following:

1.5.1 Literature Review

The Consultant reviewed literature related to the proposed project and the project area. These included project drawings, and other studies on physiography, geology, hydrogeology, water resources, and socioeconomics of the project area. Legislation, policies, and procedures including Constitution of Kenya, World Bank Operation safeguards County Integrated Development Plan, Kenya National Bureau of Statistics (KNBS), social and environmental management were also reviewed.

1.5.2 Environmental and Social Screening

Screening process was undertaken to decide whether the proposed interventions in Marimanti informal settlements needed to be subjected to an ESIA study or not. The Environmental Management and Coordination Act (EMCA) 2015 specifies the projects for which should be subjected to an Environmental and Impact Assessment (EIA) before commencement of project

activities. In this schedule, water supply and distribution infrastructure, waste disposal including distribution network and construction and rehabilitation of roads including collectors and access roads are classified under medium risk projects requiring preparation of ESIA Comprehensive Report consisting of the likely environmental effects before implementation.

Based on this classification, the proposed project was therefore subjected to an Environmental and social impact Assessment. Principal Secretary, State Department of Housing and Urban Development, Ministry of Lands, Public Works, Housing and Urban Development Second Kenya Informal Settlements Improvement Project (KISIP 2) herewith referred to as the proponent, appointed M/s Gath Consulting Engineers Ltd in JV with Losai Management Limited as a firm of expert to undertake the ESIA assessment and prepare an ESIA report in fulfillment of the EMCA 2015 and Environmental (Impact Assessment and Audit) Regulations, 2019.

1.5.3 Environmental and Social Scoping

Scoping process involved the identification of significant environmental and social issues associated with the proposed works. The impacts of the proposed project were assessed through project site visits and the following;

- Evaluation of the location, extent of the water connections and the current land use of the affected area;
- Evaluation of the design and proposed construction activities, materials and methodology;
- One on one interviews with key stakeholders and proposed project beneficiaries were applied in determining the location of pipeline, available way leaves especially in areas where there are no settlements and general opinions of the people; and
- Discussion with the area residents on the potential impacts related to project implementation activities and corresponding mitigation measures.

1.5.4 Baseline Data Collection

Baseline data were collected on the proposed project site and the area residents.

The data collected was on aspects such as topography, local flora and fauna, soils and geology, socioeconomics, existing and past activities including human settlements, local surface and groundwater resources, ambient air quality and noise levels (qualitative), waste management practices, and natural resources and cultural heritage aspects of the project areas.

1.5.5 Identification, Prediction and Determination of Environmental Impacts

A systematic approach was used to rank identified impacts according to their significance determined by consideration of project activity **event magnitude** and **receptor sensitivity**. The expected significance of environmental impacts was assessed considering:

- **Extent:** An area of influence covered by the impact. 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 shall be at location level (3) or could be County (5).
- **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 five categories according to this time period is zero, up to 1 year (short term), or more than two years, which are called respectively medium term (3), long-term (4), and permanent (5).
- **Intensity:** refers to the degree of impact on the factor, in the specific area in which it operates, ranked from low (1) to high (5).
- **Probability:** Refers to the likelihood of the impact occurring during the project implementation, this is also ranked as Probable (1) to highly probable.

Receptor Sensitivity determined by:

- **Presence** – whether biological species present are unique, threatened, protected or not vulnerable and are present during a period of high sensitivity (e.g. breeding, spawning or nesting). For human receptors, whether they are permanently present to uncommon in the area of impact and for physical features whether those present are highly valued or of limited or no value. For physical receptors/features, whether they are national or international value (e.g. state protected monument), local or regional value and is sensitive to disturbance or none of the above; and
- **Resilience** – how vulnerable people and/or species and/or features are to the change or disturbance associated with the environmental interaction with reference to existing baseline conditions and trends (such as trends in ecological abundance/diversity/status, ambient air quality etc.) and their capacity to absorb or adapt to the change. For physical receptors/features, highly vulnerable, undergoes moderate but sustainable change which stabilizes under constant presence of impact source or unaffected or marginally affected.

1.5.6 Stakeholder Consultations

Stakeholder consultations were carried out to: inform project stakeholders of the proposed project; to explain the likely impacts (positive/negative) of implementing the project; and to obtain views, concerns, comments and suggestions from interested and affected parties regarding the proposed project for use in ESIA preparation and finalizing the design report.

Key informants' interviews, administration of structured questionnaires and public meeting was held (Minutes and filled questionnaires are presented in Annex 2 & 4). Detailed outcome of consultation including stakeholders interviewed is discussed in Chapter 6 of this report.

Table 1:1: List of KII consulted

Name	Designation
Elijah Sironka	Assistant County Commissioner
Raffina Kathure	Urban Planner
Moses Muriithi	Surveyor
Rev George Mwabu	SEC chairman
John Muchiri	Senior Chief
Charles Munene Nyaga	Town Administrator

Table 1:2: List of Participants

Meeting Date- September 28,2023	
List of participants	Number
Male	6
Female	9
Total participants	15

CHAPTER 2: PROJECT DESCRIPTION

2.1 Existing Water Supply Condition

Marimanti settlement mainly sources its potable water from the NIWASCO distribution network. The settlement also gets its water from a community water supply project that sources from a river intake. The area is served with OD 75-OD 50 uPVC pipes within the settlement.



2No 5000-Litre water tanks at Existing concrete pipe culverts
Marimanti Stadium

Figure 2- 1: Existing water infrastructure in Marimanti

Source: Photographs taken by Consultant during site visit.

2.2 Existing sanitation condition

The settlement has no sewerage system. It mainly uses pit latrines for their sanitation as no sewer reticulation has been constructed.

The community is highly reliant on disposal of human waste through pit latrines but newer structures have installed septic tanks and soak away pits



Grey water discharge at Marimanti



Ablution block at Marimanti market

Figure 2- 2: Existing Sanitation facilities

Source: Consultant 2023

2.3 Existing Road Condition

The existing roadway consists of both bituminous and gravel sections, maintaining a road reserve width within the desired range of 7 to 10 metres. The horizontal alignment incorporates gentle curves and straight segments, linking with the pre-existing Marimanti Market Road within the project zone. Additionally, the road traverses a terrain transitioning from flat to rolling, featuring gradients of up to 7%. The settlement has roads of approximately 1.12 km.

The existing drainage system in the settlement is minimal, with limited cross-pipe culverts at junctions with earth drains and no cross culverts at other junctions. To optimize drainage without causing negative impacts, our road design will integrate additional culvert crossings and substantial upgrades to the side drains for improved drainage efficiency.



Figure 2- 3: Existing Road Reserve

Source: Consultant 2023

2.4 Solid Waste Management

The County has invested extensively in the provision of solid waste bins. In Marimanti, bins are emptied daily and the County tipper transport the waste to Marimanti waste management site.

2.5 Proposed water interventions

2.5.1 Water Pipelines

The area is currently covered with reticulation water pipelines of uPVC. The current infrastructure is dilapidated extensively with many points of repairs being evident. The Consultant recommends the use of HDPE pipes to ensure longevity and reduce maintenance costs. The pipe sizes range from OD 90 to OD 50 totaling to about 3.3km of pipeline. The pipes will be butt fussed and pressure tested to inspect for leaks.

The major works shall involve laying of 3.3 km of OD 50 to OD 90 pipelines. Further, there are chambers to be cast in situ to house air valves, washouts and gate valves along the pipeline routes.



Figure 2- 4: Proposed Water Network (Source: Consultant Design Reports)

2.5.2 Elevated Water Tank

As per the water demand estimates, the area has a current demand of 400m³/day and an ultimate demand of 700m³/day. The area currently experiences water shortages due to water rationing by the WSP on particular days and also experiences reduced pressures during peak flow. To counter this problem, the Consultant has designed a 75m³ reservoir to serve the settlement. The elevated reservoir will ensure that the peak demand does not reduce water pressure while also ensuring enough storage to serve the residents during the rationing period.

The tank and water distribution will be managed by the WSP. The tank will primarily serve the informal settlement. Given its proposed elevation, it has the potential to serve a larger area beyond the settlement.

2.5.3 Individual Connections

The settlement was demarcated during the KISIP 2 project with a total of 150 plots within the settlement. A connection of each plot is recommended with an individual meter for easier monitoring of consumption levels.

2.5.4 Fire Hydrant

Informal settlements are prone to extensive damage once fire breaks out due to the choice of construction material and closeness of the structures. To counter this situation, 3 No fire hydrants have been proposed within the settlement.

2.6 Proposed sanitation intervention

This design recommends the construction of a new ablution block within the settlement. The ablution block will be located at the social hall compound. The facility will have a plinth area of 25.8m² with segregated facilities for both gents and ladies. The facilities will have 2No. Pour flush toilets and 1No shower for each of the genders. The facility will be served by 2No. 5000 Liters water tanks placed on the roof slab of the block.

A layout of the ablution block shown in figure 2-5.

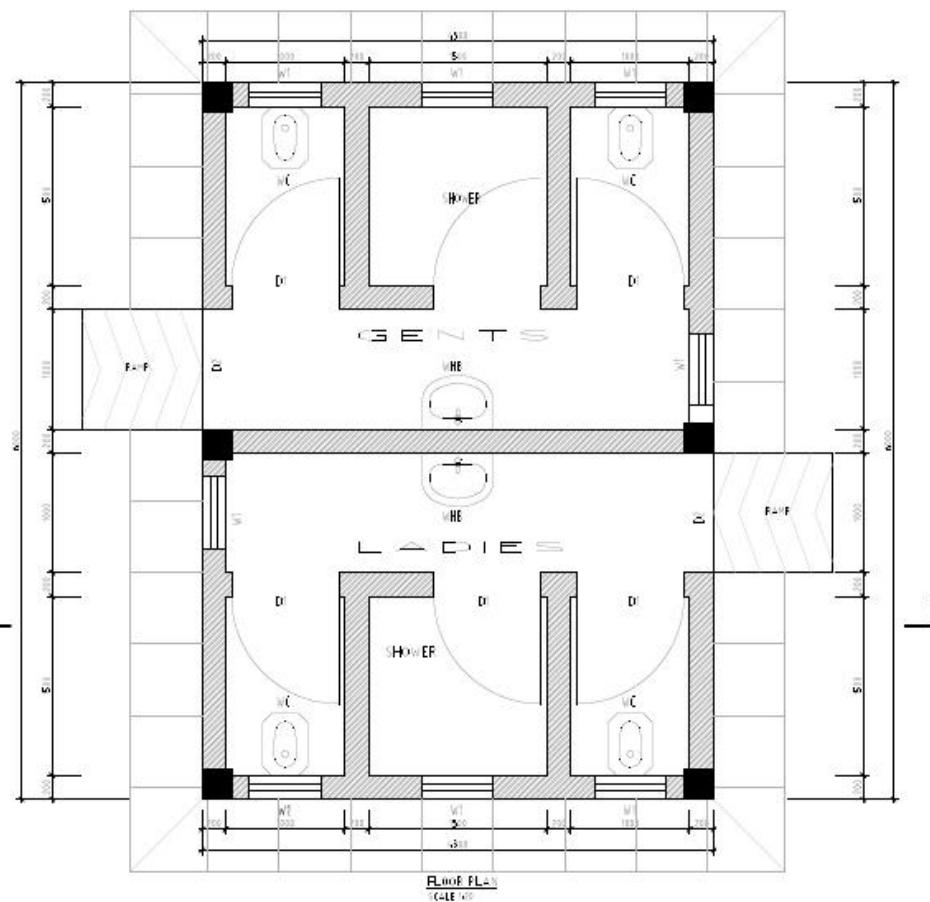


Figure 2- 5: Typical layout of ablution block (Source: Consultant Design Reports)

2.7 Proposed Road Network

The works will constitute upgrading to bitumen standards of 0.741 km long roads that serve residential areas and social amenities within the informal settlements. The major works to be executed under the Contract comprise mainly of but are not limited to the following:

- i. Site clearance;
- ii. Earthworks to formation level;
- iii. Regular maintenance of passage of traffic during construction including diversion works as necessary to meet regulatory requirements;
- iv. Pavement Construction as follows:
 - a. Fill with suitable material to formation level
 - b. Construction of a 300mm improved Subgrade layer to 100% MDD
 - c. Provide and process 250mm thick layer of neat gravel sub-base layer
 - d. Provide, spread and Compact 150mm of cement stabilized base layer
 - e. Provide, spread and Compact 50mm thick Asphalt Concrete Type 1(0/14mm) as wearing course
- v. Footpath:
 - a. Provide, spread and Compact 150mm thick neat gravel base to walkways (where applicable)
 - b. Provide, spread and Compact 50mm quarry dust
 - c. Provide 60mm paving blocks
- vi. Construction of drainage and protection works;
- vii. Road furniture;
- viii. Identification and relocation of services;
- ix. Maintenance of passage of traffic through the work; and
- x. Any other activity not listed above but may be deemed necessary and instructed by the Engineer

2.8 Proposed project activities

2.8.1 Project Mobilization & Construction Phase

The mobilization and construction phase will take place subsequently to the issuing of Environmental Impact Assessment Certificate, building/construction permits and once a construction contract with a suitable contractor is signed. The mobilization and construction phase will involve different activities as summarized below:

- Site clearance, earthworks and construction of ablution block and elevated
- Installation of temporary security fence at the ablution block and elevated tank

- Acquisition of materials from a reliable sources and storage;
- Testing of the construction materials;
- Acquisition of other permits such as water use permits;
- Confirmation of data and accuracy of topographical survey;
- Mobilization of labour force, equipment and plant for construction works;
- Transportation of equipment, workers, materials and storage;
- Abstraction and transportation of water to the construction site;
- Collection, storage, transportation and disposal of waste
- Actual construction works; Trenching, walling, plastering, roofing, painting
- Movement of heavy equipment and machines
- Occupational health and safety management;

2.8.2 Campsite and Mobilization of workers

The Contractors' campsite will be temporary in nature (for the duration of the construction phase) and will include site offices, laboratory and other temporary facility for the contractor. It will be located within project site area. Once the location of the campsite is determined, the contractor will have to comply with ESMF requirements including developing site specific environmental and social management plan (ESMP) for prevention, minimizing and mitigating likely impacts including gender-based violence. The campsite area will thereafter be rehabilitated (i.e. returned to its preconstruction condition) at the end of the construction phase. All efforts will be made to ensure that all construction work will be undertaken in compliance with local and national legislation, local and international best practice, as well as the Environmental and Social Management Plan (ESMP), which is included in this ESIA Report. During the construction phase, both skilled and unskilled temporary employment opportunities will be created. It is difficult to specify the actual number of employment opportunities that will be created at this stage; however approximately over 100 direct and indirect employment opportunities are expected to be created during the construction phase at each site. It should however be noted that employment during the construction phase will be temporary, whilst being long-term during the operational phase.

2.8.2.1 Equipment and machinery requirements

Use of heavy construction equipment is expected for this project. At construction phase the project will employ various types of construction equipment and machineries for successful implantation of project activities.

2.8.2.2 Delivery of equipment and machineries

All construction equipment and machineries will be delivered by specialized trucks. They will use the existing Road network in Marimanti. It will be the responsibility of the contractor to take necessary measures to ensure safety for the community and workers this includes proper scheduling delivery and obtain appropriate transportation and safety permits.

2.8.2.3 Storage at Campsites

Sites will have specific storage area for materials that are sensitive to weather. The Contractor shall have a material data sheet to show all the records of material on or leaving the site. Materials such as cement and oil will be stored in the campsite. Other materials, such as sand, stones, aggregates etc., will be stockpiled at the site. Hazardous materials such as explosive and inflammable will not be stored at the campsite unless special measures are taken and permit issued by the authority. Refuelling for some equipment such as compactors and generators will be done on site whereas for vehicles and trucks will be done outside the project area in existing fuel stations in Marimanti.

2.9 Mainstreaming Climate Resilience in Infrastructural Projects

As part of our commitment to promoting climate resilience and sustainability in infrastructure development, the design of the Infrastructural Projects has been done in alignment with existing design standards and codes, factoring in Climate Resilience aspects. These parameters are engineered to enhance the low carbon footprint while addressing the unique environmental, economic, and social challenges of the region.

A. Water

The Water component has been designed using the Ministry of Water and Irrigation (MWI) Practice Manual for Water Supply Services in Kenya, 2005 edition. Further reference has been made from the following generally acceptable sources: WHO Report No. 4- Design and Selection Criteria for Communal Water Supply (1972); and IRC for Community Water Supply and Sanitation – Technical Paper Series No. 18. Climate change resilience has been factored as:

- (i) **Pipeline Material and Depth:** Given the current varying terrain of the project area which makes it prone to soil erosion especially during flash floods, high-density polyethylene (HDPE) pipes have been recommended due to their durability and resistance to corrosion;
 - a. The depth of pipelines is within the recommended limit in the water design manual to safeguard against exposure and damage from surface run-off;
 - b. A minimum pipe slope of 0.2% has been considered to prevent siltation in pipes during high intensity rainfall;

- c. 150mm thick mass concrete surround has been provided to maintain alignment and structural integrity of the pipes- This ensures the pipes are not destroyed or dislodged from erosion caused by flowing water, abrasive sediments, or shifting soil during high intensity rainfall;
- d. At road crossing, adequate fittings, sleeves and anchor blocks have been provided to protect the pipes from being destroyed during high intensity rainfall;

(ii) **Adequate Storage Capacity:** Given the prolonged drought periods in the County, the design has factored in provision of adequate storage tanks to conserve water for use during dry spells. For the 75m³ proposed elevated steel tanks, adequate anchorage has been provided to mitigate against wind effects;

(iii) **Control Valves:** The pipeline has been designed incorporating strategic location of control valves to enhance water rationing during the dry spells;

(iv) **Washout Valves:** The pipeline has been designed incorporating strategic location of washout valves for flushing of pipelines in case there is penetration of storm water and soil sediments during high intensity rainfall;

(v) **Water Conservation:** Given the limited water resource, the design has incorporated provision of water connections to ensure customers are conserving water for use during dry spells and ensure continuity of supply to customers on the downstream areas;

- a. Proper meter chambers have been provided with lockable concrete covers to prevent damage of meters by storm water during high intensity rainfall;
- b. The type of water meters provided has also considered the expected climate change patterns in the project areas to ensure high accuracy at all times

Generally, the design has incorporated climate informed design principles from the Ministry of Water and Irrigation (MWI) Practice Manual.

B. Structures

The design of structures has been done in alignment with the Euro codes and British standards provided to enhance their resilience to wind, temperature and earthquakes:

- Eurocode 1- resilience of structures to wind and temperature;
- Eurocode 7- geotechnical investigation and designs;
- Eurocode 8- earthquake resilience;
- BS 8110 part 1-1997- structural use of concrete;
- BS 5925 -code of practice for ventilation principles and designing for natural ventilation; and
- BS 5268- structural use of timber.

Given the prolonged heat stress in the areas, proper roofing materials have been considered; adequate natural ventilation has been provided to increase resilience in extreme heat; and engineered joints in concrete have been considered to allow for concrete expansion and contraction due to temperature.

Due to the common flash floods within the area, the design has given an allowance for disposal of the rain water and drainage system to drain off the flood water.

C. Street Lighting

Lighting will be provided in line with the Street Design Manual for Urban Areas in Kenya and the Kenyan Building Code. The spacing between two light poles should be approximately three times the height of the fixture. Seismic, wind and flood components have been incorporated in the design.

- a. **Proper Selection and Installation of Poles:** Steel poles will preferably be used and adequate foundation depths provided to mitigate against wind and flood effects;
 - Stainless steel and rust resistant paint will be used to prevent corrosion of the light pole;
- b. **Power Source:** Given the prolonged dry periods in the area, the street lighting has been designed to utilize the renewable solar energy with adequate battery capacity having a positive impact on greenhouse gas emissions. An allowance for connection to mains back up has been provided incorporated in the design for use during the rainy days considering 3-7 cloudy/rainy days;
- c. **Adaptive Lighting Controls:** Adaptive lighting controls including motion sensors, light control and time control have been incorporated in the design to ensure optimal energy usage. This will enhance energy efficiency by adjusting light levels based on ambient light conditions and pedestrian or vehicular traffic patterns;
- d. **Energy Efficient Technologies:** Energy efficient technologies including Light Emitting Diodes (*LED: 240w with Bridgelux/CREE/Philipsled chips 3030, 160-170LM/W, 6000K ~6500K (customized 2700k-6500k)*) have been incorporated in the design to enhance energy consumption and reduce greenhouse gas emissions.

D. Roads

The road design has been in alignment to required road design manuals and standards incorporating climate projection. Recommendations from Street Design Manual for Urban Areas in Kenya (SDMUAK) on provision of green infrastructure on the urban roads environment have been provided so that road surfaces will have shade and support interception and infiltration of rainfall. The road designs incorporate several key parameters aimed at reducing the carbon footprint and enhancing environmental sustainability:

- I. **Site Access and Sustainability:** Site clearance will be carried out within the road corridor boundaries, ensuring that trees and vegetation outside this designated area remain undisturbed. Additionally, the project includes plans to plant trees along the corridor. This initiative aims to offer shade, enhance air quality, and contribute to carbon sequestration, aligning with environmental sustainability goals.
- II. **Road Width:** The variable width from 4.5m to 5.5m is designed to cater for local traffic demands while minimizing land use and disturbance to the natural environment. This careful balance ensures that the roads are sufficient for community needs without excessive deforestation or land degradation.
- III. **Drainage Systems:** The design includes both U-Drains and Trapezoidal Drains, with some sections featuring a concrete-covered U-Drain that doubles as a footpath. This innovative use of space ensures effective water management while providing safe pedestrian pathways, reducing the need for separate infrastructure and thus lowering the environmental impact. For the drainage systems in both Marimanti and Kathwana settlements, a standard design featuring a 1-meter-deep drain was implemented across the board, lined with A142 BRC MESH. This design was consistently applied even in areas where minimal stream nodes (<1) suggested small watershed catchments typically suited for shallower drains. The choice to standardize the drain depth allows for a uniform approach to storm water management, potentially offering greater resilience to unexpected heavy rainfall and providing a buffer for future climate variability. To further ensure the durability and resilience of road infrastructure in response to climate variability, 900mm standard pipe culverts are incorporated into the design. These culverts are essential for facilitating the swift and effective passage of storm water, particularly crucial during heavy rainfall events, which are expected to increase in frequency and intensity due to climate change. The culverts prevent road surface erosion and reduce the risk of flooding, both of which can cause significant damage to the road infrastructure and surrounding ecosystems.
- IV. **Concrete Kerbs and Channels (100mm x 200mm):** The adoption of locally sourced concrete for the construction of kerbs and drainage channels significantly minimizes transportation-related emissions and bolsters the local economy. These concrete structures play a pivotal role in water management by channeling runoff effectively, thus preventing erosion alongside the roads. This strategic intervention not only diminishes the frequency of required road maintenance but also contributes to a reduction in the carbon footprint associated with such upkeep activities.
- V. **Pavement Structure:** The engineered multi-layer pavement structure is composed of a 50mm Type II asphalt concrete, a 150mm layer of cement-improved gravel, a 255mm

subbase, and a robust 300mm subgrade. This optimizes durability and minimizes the frequency of maintenance. By enhancing the bearing capacity of the layers where needed, and substituting with superior materials as required, the design ensures a longer lifecycle for the road. Project roads in both Kathwana and Marimanti settlement have sections of subgrade class S1 and S2 that need be improved to achieve a new bearing strength of S3. The improved subgrade for the project roads is guided by RDM III manual. Alternatively, sections of subgrade class S1 and S2 can be excavated and replaced with suitable borrowed gravel of minimum class S3. This thoughtful approach not only conserves resources but also diminishes the environmental impact that often accompanies road repair and maintenance operations. Through these enhancements, the pavement structure stands as a paragon of sustainability, contributing to a reduced carbon footprint.

VI. **Locally Sourced Materials:** The commitment to using materials sourced from the local area like Kithiori and Kanjuki reduces carbon emissions related to transport while supporting local industries. This approach also ensures that the materials are suitable for the local environment, improving the longevity and sustainability of the road infrastructure.

VII. **Community Engagement:** We worked closely with local communities to ensure that the resulting infrastructure met high standards of quality and was tailored to the community's needs and sustainability objectives. Through a series of community engagement workshops, valuable local knowledge was gathered, informing the design process with insights into regional weather patterns and ecological considerations. This collaborative approach promoted a sense of community ownership over the project, vital for its enduring maintenance and viability. The dedication to this inclusive strategy led to the creation of a road system that not only enables safe and efficient transport but also advances sustainable development in the region.

2.10 Project Cost

The total cost for the project is approximately Ksh. 141,995,212.42 as shown in Table 2-1.

Table 2:1: Project Cost

No	Marimanti	Detailed Description	Cost (Ksh)
1.	Preliminary and general items		10,994,527.58
2.	Water supply	<ul style="list-style-type: none"> 3.3km OD50-OD90 HDPE Pipeline 1No. Elevated Water Tank 150 household connections 	4,447,150.33
3.	Sanitation	1No. Ablution Block	6,565,349.00

No	Marimanti	Detailed Description	Cost (Ksh)
4.	Roads	0.741km of Roads	57,878,332.52
5.	Day works	Day works roads	2,161,155.00
6.	Environmental	Environmental and social safeguards	9,235,000.00
BILL TOTAL EXCLUSIVE OF VAT			111,281,514.43
ADD 10% CONTINGENCY			11,128,151.44
BILL TOTAL INCLUSIVE OF CONTINGENCY			122,409,665.88
ADD 16% VAT TAX			19,585,546.54
BILL TOTAL INCLUSIVE OF VAT AND CONTINGENCY			141,995,212.42

(Source: Project BoQ)

DISCLOSURE

CHAPTER 3: ENVIRONMENTAL AND SOCIAL BASELINE CONDITION

3.1 Introduction

Baseline conditions entail the sum-total of all biophysical and geo-physical condition of the project area. Gathering of baseline data is necessary to meet the following objectives:

- To understand key social, cultural, economic, and political conditions in areas potentially affected by the proposed project;
- To provide data to predict, explain and substantiate possible impacts;
- To understand the expectations and concerns of a range of stakeholders on the proposed development;
- To inform the development of mitigation measures; and
- To benchmark future socio-economic changes/impacts and assess the effectiveness of mitigation measures.

3.2 Geographical characteristic of the project area

3.2.1 Overview of Tharaka Nithi County

Tharaka-Nithi County is one of the forty-seven (47) counties in Kenya created by the Constitution of Kenya, 2010. It is located in Kenya's former Eastern Province and a home to the Chuka, Muthambi, Mwimbi and Tharaka people of the larger Ameru (Amiiru) community. The minority being Akamba, Ambeere and Aembu; all from the neighboring counties.

Tharaka Nithi County borders the counties of Embu to the South and South West, Meru to the North and North East, Kitui to the East and South East while sharing Mount Kenya with Kirinyiga and Nyeri to the West. The county lies between latitude $00^{\circ} 07'$ and $00^{\circ} 26'$ South and between longitudes $37^{\circ} 19'$ and $37^{\circ} 46'$ East. The total area of the County is 2,662.1 Km²; including 360Km² of Mt Kenya forest in the county. Figure 3-1 shows the location of Tharaka Nithi County within the map of Kenya. (CIDP 2018-2022).



Figure 3- 1: Location Map of Tharaka Nithi County

Source: Tharaka Nithi CIDP

3.2.2 Demographic Features of Tharaka Nithi County

3.2.2.1 Population Size, Composition and Distribution

The demographic features of a population are a crucial statistical basis for development planning. Examples of demographic characteristics include age, race, gender, ethnicity, religion, income, education, home ownership, sexual orientation, marital status, family size, health and disability status, and psychiatric diagnosis. The population structure of a given region is thus defined by the different characteristics that a population can be broken up or distributed.

3.2.2.2 County Population Structure by Sub County

Segregation of population according to the age groups is important in determining the numbers of the different groups to determine the necessary policies to address their needs. Table 3-1 gives a summary of the population of the county by sex and Sub County.

Table 3:1: population projection (by sub-county and sex)

Sub-county	Census (2019)				2022 (Projection)			Projection (2025)			Projection (2027)		
	M	F	Inter-sex	T	M	F	T	M	F	T	M	F	T
Igambang'ombe	26,464	26,745	1	53,210	27,024	27,311	54,334	27,595	27,888	55,483	27,983	28,280	56,263
Maara	57,689	57,205	0	114,894	58,909	58,415	117,324	60,155	59,650	119,805	61,000	60,488	121,488
Meru South	44,923	46,155	2	91,080	45,873	47,131	93,004	46,843	48,128	94,971	47,501	48,804	96,305
Tharaka North	28,290	30,053	2	58,345	28,888	30,689	59,577	29,499	31,338	60,837	29,914	31,778	61,691
Tharaka South	36,190	39,058	2	75,250	36,955	39,884	76,839	37,737	40,727	78,464	38,267	41,300	79,567
Mt. Kenya Forest	208	190	0	398	212	194	406	217	198	415	220	201	421
Total	193,764	199,406	7	393,177	197,861	203,624	401,484	202,046	207,929	409,975	204,885	210,851	415,735

(Source KNBS 2019)

The county had a total population of 393,177 comprising 193,764 males, 199,406 females and 7 inter-sex as determined by the 2019 population and housing census. This is projected to be 401,484 in 2022 (197,861 males and 203,624 females), 409,975 in 2025 (202,046 males and 207,929 females), and 415,735 by 2027 (204,885 males and 210,851 females). The County's annual population growth rate is 0.75%.

The population distribution by sub county indicates that as per the 2019 census Maara Sub-county had 114,894 (57,689 males and 57,205 females), Meru South had 91,080 (44,923 males, 46,155 females and two intersex), Igamba Ing'ombe had 53,210 (26,464 males, 26,745 females and one intersex), Tharaka South had 75,250 (36,190 males, 39,058 females and two intersex), Tharaka North had 58,345 (28,290 males, 30,053 females and two intersex) while those living in the Mt Kenya were 398 (208 males and 190 Females).

3.2.2.3 County Population Structure by Age

The age structure of a population refers to the proportionate numbers of people in different age categories in a given population for a defined time. It is a natural characteristic of a population in a country or a region. The age structure is closely related to the birth rate, death rate and migration of a population. Table 3-2 gives a summary of the population of the county by selected age groups and sex

3.2.2.4 Population Projections by Age Cohort

Table 3:2: Population Projections by Age Cohort

Age Cohort	2019 (Census)			2022 (Projection)			2025 (Projection)			2027 (Projection)		
	M	F	T	M	F	T	M	F	T	M	F	T
0-4	20,169	20,215	40,384	21,125	21,836	42,961	21,111	21,840	42,951	20,767	21,481	42,248
5-9	21,714	21,488	43,202	20,869	21,111	41,980	21,030	21,967	42,997	21,023	21,970	42,992
10-14	24,240	23,884	48,124	20,499	20,061	40,560	20,631	20,411	41,041	20,740	20,984	41,724
15-19	21,548	21,153	42,701	19,606	19,621	39,228	20,025	19,549	39,574	20,117	19,783	39,901
20-24	15,386	16,256	31,642	18,815	18,990	37,806	18,798	19,124	37,923	19,072	19,083	38,155
25-29	13,060	13,789	26,849	17,936	17,964	35,900	18,241	18,286	36,527	18,240	18,385	36,625
30-34	13,294	14,618	27,912	15,314	15,386	30,700	17,217	17,253	34,470	17,421	17,471	34,893
35-39	12,140	12,283	24,423	12,814	13,361	26,175	13,555	13,702	27,257	14,787	14,919	29,706
40-44	10,749	10,499	21,248	11,563	12,326	23,889	11,796	12,624	24,421	12,278	12,854	25,133
45-49	9,895	10,095	19,990	10,437	11,130	21,567	10,825	11,535	22,539	10,978	11,736	22,714
50-54	7,012	6,737	13,749	8,082	8,821	16,903	9,534	10,257	19,792	9,782	10,526	20,307
55-59	6,864	7,050	13,914	6,289	6,642	12,931	6,506	7,367	13,873	7,407	8,281	15,688
60-64	5,531	5,576	11,107	5,239	5,439	10,678	5,426	5,715	11,140	5,561	6,175	11,736
65-69	4,345	4,848	9,193	4,268	4,551	8,819	4,252	4,830	9,082	4,369	5,002	9,371
70-74	3,365	4,295	7,660	3,783	4,256	8,039	3,269	3,942	7,210	3,281	4,114	7,395
75-79	1,780	2,303	4,083	2,489	3,000	5,489	2,808	3,888	6,696	2,596	3,708	6,304
80+	2,667	4,312	6,979	3,688	4,642	8,330	3,296	4,628	7,924	3,313	5,152	8,465
Age NS	5	5	10	0	0	0	0	0	0	0	0	0
Total	193,764	199,406	393,170	202,817	209,140	411,956	208,321	216,917	425,238	211,734	221,623	433,357

(Source KNBS 2019)

From 2019 census of the age cohorts, the population below 19 years comprised of 174,411 (44 %), for the age group of 20-59 years were 179,727 (49 %) while those of 60 years and above were 39,022 (7%) of the total population. A large footed pyramid base indicates that Tharaka Nithi County is dominated by a youthful population. Infants (0-4 years) make up 10% of the population. Primary going children (5-14 years) make up 23%, while the youth (15-24 years) make up 19% of the population. Additionally, an estimated 34% of the total population is below 14 years and about 66% of the population is below 35 years. This is in contrast to the elderly population (65 years and above), which makes up 7% of the total population. This is summarized in Table 3-2 above.

The age structure indicates that the county has a massive youth demographic which requires a comprehensive development plan to address diverse current and future needs. To support the dependent population, basic interventions in the social sectors of health, education and nutrition need to be implemented to create more employment opportunities especially for the youth. The female/male sex ratio for the county is 97: 100 which conforms to that of national level.

The dependent population makes up 52% of the total population whilst the working population makes up the remaining 48%. This gives a dependency ratio of 1.1, meaning there are more residents depending on others. However, having a large youthful population is one strength the County can use to achieve growth and development as they make up the working-class population. Strategies that improve social sectors such as health, education, and nutrition will ensure the young and old population is well catered for.

3.2.2.5 County Population of the Urban Centres

The share of the urban population has been increasing in the recent past and this is expected to grow exponentially over the next decade.

Table 3:3: Population Projection by Urban Area

Urban Area	Census (2019)			2022 (Projection)			Projection (2025)			Projection (2027)		
	M	F	T	M	F	T	M	F	T	M	F	T
Chuka	10,902	11,476	22,378	13,355	14,059	27,414	16,361	17,222	33,583	18,732	19,718	38,450
Chogoria	3,744	3,859	7,603	4,587	4,727	9,314	5,619	5,791	11,410	6,433	6,630	13,063
Marimanti	1,393	1,365	2,758	1,706	1,672	3,379	2,091	2,048	4,139	2,393	2,345	4,739

(Source KNBS 2019)

Chuka town is the most populated town with 22,378 residents in 2019 and is expected to reach 38,450 by year 2027. Chogoria town had a population of 7,603 in 2019 and is projected to be 13,063 by the year 2027. Marimanti had a population of 2,758 in 2019 and is expected to increase to 4,739 by year 2027. All towns serve as Sub County headquarters, and this has immensely contributed to their fast growth. Marimanti Municipality is expected to grow fast in the coming years. These towns are expected to attract more migrants in search of employment and business opportunities. This will increase demand for social amenities such as housing, sewerage systems, water services, healthcare centers, car parks and other facilities.

3.2.2.6 Population Density and Distribution

This section presents population density and distribution in the county.

Table 3:4: Population distribution and density by sub-county

Sub0 County	Area (KM ²)	2019 (Census)		2022 (Projection)		2025 (Projection)		2027 (Projection)	
		Population	Density	Population	Density	Population	Density	Population	Density
Igamba ng 'ombe	324.6	53,210	164	55,751	172	57,549	177	58,648	181
Maara	265.1	114,894	433	120,382	454	124,263	469	126,635	478
Meru South	138.8	91,080	656	95,430	688	98,507	710	100,388	723
Tharaka North	838.8	58,345	70	61,132	73	63,103	75	64,307	77
Tharaka South	637.0	75,250	118	78,844	124	81,386	128	82,940	130
Mt. Kenya Forest	360.1	398	1	417	1	430	1	439	1
Total	2,564.4	393,177	153	411,956	161	425,238	166	433,357	169

(Source KNBS 2019)

Population density is largely influenced by the climatic and ecological factors. Areas with good climatic condition and fertile soils will generally have dense populations. The average population density of the County is 153 persons per square kilometer. Table 3-5 shows population densities of the five sub counties in the county. Based on the 2019 Census, Meru South Sub County is the most densely populated with 656 persons per square kilometer while Tharaka North Sub County is the least densely populated with 70 persons per square kilometer.

Table 3-5 shows the population projections by broad age groups.

Table 3:5: Population Projection by Broad Age Groups

Age Group	2019 (Census)			2022 (Projection)			2025 (Projection)			2027 (Projection)		
	M	F	T	M	F	T	M	F	T	M	F	T
Infant Population (<1 Year)	3,902	3,889	7,791	3,985	3,971	7,956	4,069	4,055	8,124	4,126	4,112	8,238
Under 5 Population	20,169	20,215	40,384	21,125	21,836	42,961	21,111	21,840	42,951	20,767	21,481	42,248
Pre-School (3-5 Years)	12,497	12,475	24,972	12,614	12,928	25,541	12,647	13,135	25,782	12,522	13,006	25,528
Primary School (6 –13 Years)	36,793	36,478	73,271	33,069	32,949	66,018	33,307	33,863	67,170	33,375	34,295	67,670
Secondary School (13 –19 Years)	31,482	30,905	62,387	32,148	31,559	63,706	32,828	32,226	65,054	33,289	32,679	65,967
Youth (15 –29 Years)	49,994	51,198	101,192	51,051	52,281	103,332	52,131	53,386	105,517	52,863	54,136	107,000
Women of Reproductive Age (15 – 49 Years)	0	98,693	98,693	0	100,780	100,780	0	102,911	102,911	0	104,357	104,357
Economically Active Population (15 – 64 years)	115,479	118,056	233,535	126,069	129,682	255,777	131,924	135,412	267,336	135,645	139,213	274,858
Aged (65+)	12,157	15,758	27,915	12,414	16,091	28,505	12,677	16,432	29,108	12,855	16,662	29,517

(Source KNBS 2019)

Under 1 year: based on the 2019 census, the county had a total of 7,791 infants in the year 2019 representing 2% of the total population and the number is expected to be 8,238 by 2027.

This calls for special interventions in order to significantly reduce the high infant mortality rate (IMR) which presently stands at 54 deaths per thousand. Efforts need to be put in place to increase child health care services such as immunization programmes, nutrition services and enhancement of maternal health care.

Under 5 years: In 2019, this population was 40,384 representing 10.3% of the total population and is expected to increase to 42,248 by year 2027 which represents a modest increase over the plan period. This category is entirely dependent on parents and a large amount of the family resources is spent on meeting their basic needs. The under-five mortality Rate (UFMR) for the county is unacceptably high at 63.7 deaths per 1000.

3-5 years (Pre-school): This age group was 24,972 during the 2019 census which represented 6.4% of the total population. By the end of the plan period, it is expected to increase to 25,528. Pre-primary school forms the base for our children's education and learning for their future. There is need for more early childhood education centres that are equipped and with caregivers to take care of this age group.

6-13 years (Primary): This age group is the Primary School going population. During the 2019 census, the county had 73,271 primary school population. This represents 18.6% of the total population and is expected to increase to 67,670 towards the end of 2027. There is need to expand learning facilities at the existing primary schools as well as construct new schools to cater for the attendant costs under the competency-based curriculum. The county has 18 village polytechnics. This number should be increased in order to cater for pupils who do not proceed to high schools after completion of primary education. The existing polytechnics should also be expanded and equipped with the necessary facilities in order to offer quality technical skills.

13-19 years (Secondary): This is the Secondary School age group. The population estimated during the

2019 census indicates that this population cohort was 62,387 in 2019 representing 15.9% of the total population. This will marginally increase to about 65,967 by 2027. The Government policy on fee day secondary education is expected to result to increased enrolment rate. Expansion of physical infrastructure to cater for the increase and improvement of staffing levels will be necessary. In addition, establishment of tertiary institutions offering professional courses will help in improving absorption rates and enhance human resource and skills development in the county.

15-29 years (Youth): In 2019 the youth population was estimated to be 101,192 and is expected to rise 107,000 by the end of 2027. This age bracket form 25.7 % of the total population and fall

within the dependent age group who are still in school/colleges and largely economically dependent. This places a heavy burden on the economically active population that contributes to the economic development and at the same time provides basic needs to the households. The youth category has high potential for productivity and is most at risk and vulnerable. The county needs to direct more resources to provide adequate home craft centres and vocational training centres and invest in special programmes to create employment opportunities.

15-49 years (Reproductive Age): The women of reproductive age are estimated to be 98,693 from the 2019 census numbers representing 25.1 % of the total population. This age cohort is projected to increase to 104,357 by the end of the pan period in 2027. The increase in the female reproductive age group requires efforts to be made in the expansion of existing facilities associated with maternal health, child health care and address cultural issues which hinder men from utilizing reproductive health and other related services. Female genital mutilation is still practiced in some areas and long distances to health facilities compound reproductive health issues. There is also need for education and sensitization programmes to impact knowledge on the importance of family planning to both males and females.

15-64 years (Economically active population): This is the most productive group in the county providing labour force. As per the 2019 Census the group population was 223,535 people comprising of 115,479 (49.4.8%) and 118,050 (50.6%) males and females respectively. This labour force is projected to increase to 267,336 in the year 2025 and 274,858 by the year 2027. A large proportion of the labour force is either unskilled or semi-skilled and is mainly engaged in agricultural activities and construction. This calls for more investments in the county to achieve job creation opportunities. The main challenges for this group include unemployment, underemployment, low education levels, and the HIV/AIDS pandemic. Agriculture and livestock Sub-Sectors have high potential for income generation to households in this age group.

65+ years (Aged Population): The above 64 years' category is mainly composed of the aged population with a large proportion being dependent on the working population. The 2019 census estimates put the population at 27,915 which was 7.1 % of the total population with 15,758 females and 12,157 males. This population is expected to increase to 29,108 in 2025 and 29,517 by 2027. Key social protection programmes should be initiated to address the needs for the aged population and their dependents.

3.2.2.7 Population of Persons with Disability

Table 3-6 shows the population of persons with disability by type and sex in Tharaka Nithi County.

Table 3:6: Population of Persons with Disability

Disability type	Age 5+			5-14			15-24			25-34			35-54			55+		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Tharaka Nithi	352,736	173,562	179,167	91,317	45,952	45,363	74,356	36,934	37,419	54,747	26,346	28,400	79,395	39,787	39,607	52,921	24,543	28,378
Visual	4,840	1,960	2,880	387	207	180	346	151	195	242	89	153	844	318	526	3,021	1,195	1,826
Hearing	2,421	1,036	1,385	298	159	139	221	119	102	147	71	76	394	183	211	1,361	504	857
Mobility	5,182	2,031	3,151	273	155	118	226	125	101	221	113	108	729	328	401	3,733	1,310	2,423
Self-care	2,071	966	1,105	328	178	150	235	135	100	190	109	81	317	200	117	1,001	344	657
Cognition	3,887	1,574	2,313	353	195	158	378	211	167	355	197	158	742	354	388	2,059	617	1,442
Communicating	1,438	789	649	399	236	163	300	171	129	200	114	86	228	134	94	311	134	177

(Source KNBS 2019)

Majority of the people have mobility disability. From the table above, the proportion of the total population aged 5 years and above who have one form of disability, or another is 5.62%. The most prevalent form of disability in the county is mobility followed by visual and cognitive disabilities. Majority of the population with disabilities are aged 55 years and above for all types of disability. Except for communication disability, the prevalence of disability among females is higher than that of males across the board. An increase in prevalence will result in higher demand for social support programmes, including provision of assistive devices for those with mobility disabilities, establishment of more Neema centres and provision of therapeutic services. Further, based on the projections of the population of the 55+ age group, specific interventions such as financing for the elderly through stipends will be key.

3.2.2.8 Demographic Dividend Potential

Table 3-7 shows the demographic dividend potential of Tharaka Nithi County.

Table 3:7: Demographic Dividend Potential

Category	2019	2023	2024	2025	2026	2027
Population Size	393,177	416,383	420,811	425,238	429,298	433,357
Population below 15 (%)	131,710 (33.5)	125,997 (30.3)	126,494 (30.1)	126,989 (29.9)	126,978 (29.6)	126,964 (29.3)
Population 15 – 64 (%)	233,535 (59.4)	59,630 (62.4)	263,483 (62.6)	267,336 (62.9)	271,097 (63.1)	274,858 (63.4)
Population above 65 (%)	27,915 (7.1)	30,756 (7.4)	30,835 (7.3)	30,912 (7.3)	31,223 (7.3)	31,535 (7.3)
Dependency ratio	68.4	60.4	59.7	59.1	58.4	57.7
Fertility rate	2.9					

(Source KNBS 2019)

Based on data illustrated above for the county population pyramid, the county government projects that it shall benefit from a favorable demographic dividend, based on the favorable indicators based on fertility. With a decreased population rate, this trend is expected to be maintained, attributed to a stable county population.

3.2.3 Project Area

Marimanti informal settlement is located in Marimanti ward, Tharaka South sub-county. It measures 1,235 acres and has a population of 12,500 people. The settlement plan contains 3,500 plots with the average size being eighth acre parcels. Within the settlement, there are 15No religious institutions, 10No medical facilities, 10No educational facilities and 1No community center. It surrounds a 250-acre commercial center.

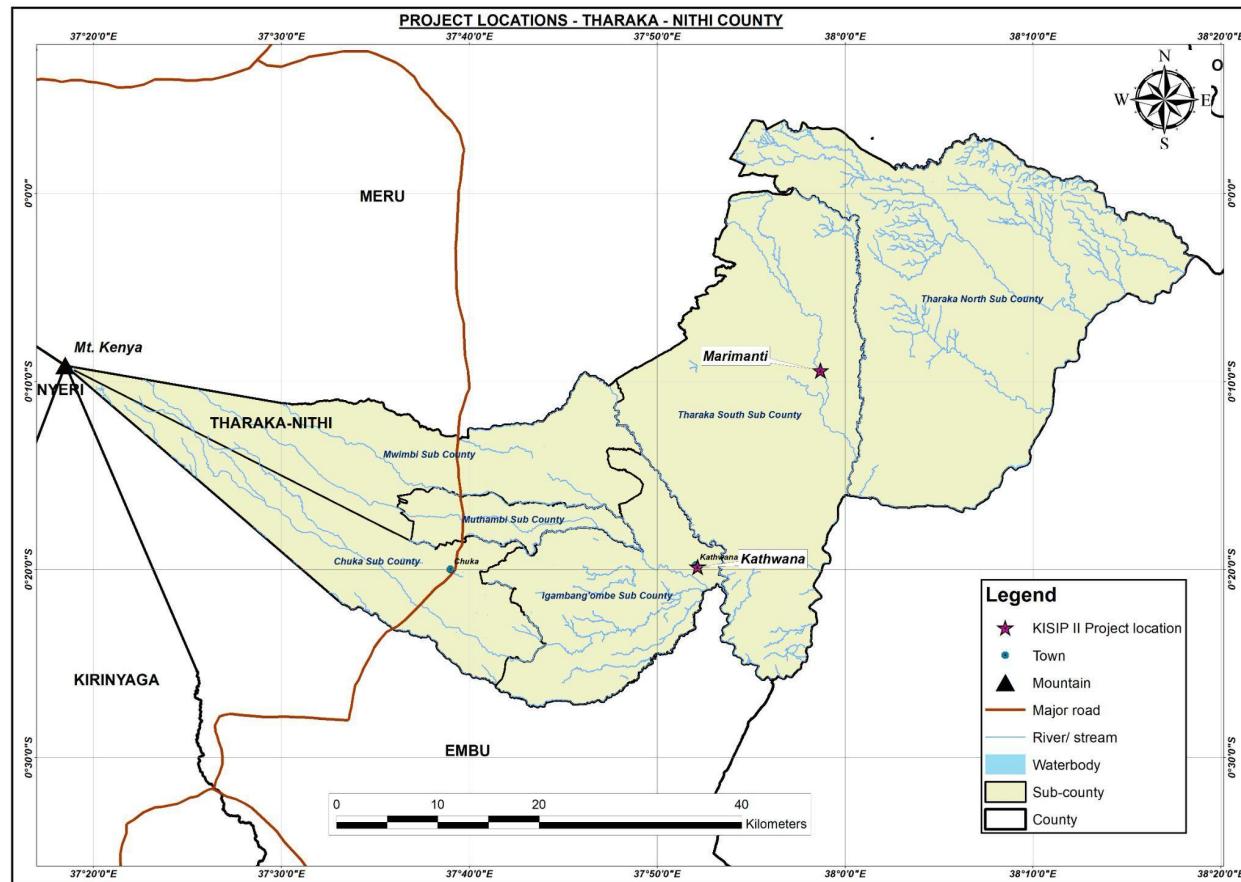


Figure 3-2: Map showing project areas in Tharaka Nithi County

Source: Consultant

3.2.4 Climate

The project areas experience temperatures of up to 40°C especially during the dry season. The project area has a bio-modal rainfall pattern with the long rains falling during the months of April to June and the short rains in October to December. The short rains are more reliable than the long rains. The rainfall ranges from 2,200mm to 500mm with the high-altitude areas experiencing reliable rainfall, middle areas receiving moderate rainfall, while the lower areas receive low, unreliable and poorly distributed rainfall. The climate is favorable for cultivation of maize, cowpeas, pigeon peas, tobacco, and a variety of other food crops.

3.2.4.1 Climate Change Profile for Tharaka Nithi

Tharaka Nithi County has mean annual temperatures that range from below 21°C in the west to above 25°C in the east, this variation being primarily due to an east to west pattern of rising altitude. Similarly, rainfall in the county exhibits a strong east-west gradient of increasing

rainfall. Most of the western part of the county receives average rainfall of 1000- 1250 mm annually; a small pocket in Chogoria Forest receives as much as 2200 mm annually. On the other hand, most of the eastern part of the county receives an average of 750-1000 mm annually, except for a small south eastern corridor where rainfall is 500 - 750 mm. In general, the highland areas in the west have higher, more reliable rainfall and lower temperatures while the lowland areas in the east have lower, less reliable rainfall and higher temperatures. Given the large range of temperature and rainfall in the county, the climate change hazards and risks are similarly broad. They include dry spells and heat stress as well as changes in rainfall season dates and duration along with incidences of flooding. These hazards occasionally result in crop failure; reduction in pasture availability with impacts on livestock weight and output; and damage to infrastructure among others.

Analysis of historical temperature trends in the county over 25 years (1981 to 2005), show that first and second season mean temperatures have increased by approximately 0.7 and 0.5°C respectively. These increases in temperature have resulted in a moderate increase in heat stress days in both seasons. On the other hand, precipitation trends based on analysis over a 35-year period (1981-2015) showed that average first season rainfall is decreasing moderately while average second season rainfall is increasing slightly. The reduction in first season rainfall has resulted in an increase in the occurrence of drought stress over the same period. However, the changes in second season rainfall and temperature have not had an effect on extremes; flash floods and drought stress are therefore likely to remain relatively constant over the period under consideration.

3.2.5 Geology and Ecological conditions

The County has two main ecological zones. The highlands (upper zone) comprise of Maara and Chuka which receive adequate rainfall for agriculture. The semi-arid (lower zone) covers Tharaka and receives less rainfall suitable for livestock production. Poor methods of farming and soil conservation, charcoal burning and overgrazing have left the earth bare and rocky. The sloping areas have experienced uncontrolled soil erosion, which has resulted in deep gullies across the landscape especially in Tharaka. The drainage pattern consists of rivers and streams that ultimately drain into the Indian Ocean through Tana River. The project area is in the lower zone.

3.2.6 Physical and Topographical Features

The region generally comprises of low, hilly, stony and sandy marginal lowlands with moderate forest cover. The main physical feature is the 360 km² of Mt. Kenya forest distributed between Maara and Chuka/Igambang'ombe constituencies. Its hilly terrain leads to soil erosion hence

environment degradation and also makes construction and maintenance of road networks costly.

3.2.7 Economic activities

The major economic activities include, subsistence crop farming, subsistence dairy farming and keeping of other livestock such as goats and sheep. Small-scale traders and markets play a crucial role in the economy of the project area with bustling markets where people buy and sell various goods including foodstuffs, clothing, and household items.

3.2.8 Soil Characteristics

The soil structure in the project area is overlain by a thin profile of sandy clays with low dry-season water retention properties, although the sandy rivers host substantive aquifers.

3.2.9 Solid and liquid wastes

Waste and garbage disposal is mostly managed by the county government. Mismanagement of waste was observed within the settlement which included open dumping of solid waste as well as burning of waste.

3.3 Ecological Environment, Flora and Fauna

There is no wildlife, bird sanctuaries or conservation wetlands within the project site. There are no rare, endangered or endemic species recorded. The ecology of the project area is not substantially rich in diversity or high in endemism.

3.4 Noise pollution Levels

The project will ensure it adheres to the noise permissible levels in accordance with the provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009 as presented in Table 3-8 and Table 3-9.

Table 3:8: Maximum permissible noise levels

Zone		Sound Level Limits dB(A) (Leq,14 h)		Noise Rating Level (NR) (Leq,14 h)	
		Day	Night	Day	Night
A.	Silent Zone	40	35	30	25
B	Places of worship	40	35	30	25
C.	Residential: Indoor	45	35	35	25
	Outdoor	50	35	40	25

Zone		Sound Level Limits dB(A) (Leq,14 h)		Noise Rating Level (NR) (Leq,14 h)	
		Day	Night	Day	Night
D.	Mixed residential (with some commercial and places of entertainment)	55	35	50	25
E.	Commercial	60	35	55	25

Time Frame

- ❖ Day: 6.01 a.m. - 8.00 p.m.
- ❖ Night: 8.01 p.m. - 6.00 a.m.

Table 3:9: maximum permissible noise levels for construction sites

Facility		Maximum Noise Level Permitted (Leq) in dB(A)	
		Day	Night
(i)	Health facilities, educational institutions, homes for disabled etc.	60	35
(ii)	Residential	60	35
(iii)	Areas other than those prescribed in (i) and (ii)	75	65

Source: EMCA (Noise and Excessive Vibrations) Regulations of 2009

3.5 Air quality Tolerance Levels

According to EMCA (Air Quality Regulations) 2014, the air tolerance levels that will be adhered to by the Contractor are presented in Table 3-10:

Table 3:10: Air quality Tolerance Limits

Kenya Subsidiary Legislation, 2014				225
(r 5,6, 7,10,11, 20,33,38)				11
FIRST SCHEDULE				
AMBIENT AIR QUALITY TOLERANCE LIMITS				
<i>Table 1: Ambient Air Quality Tolerance Limits</i>				
Pollutant	Time weighted Average	Industrial area	Residential, Rural & Other areas***	Controlled areas***
1. Sulphur oxides (SO ₂);	Annual Average*	80 µg/m ³	60 µg/m ³	15 µg/m ³
	24 hours**	125 µg/m ³	80 µg/m ³	30 µg/m ³
	Annual Average		0.019 ppm/50 µg/m ³	
	Month Average			
	24 Hours		0.048 ppm/125 µg/m ³	
	One Hour			
	Instant Peak		500 µg/m ³	
	Instant Peak (10 min)		0.191 ppm	
2. Oxides of Nitrogen (NO _x);	Annual Average*	80 µg/m ³	60 µg/m ³	15 µg/m ³
	24 hours**	150 µg/m ³	80 µg/m ³	30 µg/m ³
	8 hours			
	Annual Average		0.2 ppm	
	Month Average		0.3 ppm	
	24 Hours		0.4 ppm	
	One Hour		0.8 ppm	
	Instant Peak		1.4 ppm	
3. Nitrogen Dioxide	Annual Average	150 µg/m ³	0.05 ppm	
	Month Average		0.08 ppm	
	24 Hours	100 µg/m ³	0.1 ppm	
	One Hour		0.2 ppm	
	Instant Peak		0.5 ppm	
4. Suspended Particulate matter (SPM)	Annual Average*	360 µg/m ³	140 µg/m ³	70 µg/m ³

Kenya Subsidiary Legislation, 2014				
Pollutant	Time weighted Average	Industrial area	Residential, Rural & Other areas***	Controlled areas***
	24 hours**	500 µg/m ³	200 µg/m ³	100 µg/m ³
		Industrial area	Residential, Rural & Other areas***	Controlled areas***
	mg/Kg			
	Annual Average****		100 µg/m ³	
	24 hours***		180 µg/m ³	
5. Respirable Particulate Matter (<10µm) (RPM)	Annual Average*	70 µg/m ³	50 µg/m ³	50 µg/m ³
	24 hours**	150 µg/Nm ³	100 µg/Nm ³	75 µg/Nm ³
6. PM _{2.5}	Annual Average	35 µg/m ³		
	24 hours	75 µg/m ³		
7. Lead (Pb)	Annual Average*	1.0 µg/Nm ³	0.75 µg/Nm ³	0.50 µg/m ³
	24 hours**	1.5 µg/m ³	1.00 µg/m ³	0.75 µg/m ³
	Month Average		2.5	
8. Carbon monoxide (CO)/ carbon dioxide (CO ₂)	8 hours**	5.0 mg/m ³	2.0 mg/m ³	1.0 mg/m ³
	1 hour	10.0 mg/m ³	4.0 mg/m ³	2.0 mg/m ³
	mg/Kg			
	24 hours**			
9. Hydrogen Sulphide	24 hours**	150 µg/m ³		
10. Non-methane hydrocarbons				
	instant Peak	700 ppb		
11. Total VOC	24 hours**	600 µg/m ³		
12. Ozone	1-Hour	200 µg/m ³	0.12 ppm	
	8 hour (instant Peak)	120 µg/m ³	1.25 ppm	

Kenya Subsidiary Legislation, 2014

227

And any other parameter as may be prescribed by the Authority from time to time

Legend

- (a) μg - microgram
- (b) m^3 - cubic metre
- (c) ppm - Parts per million
- (d) ppb - Parts per billion
- (e) Values at Standard Temperature and Pressure (STP)
- (f) Conversion factors from ppm to mg/m^3 and mg/m^3 to ppm are stipulated under the Eleventh Schedule
- (g) * [Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.]
- (h) [** 24 hourly/8 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed but not on two consecutive days.]
- (i) Whenever and wherever two consecutive values exceeds the limit specified above for the respective category, it would be considered adequate reason to institute regular/continuous monitoring and further investigations.
- (j) * the 24-hour limit may not be exceeded more than three times in one year;
- (k) ** 24-hour limit may not be exceeded more than three times in one year micrograms/m³
- (l) *** Not to be exceeded more than once per year average concentration
- (m) *** In conversion of units from ppm to mg/m^3 and vice versa shall use guidelines set out under Part II of the Fifth Schedule.

(b) Table 2: Ambient Air Quality at Property Boundary for General Pollutants

	Pollutant	Time weighted Average	Property Boundary
1.	Particulate matter (PM)	Annual Average*	50 $\mu\text{g}/\text{m}^3$
		24 hours**	70 $\mu\text{g}/\text{m}^3$
2.	Oxides of Nitrogen (NO_x);	Annual Average*	80 $\mu\text{g}/\text{m}^3$
		24 hours**	150 $\mu\text{g}/\text{m}^3$
3.	Sulphur oxides (SO_x);	Annual Average*	50 $\mu\text{g}/\text{m}^3$
		24 hours**	125 $\mu\text{g}/\text{m}^3$
4.	Hydrogen Sulphide	24 hours**	50 $\mu\text{g}/\text{m}^3$
5.	Ammonia	24 hours**	100 $\mu\text{g}/\text{m}^3$

Note.

- (a) For residential premises in designated industrial areas, the above standards do not apply.

228

Kenya Subsidiary Legislation, 2014

- (b) For industries in designated residential areas, standards for residential areas shall apply.

(r6,10,14,25,35,37,75)

SECOND SCHEDULE

PRIORITY AIR POLLUTANTS

Part I: General Source Pollutants

- (a) Particulate matter (Dust, black smoke, smog, aerosols);
- (b) Sulphur oxides (SO_x);
- (c) Nitrogen oxides (NO_x);
- (d) Carbon monoxide (CO)
- (e) Carbon dioxide (CO_2);
- (f) Hydrocarbons (HC);
- (g) Volatile organic Compounds(VOC);
- (h) Hydrogen Sulphide (H_2S);
- (i) Hydrogen Chloride (HCl);
- (j) Lead and its compounds;
- (k) Mercury vapour (Hg)
- (l) Ozone (O_3);
- (m) Dioxins and furans (PCDD and PCDF).

Part II: Mobile Source Pollutants

- (a) Hydrocarbons (HCs)
- (b) Volatile organic Compounds(VOC);
- (c) Sulphur dioxide (SO_x)
- (d) Nitrogen oxides (NO_x)
- (e) Particulates (PM)
- (f) Carbon Monoxide (CO)

Part III: Greenhouse gases(GHG)

- (a) Carbon dioxide (CO_2);
- (b) Methane (CH_4);
- (c) Nitrous oxides (N_2O);
- (d) Hydrofluorocarbons (HCFCs);
- (e) Perfluorocarbons (PFCs); and
- (f) Sulphur hexafluoride (SF_6).

Source: EMCA (Air Quality Regulations) 2014

3.6 Water Quality – Standard Effluent Discharge into the Environment

The project will adhere to the standard effluent discharge into the environment stipulated by Environmental Management and Co-ordination (Water Quality) Regulations, 2006 presented in Table 3-11.

Table 3:11: standard effluent discharge into the environment

Parameter	Max Allowable(Limits)
1,1,1-trichloroethane (mg/l)	3
1,1,2-trichloroethane (mg/l)	0.06
1,1-dichloroethylene	0.2
1,2-dichloroethane	0.04
1,3-dichloropropene (mg/l)	0.02

Parameter	Max Allowable(Limits)
Alkyl Mercury compounds	Nd
Ammonia, ammonium compounds, NO_3 compounds and NO_2 compounds (Sum total of ammonia-N times 4 plus nitrate-N and Nitrite-N) (mg/l)	100
Arsenic (mg/l)	0.02
Arsenic and its compounds (mg/l)	0.1
Benzene (mg/l)	0.1
Biochemical Oxygen Demand (BOD 5days at 20 °C) (mg/l)	30
Boron (mg/l)	1.0
Boron and its compounds – non marine (mg/l)	10
Boron and its compounds –marine (mg/l)	30
Cadmium (mg/l)	0.01
Cadmium and its compounds (mg/l)	0.1
Carbon tetrachloride	0.02
Chemical Oxygen Demand (COD (mg/l)	50
Chromium VI (mg/l)	0.05
Chloride (mg/l)	250
Chlorine free residue	0.10
Chromium total	2
cis –1,2- dichloro ethylene	0.4
Copper (mg/l)	1.0
Dichloromethane (mg/l)	0.2
Dissolved iron (mg/l)	10
Dissolved Manganese(mg/l)	10
E.coli (Counts / 100 ml)	Nil
Fluoride (mg/l)	1.5
Fluoride and its compounds (marine and non-marine) (mg/l)	8
Lead (mg/l)	0.01
Lead and its compounds (mg/l)	0.1
n-Hexane extracts (animal and vegetable fats) (mg/l)	30
n-Hexane extracts (mineral oil) (mg/l)	5
Oil and grease	Nil
Organophosphorus compounds (parathion, methyl parathion, methyl demeton and Ethyl parantrophenyl phenylphosphorothroate, EPN only) (mg/l)	1.0
Polychlorinated biphenyls, PCBs (mg/l)	0.003
pH (Hydrogen ion activity marine)	5.0-9.0

Parameter	Max Allowable(Limits)
pH (Hydrogen ion activity--non-marine)	6.5-8.5
Phenols (mg/l)	0.001
Selenium (mg/l)	0.01
Selenium and its compounds (mg/l)	0.1
Hexavalent Chromium VI compounds (mg/l)	0.5
Sulphide (mg/l)	0.1
Simazine (mg/l)	0.03
Total Suspended Solids, (mg/l)	30
Tetrachloroethylene (mg/l)	0.1
Thiobencarb (mg/l)	0.1
Temperature (in degrees Celsius) based on ambient temperature	3
Thiram (mg/l)	0.06
Total coliforms (counts /100 ml)	30
Total Cyanogen (mg/l)	Nd
Total Nickel (mg/l)	0.3
Total Dissolved solids (mg/l)	1200
Colour in Hazen Units (H.U)	15
Detergents (mg/l)	Nil
Total mercury (mg/l)	0.005
Trichloroethylene (mg/l)	0.3
Zinc (mg/l)	0.5
Whole effluent toxicity	
Total Phosphorus (mg/l)	2 Guideline value
Total Nitrogen	2 Guideline value

Source: EMCA (Water Quality) Regulations, 2006

CHAPTER 4: ANALYSIS OF PROJECT ALTERNATIVES

4.1 Overview

Regulation 18 (1) of Legal Notice 101 specifies the basic content of an Environmental Impact Assessment Study / Project Report subsequent to which, subsection (i) requires an analysis of alternatives. Analysis of Project Alternatives requires comparison of feasible alternatives for the proposed Project in terms of: Project site, Project technology, Potential Environmental and Social Impacts, capital and recurrent costs, suitability under local conditions, and acceptability by neighboring land users.

This chapter describes and examines the various alternatives considered during the design of the Project. The consideration of alternatives is one of the proactive sides of environmental and social assessment required to enhance Project design. This is achieved through examining options instead of only focusing on the more defensive task of reducing adverse impacts of a single design option. The alternative that was considered for the project was focused on:

- Project resettlement impacts
- Analysis of alternative materials
- No project alternative
- Proposed project option

4.2 Project Resettlement Impacts

The design team has ensured as much as possible that the project shall be constructed within available public land and existing way-leaves. This shall eliminate cases of resettlement and reduce project costs that are usually related to compensation.

4.3 Analysis of Alternative Material

The proposed project shall be constructed using modern, locally, and internationally accepted materials to achieve public health, safety, security, and environmental aesthetic requirements. Equipment that saves energy and water shall be given priority without compromising on cost or availability factors. The use of local stones, cement, sand (washed and clean), metal bars, pipes and fittings that meet the Kenya Bureau of Standards requirements is recommended.

For water component, Marimanti sources its water from the NIWASCO distribution system. The quantity of water from the system is adequate to meet the existing demand. Hence, the project has focused on extension of the water distribution system.

For sanitation component, there is no existing sewerage system in Marimanti. Provision of a sewerage system will be capital intensive as it will require construction of WWTP. To ensure safe sustainable sanitation services, a well-equipped ablution block has been provided with a septic tank.

4.4 No Project Alternative

This alternative describes a situation where the proposed projects shall not be put up. It is advantageous in that there shall be no negative impacts to the environment.

The “No project action alternative” shall however lead to the following (general) major negative and long term impacts:

- i) There shall be no increased local income from sale of construction materials from their firms and also renting spaces for camp sites;
- ii) There shall be no economic growth in the target project area if the project is not implemented since no use of locally available materials during the construction phase for example cement and pipes that can be purchased in the area;
- iii) No new employment shall be created if the proposed intervention is not implemented. Creation of employment opportunities is expected to arise during construction as well as the operation phase of the project;
- iv) The targeted populations especially residents of Marimanti Informal settlement shall not benefit from the supply of safe, reliable adequate water, accessible roads, improved road connectivity, improved security, improved gender parity amongst other benefits;
- v) Women and girl child shall continue having the burden to collect water from the rivers; with the provision of household connections, time spent to fetch water for storage shall now be used for other activities such as running businesses for women while the girls can use that time for studying;
- vi) Improved hygiene and sanitation standards shall not be attained in the project target areas. Good hygiene and sanitation standards are directly linked to provision of reliable and adequate water supply as well as provision of adequate sanitation facilities; and
- vii) Improved revenue for Nithi Water and Sewerage Company shall not be attained without the increased number of residents being served.

The “No Project alternative” is therefore not a viable alternative to adopt for this project, this is due to the fact that implementing the proposed improvement works in Marimanti informal settlement is linked with benefits aforementioned above amongst other benefits.

4.5 Proposed Project Option

The proposed project shall involve improvement works in Marimanti informal settlement leading to an increase in water coverage and household connections, improved sanitation, improved road network and improved security.

The positive impacts, negative impacts and mitigation measures for this alternative are discussed detailed in Chapter 7 of this report. This alternative shall have minimal impacts on the physical environment and has considered the necessary measures to eliminate the identified issues of concern. The alternative is likely to have the greatest implications on socio-economic environment of the area and surrounding communities. Due to the proposed quality of the development, it is anticipated that it would provide a major opportunity for area development, employment opportunities via business environment and accessibility to services to both the residents and non-residents of the area. In addition, a development of this caliber shall add to the locality's ability to fuel the growth and development of the wider environment.

The merits of this alternative are as follows:

- There shall be a stable and reliable water supply to household levels;
- Improved road connectivity as a result of tarmac section of the earth road;
- The property (land) value shall appreciate due to improved road networks, security and connection of water to household levels;
- Optimal economic and spatial land-use due to improved road network;
- Visual and aesthetic amenities shall be improved especially with the improved security lighting and road network;
- The community shall have potential source of income through the supply of materials at the site such as sand, cement, pipes, self- sustainability, employment opportunities and better service delivery in the long run; and
- The local and national economies shall improve from the revenue collected from the sale of water.

From the above analysis of alternatives, the 'Proposed Project Option' is the most valid option that should be adopted since it has more positive impacts to the environment and the community in the project area as a whole with minimal negative impacts that can be minimized or avoided with the implementation of the proposed mitigation measures as details in the Environmental and Social management and Monitoring Plan (ESMMP).

CHAPTER 5: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

5.1 Introduction

Development of infrastructure projects is dealt with under several laws, By-laws, regulations and Acts of parliament, as well as policy documents and it is not possible to bring all these statutes under one heading. This chapter therefore outlines the policy, legal, regulatory and institutional framework for Environmental Management in Kenya which calls for compliance by all development Projects.

5.2 Environmental Policy Framework

5.2.1 Constitution of Kenya 2010

Article 42 of Bill of Rights of the Kenyan Constitution provides that every Kenyan has a right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislation and other measures.

Part II of Chapter 5 of the Constitution (Environment and Natural Resources), (I) the State clearly undertakes to carry out the following:

- Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
- Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;
- Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
- Encourage public participation in the management, protection and conservation of the environment; Protect genetic resources and biological diversity;
- Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
- Eliminate processes and activities that are likely to endanger the environment;

Part (II) "Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources. Chapter 5 on Land and Environment emphasizes on the following:

- Land use and management shall by law benefit local communities
- Community land is protected from encroachment by State.
- Law shall protect Rivers, forests and water bodies.

- Equitable access to land.
- All lawful land rights are secured; only someone who has stolen land needs to worry.
- County governments shall manage land in trust of the people according to the constitution.

Further, Article 70 states that if a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress. The project should ensure compliance with the Constitution in so far as equitable sharing of the resources between the stakeholders is concerned.

Relevance to the proposed project.

The project should ensure that the sustainability of livelihoods and biological resources within the project areas are protected. Any development proposals should also be cognizant of the increased powers under the Constitution given to communities and individuals to enforce their rights through legal redress.

5.2.2 The National Environment Action Plan (NEAP)

The National Environmental Action Plan (NEAP) is one of the anchor policies that support environmental protection and relevant to this project. The NEAP was a deliberate policy effort to integrate environmental considerations into the Country's economic and social development. The integration process was to be achieved through a Multi-sectoral approach to develop a comprehensive framework to ensure that environmental Management and conservation of natural resources are an integral part of societal decision-making.

Relevance to the proposed project.

The NEAP has indicated how resources within particular sections of the country should be managed in order to ensure their sustainable utilization. The project should be implemented and operated based on these guidelines.

5.2.3 National Land Policy 2009

Chapter 2 of the policy is linked to constitutional reforms; regulation of property rights is vested in the government by the Constitution with powers to regulate how private land is used in order to protect the public interest. The Government exercises these powers through compulsory acquisition and development control. Compulsory acquisition is the power of the State to take over land owned privately for a public purpose. However, the Government must make prompt payment of compensation.

Chapter 4 of the land policy under Environmental Management Principles, the policy provides actions for addressing the environmental problems such as the degradation of natural resources, soil erosion, and pollution. For the management of the urban environment it provides guidelines to prohibit the discharge of untreated waste into water sources by industries and local authorities; it also recommends for appropriate waste management systems and procedures, including waste and waste water treatment, reuse and recycling.

The policy goes further to advocate for environmental assessment and audit as a land management tool to ensure environmental impact assessments and audits are carried out on all land developments that may degrade the environment and take appropriate actions to correct the situation. Public participation has been indicated as key in the monitoring and protection of the environment. Chapter 4 further advocates for the Implementation of the polluter pays principle which ensures that polluters meet the cost of cleaning up the pollution they cause, and encourage industries to use cleaner production technologies.

Relevance

The project proponent shall implement the ESMP to ensure that the environment within project area and adjacent areas is not polluted by the subsequent activities during construction and operational phases.

5.2.4 Kenya Vision 2030

The Kenya Vision 2030 aspires for the country firmly interconnected through a network of roads, railways, ports, airports, water and sanitation facilities and telecommunications. According to Vision 2030, Kenya is a water scarce country. The economic and social developments anticipated by Vision 2030 shall require more high quality water supplies than at present. The country, therefore, aims to conserve water sources and start new ways of harvesting and using rain and underground water. The 2030 Vision aims at ensuring that water and sanitation is improved, available and accessible to all.

Relevance

The proposed project is in line with the vision 2030 as it shall lead to improved water availability, improved road network and security in Marimanti informal settlement

5.2.5 The Kenya Environmental Sanitation and Hygiene Policy 2016-2030

The Kenya Environmental Sanitation and Hygiene Policy 2016-2030 (KESHP) envisions a clean, healthy and economically prosperous Kenya free from sanitation and hygiene related diseases and seeks to ensure universal access to improved sanitation, clean and healthy environment by 2030

Relevance

The Contractor shall need to abide by this provision.

5.3 Overview of Relevant Legislation

5.3.1 The Environmental Management and Coordination (Amendment) Act, 2015

The Act provides for the establishment of a legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. Just as in the new constitution, Part II of EMCA confers to every person the right to a clean and healthy environment and to its judicial enforcement. The new Constitution and EMCA therefore obligates the project's Executing Agency and Contractor to work in a clean environment and not to contravene the right of any person within its zone of influence, to this entitlement. EMCA has provided for the development of several subsidiary legislations and guidelines which govern environmental management and are relevant to the project implementation. These include:

a) The Environmental (Impact Assessment and Audit) Regulations, 2009 Legal Notice No. 101

The Environmental Impact Assessment and Audit Regulations state in Regulation 3 states that "the Regulations should apply to all policies, plans, programme, projects and activities specified in Part IV, Part V and the Second Schedule of the Act.

Part III of the Regulations indicates the procedures to be taken during preparation, submission and approval of the environmental project report.

Part 4(1) of the Regulation further states that: "no Proponent shall implement a project"

- a) Likely to have a negative environmental impact; or
- b) For which an environmental impact assessment is required under the Act or these Regulations, unless an environmental impact assessment has been concluded and approved in accordance with these Regulation.

Relevance

This ESIA CPR report has been compiled to comply with EMCA and the Environmental (Impact Assessment and Audit) Regulations, 2003.

b) The Environmental Management and Coordination (Waste Management) Regulations, 2006 Legal Notice No. 121

These Regulations were published in the Kenya Gazette Supplement No. 69, Legislative Supplement No. 37, and Legal Notice No. 121 of 29th September, 2006. The regulations provide details on management (handling, storage, transportation, treatment and disposal) of various waste streams including:

- Domestic waste;
- Industrial waste;
- Hazardous and toxic waste;
- Pesticides and toxic substances;
- Biomedical wastes; and
- Radioactive waste.

Regulation No. 4 (1) makes it an offence for any person to dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle. Regulation 5 (1) provides categories of cleaner production methods that should be adopted by waste generators in order to minimize the amount of waste generated and they include:

- I. Improvement of production process through
 - Conserving raw materials and energy;
 - Eliminating the use of toxic raw materials and wastes;
 - Reducing toxic emissions and wastes.
- II. Monitoring the product cycle from beginning to end by
 - Identifying and eliminating potential negative impacts of the product;
 - Enabling the recovery and re-use of the product where possible,
 - Reclamation and recycling and
 - Incorporating environmental concerns in the design and disposal of a product.

Regulation 6 requires waste generators to segregate waste by separating hazardous waste from non-hazardous waste for appropriate disposal. Regulation 15 prohibits any industry from discharging or disposing of any untreated waste in any state into the environment. Regulation 17 (1) makes it an offence for any person to engage in any activity likely to generate any hazardous waste without a valid Environmental Impact Assessment license issued by NEMA.

Relevance

The proposed project, during construction phases shall generate wastes which shall need to be disposed of as per the guidelines in the regulations.

c) The Environmental Management and Coordination (Water Quality) Regulations, 2006 Legal Notice No. 120

These Regulations were published in the Kenya Gazette Supplement No. 68, Legislative Supplement No.36, and Legal Notice No. 120 of 29th September, 2006. The Regulations provides for sustainable management of water resources including prevention of water pollution and protection of water sources (lakes, rivers, streams, springs, wells and other water sources).

It is an offence under Regulation No. 4 (2), for any person to throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution. Regulation No. 11 further makes it an offence for any person to discharge or apply any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or permit the dumping or discharge of such matter into the aquatic environment unless such discharge, poison, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards for effluent discharge into the environment.

Relevance

The proponent should ensure that waste is handled, stored, transported and disposed as per this regulation.

d) The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 Legal Notice No. 61

These regulations were published as legal Notice No. 61 being a subsidiary legislation to the Environmental Management and Co-ordination Act, 2015. The regulations provide information on the following:

- Prohibition of excessive noise and vibration;
- Provisions relating to noise from certain sources;
- Provisions relating to licensing procedures for certain activities with a potential of emitting excessive noise and/or vibrations and Noise and excessive vibrations mapping.

According to regulation 3 (1), 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. Regulation 4 prohibits any person to (a) make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or (b) cause to be made excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source.

Regulation 5 further makes it an offence for any person to make, continue or cause to be made or continued any noise in excess of the noise levels set in the first schedule to these Regulations, unless such noise is reasonably necessary to the preservation of life, health, safety or property.

Regulation 12 (1) makes it an offence for any person to operate a motor vehicle which (a) produces any loud and unusual sound; and (b) exceeds 84 dB(A) when accelerating. According to sub-regulation 2 of this regulation, 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. Regulation 13 (1) provides that except for the purposes specified in sub-Regulation (2) there under, no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or steam or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the Second Schedule to these Regulations.

Regulation 19 (1) prohibits any person to carry out activities relating to fireworks, demolitions, firing ranges or specific heavy industry without a valid permit issued by the Authority. According to sub-regulation 4, such permit shall be valid for a period not exceeding three months.

Relevance

The Contractor for road works and civil works shall be required to ensure compliance with the above regulations in order to promote a healthy and safe working environment throughout the construction phase. This shall include regular inspection and maintenance of equipment and prohibition of unnecessary hooting of vehicles.

e) The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006 Legal Notice No. 160

Part II of Regulations, section 4 states that no person shall engage in any activity that may have adverse impacts on ecosystems, lead to introduction of exotic species or lead to unsustainable use of natural resources without an EIA license. The regulation puts in place measures to control and regulate access and utilization of biological diversity that include among others banning and restricting access to threatened species for regeneration purposes. It also provides for protection of land, sea, Lake or river declared to be a protected natural environmental system in accordance to section 54 of EMCA, 2015

Relevance

It is recommended that landscaping programme should involve use of certified plant species to prevent them from affecting project area negatively in terms of invading wetlands, vegetation and even farmlands. Erosion prevention techniques used by the contractor should not involve use of untested exotic plant species that might eventually colonize the project area.

Other relevant EMCA 2015 to be considered during construction and operation of the project are;

- Environmental Management and Coordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulation, 2009.
- Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations, 2006
- The Environmental Management and Coordination (Controlled Substances) Regulations, 2007 Legal Notice No. 73.

Relevance

EMCA 2015 and above listed regulations shall form the main statutory instruments which shall guide the implementation of the project so that any likely adverse impacts that could be caused by the project are promptly mitigated as recommended in this assessment. This report is also in compliance with the requirement of the EIA/EA regulations.

5.3.2 The National Poverty Eradication Plan (NPEP)

The objective of NPEP is to alleviate poverty in rural and urban areas by 50 percent by the year 2015 as well as the capabilities of the poor and vulnerable groups to earn income. It also aims to narrow gender and geographical disparities and a healthy, better educated and more productive population. This plan has been prepared in line with the goals and commitments of the World Summit for the Sustainable Development (WSSD) of 1995.

Relevance to the proposed project.

Since unemployment is among the indicators of poor societies, pursuits to address it build individuals capacity to relieve poverty. The job opportunities anticipated during the project cycle will aid in improving livelihoods for the beneficiaries.

5.3.3 Water Act 2016

Section 73 of the Act allows a person with a license to supply water (licensee) to make regulations for purposes of protecting against degradation of sources of water which he is

authorized to take. Under the Act, the licensee could be a local authority, a private Trust or an individual and the law shall apply accordingly under the supervision of the Regulatory Agency.

Section 75 and sub-section 1 allows a licensee for water supply to construct and maintain drains, sewers and other works for intercepting, treating or disposing of any foul water arising or flowing upon land for preventing water belonging to the licensee or which he is authorized to take for supply from being polluted. However, if the proposed works shall affect or is likely to affect any body of water in the catchment, the licensee shall obtain consent from the Water Resources Authority.

Relevance

This Act shall be relevant during both the construction and operation phases of the project whereby the Contractor and Proponent shall ensure that all relevant water resources are not polluted from both liquid and solid wastes.

5.3.4 Water Rules 2021

These Regulations implement provisions of the Water Act, no. 43 of 2016. They shall apply to the regulation, management, use and development of all water resources, perennial or seasonal and including water resources of the territorial sea.

Matters covered by these Regulations include: prescription of water use activities; issue of approvals, permits and authorizations for water use and waterworks; guidelines on surface water, including declaration of a watercourse, wetlands, land reclamation, water use for irrigation and Works Associated for protection and control of fish; groundwater development, including borehole and issue of specific permits and authorizations; water quality monitoring and liquid waste disposal, including control of water pollution, water quality monitoring; inspection and controls concerning waterworks; water use charges, including penalties for misuse or for over-abstraction; roles and powers of water resource users associations and basin water resources committees; identification of protected and designated groundwater conservation areas; composition of reserve; categories of water sector professionals and contractors and issue of related permits and licenses.

Relevance

The project shall ensure that the riparian areas are respected and are not interfered with.

5.3.5 The Penal Code CAP 63

Chapter XVII on “Nuisances and offences against health and convenience” contained in the penal code strictly prohibits the release of foul air into the environment which affects the health of the persons. It states “Any person who voluntarily vitiates the atmosphere in any

place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighborhood or passing along a public way is guilty of a misdemeanor”

Relevance to the proposed project.

Waste disposal and other project related activities shall be carried out in such a manner as to conform to the provisions of the code.

5.3.6 County Government Act No. 17 of 2012

Part II of the Act empowers the county government to oversee functions described in Article 186 of the constitution, (county roads, water and Sanitation, Health). Part XI of the Act vests the responsibility of planning and development facilitate the development of a well-balanced system of settlements and ensure productive use of scarce land, water, and other resources for economic, social, ecological and other functions across a county. This arrangement has been adopted for interventions in order not to conflict with provisions of the Kenyan Constitution.

Relevance

The Contractor will be expected to carry out implementation of the project in consultation with the Tharaka Nithi County

5.3.7 Traffic Act, Chapter 403.

This Act consolidates the laws relating to traffic on all public roads. It also prohibits the encroachment on and damage of roads including land reserved for roads.

Relevance

The proposed project is essentially under the provision of this Act. In compliance, engineering design will include road furniture that will assist motorists comply with the Act. The design is based on Kenyan Roads Design Manual

5.3.8 Public Roads and Roads of Access Act (Cap. 399).

Section 8 and 9 of the Act provides for the dedication, conservation or alignment of public travel lines including construction of access roads adjacent to lands from the nearest part of a public road. Section 10 and 11 allows for notices to be served on the adjacent land owners seeking permission to construct the respective roads.

Relevance

Already public meetings were held during public consultations and notifications to effect this.

5.3.9 The Kenya Roads Act – (CAP 399) NO. 2, 2007.

An Act of Parliament that provides for the establishment of the Kenya National Highways Authority, the Kenya Urban Roads Authority and the Kenya Rural Roads Authority with clear and separated mandates. Part II of the Act establishes the various Roads Authorities in Kenya and outlines their functions.

Section 8 and 9 of the Act provides for the dedication, conservation or alignment of public travel lines including construction of access roads adjacent to lands from the nearest part of a public road. Section 10 and 11 allows for notices to be served on the adjacent landowners seeking permission to construct the respective roads. Already public meetings were held during public consultations and notifications to this effect issued.

Section 23 of the Act outlines procedures for acquisition of land for the purpose of the Authority's development while Section 24 (1) allows any authorized employee of an Authority to enter upon any land and survey such land or any portion thereof for the purposes of the Authority's development activities. Section 24 (2) provides that where any damage to land is caused by reason of the exercise of the powers conferred by this section, the owner or occupier of the land shall be entitled to compensation therefore in accordance with this Act.

Relevance of the Project

By undertaking this project, the project proponent is exercising his mandate and, that include planning, designing, construction and maintenance of Government assets in the field of built environment and infrastructure development

5.3.10 The Physical and Land Use Planning Act, 2019

The Physical and Land Use Planning Act, 2019 is an act of Parliament to make provision for the planning, use, regulation and development of land and for connected purposes. The Act provides a vital link with the Environment Management and Co-ordination Act. For example, Section 36 of the Act states that “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 shall have injurious impact on the environment, the applicant shall be required to submit together with the application an environmental impact assessment report”. This reinforces EIA requirements under EMCA 2015

Relevance

The Act directs, regulates and harmonizes development and use of land over the Country. The large part of the project is designed to utilize public land. This was in an effort to avoid cases of acquisition of private property and resettlement complications.

5.3.11 Occupational Health and Safety Act (OSHA 2007)

This legislation provides for protection of workers during construction and operation phases. It is tailored at implementation of the EHS plan in compliance with the relevant sections of this Act. The EMP prepared under this assessment has provided for specific health and safety aspects to be complied with during implementation of the project.

Subsection 18 - Sanitary conveniences

Sufficient and suitable sanitary conveniences for persons employed in the factory/ work places shall be provided, maintained and kept clean, and effective provision shall be made for lighting the conveniences and where persons of both sexes are, such conveniences shall afford proper separate accommodation for persons of each sex.

Subsection 21 – Prime movers

Every flywheel directly connected to any prime mover and every moving part of any prime mover, shall be securely fenced, whether the flywheel or prime mover is to be situated in an engine –house or not. Head and tailrace of every water wheel and of every water turbine shall be securely fenced. Every part of electric generators, motors and rotary converters and every flywheel directly connected thereto shall be securely fenced unless it is in such a position or of such construction as to be safe to every person employed or working in the premises as it would be if securely fenced.

Subsection 22 -Transmission Machinery

(1) Every part of transmission machinery shall be securely fenced unless it is in such a position or of such construction as to be safe to every person employed or working in the premises, as it would be if securely fenced.

(2) Efficient devices or appliances shall be provided and maintained in every room or place where work is carried on by which the power can promptly be cut-off from transmission machinery in that room or place.

(3) Every machine intended to be driven by mechanical power shall be provided with an efficient starting and stopping appliance, the control of which shall be in such a position as to be readily and conveniently operated by the person operating the machine.

Subsection 25 - Construction and maintenance of fencing

All fencing or other safeguards provided in pursuance of the foregoing provisions shall be of substantial construction, constantly maintained, and kept in position while the parts required to be fenced or safe guarded are in motion or in use except when any such parts are necessarily

exposed for examination and for any lubrication or adjustments shown by such examination to be immediately necessary.

Subsection 13 – Cleanliness

Every factory/work place shall be kept in a clean state and free from effluent arising from any drain, sanitary convenience or nuisance.

Subsection 14 – Overcrowding

A factory/ work place shall not while work is carried on be so overcrowded as to cause risk of injury to the health of the persons employed therein. Standard cubic space allowed for every person in a workroom should not be less than three hundred and fifty cubic feet.

Section 51- Air pollution

Preventive measures shall be put in place during operation of the project to prevent fumes and exhaust gases from entering into the atmosphere.

Relevance to the Project

The Act provides Occupational Health and Safety guidelines which shall be followed by both the contractor and supervising consultant during implementation of the project in order to avoid injuries and even loss of life to workers and neighboring community.

5.3.12 The Public Health Act (Cap.242)

Part IX section 115 of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires Local Authorities to take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable for injurious or dangerous to human health. Such nuisance or conditions are defined under section 118 and include nuisances caused by accumulation of materials or refuse which in the opinion of the medical officer of health is likely to harbor rats or other vermin.

Relevance

The Act provides guidelines to the contractor on how he shall manage all wastes (Liquid and Solid Wastes) emanating from the project in a way not to cause nuisance to the community, this Act during construction shall be read alongside the waste management regulations of EMCA 2015 for utmost compliance. The Act also shall be applied to ensure that the food that is provided to the workers during construction of the project meets the safety requirements.

5.3.13 Climate Change Act, 2016

The CCA aims to reduce vulnerability to climate change and improve our country's ability to take advantage of the opportunities that climate change offers. The Act is to be applied for the development, management, implementation, and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.

The Purpose and Objectives Clause of the Act (Part 1, Section 3) provides that-

(2) Without prejudice to subsection (1), this Act shall be applied to all sectors of the economy by the national and county governments to –

- a) Mainstream climate change responses into development planning, decisions making, and implementation.
- b) Build resilience and enhance adaptive capacity to the impacts of climate change.
- c) Formulate programme and plans to enhance the resilience and adaptive capacity of humans and ecological systems to the impacts of climate change.
- d) Mainstream and reinforce climate change disaster risk reduction into strategies and actions of public and private entities.
- e) Mainstream intergenerational and gender equity in all aspects of climate change responses.

Relevance

The development and implementation of the proposed interventions will contribute toward the stated objectives of the climate change act.

5.3.14 Employment Act

This is an Act of parliament that applies to all employees employed by any employer under a contract of service. The Act came in operation in June 2008. Employment of children in the following forms is prohibited in the following sections of the Act:

53. (1) notwithstanding any provision of any written law, no person shall employ a child in any activity that constitutes worst form of child labour.

56. (1) No person shall employ a child who has not attained the age of thirteen years whether gainfully or otherwise in any undertaking.

(2) A child of between thirteen years of age and sixteen years of age may be employed to perform light work which is

(a) Not likely to be harmful to the child's health or development; and

(b) Not such as to prejudice the child's attendance at school, his participation in vocational orientation or training Programs approved by Minister or his capacity to benefit from the instructions received.

Relevance

The proponent and the contractor shall need to understand the requirements of the Act during employment. Equal opportunity should be given to all both men and women so as to ensure equity.

5.3.15 Work Injury Benefits Act (WIBA)

It is an act of Parliament to provide for compensation to workers for injuries suffered in the course of their employment. It outlines the following:

- Employer's liability for compensation for death or incapacity resulting from accident;
- Compensation in fatal cases;
- Compensation in case of permanent partial incapacity;
- Compensation in case of temporary incapacity;
- Persons entitled to compensation and methods of calculating the earnings;
- No compensation shall be payable under this Act in respect of any incapacity or death resulting from a deliberate self-injury;
- Notice of an accident, causing injury to a workman, of such a nature as would entitle him for compensation shall be given in the prescribed form to the director.

Relevance

The Contractor shall need to abide by all the provisions of WIBA.

5.3.16 The National Museums and Heritage Act-Cap 216 (2006)

Kenya is rich in its antiquities, monuments, cultural and natural sites which are spread all over the country and the Act aims to preserve this national heritage.

The National Museums of Kenya is the custodian of the country's cultural heritage, its principal mission being to collect, document, preserve and enhance knowledge, appreciation, management and the use of these resources for the benefit of Kenya and the world.

Through the National Museums of Kenya many of these sites are protected by law by having them gazetted under the Act.

- Section 30 of the Act requires all discoveries of buried artefacts to be reported to the NMK/GoK.

Relevance

In case of discoveries of buried artefacts reporting to the NMK/GoK will be carried out.

5.3.17 Environmental and Land Court Act) 2011)

The Act gives effect to Article 162(2) (b) of the constitution by establishing the Environment and Land Court that has original and appellate jurisdiction. Per Section 4(2) and (3), it is a court with the status of the High Court. It exercises jurisdiction throughout Kenya and pursuant to section 26, is expected to ensure reasonable and equitable access to its services in every County.

The principal objective of this Act is to enable the Court to facilitate a just, expeditious, proportionate and accessible resolution of disputes governed by the Act.

The Court exercises its jurisdiction under Section 162 (2) (b) of the Constitution and has power to hear and determine dispute relating to: a) Environmental planning and protection, climate issues, land use planning, title, tenure, boundaries, rates, rents, valuations, mining minerals and other natural resources; b) Compulsory acquisition of land ;c) land administration and management ;d) Public private and community land contracts, choses in action or other instrument granting any enforceable interests in land and e) any other dispute relating to environment and land.

Nothing in the Act Precludes the Court from hearing and determining applications for redress of a denial, violation or infringement of, or threat to, rights or fundamental freedom relating to land and to clean and healthy environment under Section 42, 69 and 70 of the constitution.

Relevance

Grievances encountered during implementation of the project will be resolved using the GRM proposed in Subsection 8.5 and 8.6 of this report. Those not satisfied will be advised to seek justice through the environmental Court

5.3.18 Sustainable waste Management Act, 2022;

The new Sustainable Waste Management Act (SWMA) ushers a new era in waste management in Kenya whereby a linear model is discarded and a circular model of waste management is embraced. The Act provides for new governance framework in waste management with establishment of Waste Management Council, expanded role of County Governments and Extended Producer Responsibility Schemes. In addition, the Act prescribes the need to establish new infrastructure for waste management such as segregation at source, proper transportation, material recovery facilities, and closure of dumpsites, sanitary landfills, and national waste information system.

Relevance

The Contractor shall need to abide by this provision.

5.3.19 Urban Areas and Cities Act, 2011.

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; to provide for the criteria of establishing urban areas, to provide for the principle of governance and participation of residents and for connected purposes

Relevance

The proposed interventions shall be aligned with the development plans and strategies of the county governments. The project team shall abide to the requirements stipulated in this Act.

5.3.20 National Construction Authority (NCA) 2011

The National Construction Authority (NCA) is a state corporation, established under the National Construction Authority Act No. 41 of 2011, with the mandate to oversee the construction industry in Kenya and coordinate its development. National Construction Authority (NCA) is a statutory body whose main function is to regulate, streamline and build capacity in the construction industry.

Relevance

The Contractor shall acquire necessary permits and licenses during the construction period. The Contractor shall abide to the rules and regulations stipulated in this Act.

5.4 Tharaka Nithi County Government Relevant Legislations and Policies

5.4.1 Tharaka Nithi Gender Main Streaming Policy 2019

Tharaka Nithi County Government, the Department of Education, Youth, Gender, Culture and social Services key responsibilities is to promote gender, youth and women empowerment. The Department has spearheaded the development of this gender mainstreaming policy in line with the County Government vision of A Prosperous, Industrialized and Cohesive County. The policy outlines the county agenda for gender equality, women empowerment and inclusivity. It further spells how these aspirations will be realized. It details the overarching principles, which will be adopted and integrated into the County Government sectoral policies, practices and programme including activities undertaken by non-state actors.

Relevance to the Project

The project team will ensure equity in development opportunities for both females and males. A critical factor in promoting socio-economic growth and productivity, increased individual earnings and, subsequently reduced income inequalities and the reduction of poverty.

5.4.2 Tharaka Nithi County Climate Change Fund Act 2019

This Act was established to facilitate and coordinate financing of Climate Change Adaptation and Mitigation activities; and for connected purposes.

Section 24(1) of this act states The County Planning Committee shall develop and publish an eligibility criterion for Climate Finance projects that will be eligible for funding under this Act. (2) The eligibility criteria in subsection (1) above shall be based on the following parameters —

- a) Activities or initiatives that promotes climate resilience in the locality through Climate Mitigation or Adaptation;
- b) Activities or initiatives that supports economic growth through low carbon climate resilient development;
- c) benefit a large number of people including vulnerable groups and have clear considerations for gender representation;

Relevance to the Project

The project will mainstream climate resilience in Marimanti infrastructural projects through its designs, material used and general project activities. Detailed explanation on mainstreaming climate resilience has been discussed in Chapter 2 section 2.8 of this report

5.4.3 Tharaka Nithi County Traffic and Transport Management Bill, 2020

Part IV of this Act on Public Transport and Traffic highlights the following:

Section 25 (1): The Directorate shall install traffic and street lights within the County;

Section 25 (2): The Directorate shall be responsible for the maintenance of traffic and streetlights;

Section 26 No person shall will fully or negligently cause damage to a traffic light or streetlight and a person who contravenes this section commits an offence

Relevance to the Project

The project shall involve the installation of street lighting within the settlement. The Proponent; County Government of Tharaka Nithi shall be responsible for the maintenance of traffic and streetlights.

The project shall ensure existing street lighting is not affected during project implementation.

5.4.4 Tharaka Nithi County Public Nuisances Bill, 2019

This is an Act of Tharaka Nithi County Assembly to provide for the regulation and management of public nuisances including air and noise pollution and for connected purposes.

Relevance to the Project

The project shall adhere to the regulations and requirements stipulated in this Bill. All permits and licenses shall be acquired from the County Government

The project shall ensure mitigation measures are put in place to ensure the project activities lead to minimal air and noise pollution impacts within the settlement.

5.4.5 Tharaka Nithi County Youth Empowerment Act, 2020

This is an Act of the County Assembly of Tharaka Nithi to empower, improve and develop the youth as well as establishing a fund to provide access to capital and financing facilities through loans, grants and for connected purposes

Relevance to the Project

The project shall empower the youth within the settlement though creation of job opportunities. Income earned will contribute in improving the standards of living for the youths within the settlement.

5.4.6 Tharaka Nithi County Spatial Planning Bill, 2016

The purpose of this Act is to provide for a legal framework for preparation and implementation of county spatial plans and related development plans as provided for under section 8 of Part 2 of the Fourth Schedule to the Constitution of Kenya, Part XI of County Governments Act, 2012 and Urban Areas and Cities Act, 2012 in order to:

- a) Coordinate spatial planning and development;
- b) Promote organized planning and development of physical infrastructure;
- c) Enhance regulation of physical development and land use;
- d) Promote effective and transparent physical planning process;
- e) Promote sustainable social economic development

Relevance to the Project

The project shall adhere to the stipulated regulations of this Act. Engagement with the County Government shall be carried out throughout the planning, implementation and operation phases to ensure project activities are in line with the Acts guidelines.

5.5 World Bank Operational Safeguard Policies

Like in any project financed by, or with financial participation of, the World Bank, the environmental and social safeguards as defined in the Bank's Operational Procedures (OPs) will be respected for the purposes of this project implementation. Applicability of the safeguard policies to the project is discussed in the following sub sections.

5.5.1 Operational Policy 4.01: Environmental Assessment

The Operational Policy on Environmental Assessment (OP 4.01) is applied by the World Bank to identify, avoid, and mitigate the potential negative environmental and social impacts associated with Bank lending operations. The purpose of Environmental Assessment is to provide guidance for environmental and social assessment of the WB financed projects, improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted. The proposed interventions, road upgrading, water reticulations and household connections will have significant impacts within and around Marimanti informal settlement project area in all phases including, change in the landscape not just at the quarry or borrow sites (loss of materials), establishment of secondary businesses , influx of new populations in search of new opportunities, interference with existing ways of life, GBV, increased conflicts, pressure for increased demand on existing resources, increase in traffic during the operation phase leading to an increase of foreign members to the community. This Environmental and Social Impact Assessment (ESIA) and environmental and social management plan (ESMP) has been carried out to fulfill the requirements of this policy. In addition, at least consultations have been carried out with project affected people and other stakeholders (during the design engineer, ESIA preparation and the disclosure requirements).

5.5.2 Operational Policy 4.11-Physical Cultural Resources

This policy guides in preserving physical cultural resources and helps reduce chances of their destruction or damage. The policy considers Physical Cultural Resources (PCR) to be resources of archaeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic or other cultural significance. This policy applies to all projects requiring a Category A or B Environmental Assessment under OP 4.01, projects located in, or in the vicinity of, recognized cultural heritage sites. There is a potential of the project affecting some of these sites, whose exact location is unknown as such a "Chance Find Procedures", has been presented in Annex 4 of this report.

5.5.3 The Bank's Operational Policy 4.12: Involuntary Resettlement

The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative project designs to avoid resettlement. This policy is applicable in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and

protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

The policy advocates for the participation of displaced/affected persons in the resettlement planning and implementation process with the objective of ensuring that the livelihoods of affected persons are restored to levels that are better than or equal to their former living standards

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to project appraisal of proposed projects.

The policy provides for the preparation of appropriate and accessible grievance mechanisms for such affected persons so as to offer an avenue where they can register complaints and solutions provided. A Grievance Redress Mechanism (GRM) for this project has been prepared and included in section 8.5 and 8.6 of this report.

5.5.4 World Bank Directive on Vulnerable Groups

The project area has no marginalized communities. The term “vulnerability” refers to those individuals or groups who, by virtue of, for example, their age, gender, ethnicity, religion, physical, mental or other disability, social, civic or health status, sexual orientation, gender identity, economic disadvantages or indigenous status, and/or dependence on unique natural resources, may be more likely to be adversely affected by the project impacts and/or more limited than others in their ability to take advantage of project benefits

Such an individual/group is also more likely to be excluded from/unable to participate fully in the mainstream consultation process and as such may require specific measures and/or assistance to do so. This will take into account considerations relating to age, including the elderly and minors, and including in circumstances where they may be separated from their family, the community or other individuals upon whom they depend.

5.5.5 World Bank Policy on Access to Information, 2010

The World Bank policy on access to information sets out the policy on public access to information in its possession. This Policy supersedes the World Bank Policy on Disclosure of Information, and took effect on July 1, 2010.

This Policy is based on five principles:

- Maximizing access to information.
- Setting out a clear list of exceptions.

- Safeguarding the deliberative process.
- Providing clear procedures for making information available.
- Recognizing requesters' right to an appeals process.

In disclosing information related to member countries/borrower in the case of documents prepared or commissioned by a member country/borrower (in this instance, safeguards assessments and plans related to environment, resettlement, and indigenous peoples, OP/BP 4.01, Environmental Assessments, OP/BP 4.10 and OP/BP 4.12 Involuntary Resettlement); the bank takes the approach that the country/borrower provides such documents to the Bank with the understanding that the Bank will make them available to the public.

5.6 World Bank GROUP Environmental, Health and Safety (EHS) Guidelines

The Environmental, Health and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. These General EHS Guidelines are used in addition to the local guidelines in order to provide mitigation measures for the various environmental and social impacts that will be identified in this report. The main EHS guidelines that will be used alongside local policies include:

- Environmental Guidelines
- Occupational Health and Safety Guidelines
- Community Health and Safety Guidelines
- Construction and Decommissioning Guidelines

5.6.1 Environmental Guidelines

These guidelines will govern the Contractor's activities during the construction of the road, elevated water tank, water reticulation and household connections and the construction works impacts on the physical environment.

The guidelines include:

- a) **Air Emissions and Ambient Air Quality** – which provide the air quality standards, limits and monitoring requirements for construction works. The guidelines incorporate WHO air quality guidelines on the major air pollutants expected from the Contractor's machinery and equipment.

b) **Wastewater and Ambient Water Quality** – These guidelines will be key particularly in the Contractor's camp and the impacts of wastewater generation and treatment before release into the environment, in order to prevent pollution of the surrounding physical environment. The contractor should ensure they connect the campsite to the existing sewer network have to establish onsite treatment of waste water, proper channeling of storm water to prevent contamination of the physical and social environment. The guidelines call for monitoring of wastewater from the site through testing and inspections for which the Contractor will have to establish a plan for management and monitoring.

c) **Waste Management** – All construction works are expected to produce one or more forms of waste. The construction of the road, water and reticulation networks will be of no exception. Construction wastes and Domestic wastes are expected from the Contractor's site as well as the camp. The Contractor will have to prepare a waste management plan using these guidelines that conform to the local legal framework provided in this chapter.

d) **Noise** – Use of several equipment and plant is bound to generate some level of noise, which are bound to have a negative impact on the surrounding environment and in particular sensitive receptors (human settlements and wildlife). These impacts will be short-lived during the construction phase of the project. The guidelines also provide the maximum noise levels, provided in the Noise and Excessive Vibration Pollution Control Regulations – Schedule 1-3, which the Contractor should strive to adhere to. The guidelines also call for baseline and annual monitoring of noise generation within the Contractor's site to establish compliance to the guidelines and local regulation.

5.6.2 Occupational Health and Safety Guidelines

These guidelines are geared towards ensuring the safety of the staff on site and within the Contractor's camp. The guidelines with regards to occupational health and safety include:

a) **General Facility Design and Operation** – These guidelines will guide the Contractor's workspace. The Contractor will have to provide suitable potable water supply for the staff, suitable lavatories, fire precaution measures (extinguishers and safety drills) and first aid services.

b) **Communication and Training** – This will provide for communication and training of staff and visitors to the site, to govern behavior within the site. This is necessary to ensure safety while operating within the site. The Contractor will need to employ a health and

safety officer fulltime on site who will be in charge of ensuring safety and communication of safety within the site.

- c) **Physical Hazards** – These guidelines will govern the exposure of the workers to physical dangers including excavation sites, bridge sites, noise, dust, welding, manual handling, work environment temperatures. The guidelines provide fall protection when working at height and work hour limits (8 hours' maximum).
- d) **Personal Protective Equipment (PPE)** - Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. The Contractor will have to provide the relevant PPE for staff on site for the different job descriptions. In addition, visitors to site will have to be provided with some minimal form of PPE during their visits.
- e) **Monitoring** - Occupational health and safety monitoring programs should verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The Contractor will have to employ a health and safety officer who will come up with an occupational health and safety monitoring program for implementation by the Contractor. In addition, the Contractor will provide a clinic and log of accidents and incidences on site as a control measure for ensuring health and safety.

5.6.3 Community Health and Safety Guidelines

These guidelines complement the environmental, social and occupational health and safety guidelines. The guidelines specifically address the impact of the project activities on the surrounding community. They involve the following aspects:

- i. **Structural Safety of Project Infrastructure** – Construction works, works on borrow/quarry sites may pose a risk to the surrounding communities. As such safety measures have to be taken into account. The Contractor will have to provide physical buffers such as cordons to prevent falls into the pits, road signage, establishment of speed limits, water spraying to ensure the safety of the community.
- ii. **Traffic Safety** – The project road will still be under use during construction. As such the Contractor will have to provide a traffic management plan in order to ensure safety of motorists and other road users. The traffic management plan will include alternative diversion routes and a traffic controller to divert traffic and road signage.

- iii. Emergency Preparedness and Response – These are designed to deal with events and acts that are unplanned when a project operation loses control, or could lose control, of a situation that may result in risks to human health, property, or the environment, either within the facility or in the local community. Emergencies do not normally include safe work practices for frequent upsets or events that are covered by occupational health and safety. The Contractor will prepare an emergency preparedness and response plan, including training of staff, drills to gauge responses to preparedness, and communication with the local community in case of rinse.
- iv. Disease Prevention – Some workers will be coming in from different parts of the County. There is potential that communicable diseases may be spread among the workers and community members. Communicable diseases of most concern during the construction phase due to labour mobility are sexually-transmitted diseases (STDs), such as HIV/AIDS. Contractor is to undertake health awareness and education initiatives. Promoting individual protection, and protecting others from infection, by encouraging condom use.

5.6.4 Construction and Decommissioning Guidelines.

These guidelines govern the project components that require decommissioning including the material sites and camp. The Contractor will prepare a decommissioning plan for all these features taking into account the EHS guidelines as mentioned above

5.7 Applicability of World Operational Safeguards

Table 5-1 shows the applicability of World Operational Safeguards to the proposed improvement works in Marimanti informal settlement

Table 5:1: Summary of Applicability of World Operational Safeguards

OP	Title	Comments
4.01	Environmental Assessment	Applicable. As a result of environmental and social screening, (Annex 6) the project was identified as a Category B project due potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures and other activities, as described
4.04	Natural Habitats	Not applicable.
4.09	Pest Management	Not applicable.
4.10	Indigenous Peoples	Not applicable.
4.11	Physical Cultural Resources	Not applicable. Several site visits conducted have not indicated the presence of any cultural (historical, archaeological) sites in the construction area. However, to manage “chance finds” an

OP	Title	Comments
		appropriate procedure is included in this ESIA (Annex 3). Such procedure to be followed by contractors during the construction phase.
4.12	Involuntary Resettlement	Not applicable
4.36	Forests	Not applicable.
4.37	Safety of Dams	Not applicable.
7.50	Projects on International Waterways	Not applicable.
7.60	Projects in Disputed Areas	Not applicable.

The relevant International Labour Organization (ILO) Conventions that will be applicable to the Project are listed below:

- (i) ILO Convention 87 on Freedom of Association and Protection of the Right to Organize
- (ii) ILO Convention 98 on the Right to Organize and Collective Bargaining
- (iii) ILO Convention 29 on Forced Labour
- (iv) ILO Convention 105 on the Abolition of Forced Labour
- (v) ILO Convention 138 on Minimum Age (of Employment)
- (vi) ILO Convention 182 on the Worst Forms of Child Labour
- (vii) ILO Convention 100 on Equal Remuneration
- (viii) ILO Convention 111 on Discrimination (Employment and Occupation)
- (ix) UN Convention on the Rights of the Child, Article 32.1
- (x) UN Convention on the Protection of the Rights of all Migrant Workers and Members of their Families

The Project Contractor shall observe the Standard as presented in the ESMMP of the project to be enforced under the Works Contract.

5.8 Sustainable Development Goals

5.8.1 SDG 6: Clean Water and Sanitation

This goal aims at ensuring availability, access and sustainability to water and sanitation for all.

Relevance

The project has a component on water supply and construction of an ablution block. The project will partake in achieving the goal through the development of water and sanitation infrastructures.

5.8.2 SDG 9: Industries, Innovation and Infrastructure

This goal seeks to build resilient infrastructure, promote sustainable and resilient industrialization and foster innovation to support economic development and human well-being, with a focus on affordable and equitable access for all.

Relevance

The project will incorporate climate resilience in the design and in the infrastructure. The community members employed will gain knowledge and skills during the construction and operation stages of the project.

5.8.3 SDG 11: Sustainable Cities and Communities

This goal aims at making cities and human settlements inclusive, safe, resilient and sustainable.

Relevance

The proposed development of infrastructures such as water, roads and sanitation, will promote the economic growth of the area and investment. Availability of such infrastructures shall create wealth, improve economy and ultimately encourage more development infrastructures such as sustainable housing within the area.

5.9 Multilateral Environmental Agreement

5.9.1 Paris Agreement.

The main aim of Paris Agreement is to limit and reduce greenhouse gases (GHG) emissions in accordance with Nationally Determined Contributions (NDCs).

Relevance

The project will adhere to the air emission limits stipulated in EMCA (Air Quality Regulations) 2014 and the treaty.

5.9.2 United Nations Framework Convention on Climate Change (UNFCCC),

The main objective to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system.

Relevance

The project will adhere to the air emission limits stipulated in EMCA (Air Quality Regulations) 2014 and the treaty.

5.9.3 World Heritage Convention.

Aims to promote cooperation among nations to protect heritage around the world that is of such outstanding universal value that its conservation is important for current and future generations.

Relevance

The project will not affect cultural, archaeological, or historical heritage within the project site.

5.9.4 The Convention on Biological Diversity.

It is the international legal instrument for "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources

Relevance

The proposed project will ensure sustainable use of the available resources within the project area.

5.10 Project Implementation Institutional Structure

I. The Contractor

The contractor shall be required to establish an environmental office to continuously advise on environmental components of the project implementation. Elements in the environmental and social management plan are expected to be integrated in the project with appropriate consultations with county and National KISIP 2 team through the supervising environmental and social safeguard expert. The environmental and social expert officer of the Contractor is also expected to fully understand the engineering and management aspects of the project for effective coordination of relevant issues.

II. The Supervisor

The Consultant shall be the Contract supervisor shall ensure effective implementation of the environmental management plan. It is expected that supervisor engages the services of an environmental expert who should in return understand the details of the recommendations on environment management and especially the proposed action plans, timeframes and expected targets of the management plan. The environmental supervisor expert should also be the liaison person between the contractor, the County and KISIP 2 safeguard expert on the implementation of environmental concerns as well as issues of social nature associated with the Project.

5.11 Institutional Structure

There are various national institutions that are important in civil and road project works related to environmental management in Kenya. These are described in the subsection below:

5.11.1 Ministry of Environment, Climate Change and Forestry

The Ministry of Environment and Natural Resource is mandated to monitor, protect, conserve, and manage the environment and natural resources of the country. The Ministry is required to achieve this monumental task through sustainable exploitation of natural resources for socio-economic development geared towards eradication of poverty, improving living standards and maintaining a clean environment for present and future generations.

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

The MoTIHUD shall support implementation of the proposed interventions through State Department of Housing and Urban Development (SDHUD) and State Department for Public Works (SDPW) whose mandate is to provide policy direction and coordinate all matters related to construction, rehabilitation and maintenance of Public Buildings and Other Public Works.

5.11.3 County Government of Tharaka Nithi

The County Government of Tharaka Nithi is the project proponent and shall support implementation of the proposed interventions through Department for Lands, Housing, Physical Planning, Public Works and Urban Development (CO-LHPP&UP)

5.11.4 National Environment Management Authority (NEMA)

The government established the National Environmental Management Authority (NEMA) as the supreme regulatory and advisory bodies on environmental management in Kenya under EMCA 2015. NEMA is charged with the responsibility of coordinating and supervising the various environmental management activities being undertaken by other statutory organs. NEMA also ensures that environmental management is integrated into development policies, programs, plans and projects.

5.11.5 Water Resources Authority (WRA)

The authority is responsible for sustainable management of the Nations Water Resources:

- Implementation of policies and strategies relating to management of water resources,
- Develop principles, guidelines and procedures for the allocation of water,
- Development of catchments level management strategies including appointment of catchments area advisory committees,
- Regulate and protect water resources quality from adverse impact, and
- Classify, monitor and allocate water resources.

5.11.6 Water Services Regulatory Board (WASREB)

The regulatory Board is responsible for the regulation of the water and sewerage services in partnership with the people of Kenya. The mandate of the regulator covers the following key areas:

- Regulating the provision of water and sewerage services including licensing, quality assurance, and issuance of guidelines for tariffs, prices and disputes resolution,
- Overseeing the implementation of policies and strategies relating to provision of water services licensing of Water Services Boards and approving their appointed Water Services Providers,
- Monitoring the performance of the Water Services Boards and Water Services Providers,
- Establish the procedure of customer complaints,
- Inform the public on the sector performance, and
- Gives advice to the Minister in charge of water affairs.

5.11.7 Directorate of Occupational Safety and Health Services (DOSH)

DOSH plays a crucial role in promoting and maintaining safe working conditions for employees across various sectors. By enforcing International Labour Standards related to occupational safety and health, DOSH aims to protect workers from hazards and ensure their well-being on the job. During project implementation the Contractor shall have to engage DOSH to:

- Provides OSH permits for workplaces of the project including the campsite and
- Conduct inspections to ensure conformance to OSHA

CHAPTER 6: STAKEHOLDER CONSULTATION

6.1 Background to public consultation in ESIA

Timely, well-planned and implemented public involvement and consultation is a vital component of a successful ESIA study. The Constitution of Kenya, 2010 provides that every Kenyan has the right to have the environment protected for the benefit of the present and future generations through legislation and other measures. Article 10 and 69 of the Constitution recognizes public participation as a principle of governance and gives the state a responsibility to encourage public participation in the management, protection and conservation of the environment.

According to, EMCA Act 2015, and Environmental (Impact Assessment and Audit) (amendment) Regulations, 2019 beneficiaries and members of the public living within new or improvement project sites (both public and private) are consulted to seek their views and opinions regarding the projects before they are implemented. Consultative Public Participation is therefore an important process in ESIA studies.

Community consultation and participation ensures that communities and stakeholders are part and parcel of the proposed developments and in so doing assures the sustainable use of resources. It has also demonstrated successfully that projects that go through this process shall acquire high level of acceptance, identify possible conflicts areas early, and accrue benefits to a wider section of the society. Public consultations form a useful component for gathering, understanding and establishing likely impacts of projects determining community and individual preferences and selecting alternatives.

Furthermore, through public participation, it is possible to enhance project designs and ensure sustainability of the projects. The proposed project has incorporated public consultations in order to understand the local impacts, needs and thoughts and eventually incorporate them into the final designs and operations of the project.

6.2 Aims and Objectives of Stakeholders Consultation and Public Participation (CPP)

The aims and objectives of public involvement and consultation include:

- Informing stakeholders and members of public
- Gaining their views, concerns and values
- Taking account of public inputs in decision making
- Influencing project design
- Obtaining local knowledge
- Increasing public confidence

- Improving transparency and accountability in decision making
- Reducing conflict

6.3 Approach of Stakeholder Consultation

The process of stakeholder engagement involved the following:

- i. Stakeholder identification;
- ii. Stakeholder consultation activities
 - Planning how the engagement will take place;
 - Disclosure of information;
 - Consultation with stakeholders;
 - Addressing and responding to grievances; and
 - Reporting to stakeholders.

6.3.1 Stakeholder mapping

The identification of stakeholders for this Project followed the procedures outlined in the Environmental Management and Coordination (Amendment) Act 2015, Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019 Guidelines, the Constitution of Kenya 2010, World Bank Operation Policy of Environment Assessment and Land Acquisition and Involuntary Resettlement guidelines. The guidelines require Stakeholder Engagement through consultation with the affected people and/or their community representatives and Non-Governmental Organizations (NGOs).

In order to meet best practice approaches, the following principles were applied for stakeholder engagement:

- **Openness and life-cycle approach:** public consultations for the project were carried out in an open manner, free of external manipulation, interference, coercion or intimidation;
- **Informed participation and feedback:** information was provided to and widely distributed among all stakeholders in an appropriate format; opportunities were provided for communicating stakeholders' feedback, for analysing and addressing comments and concerns;
- **Inclusiveness and sensitivity:** stakeholder identification was undertaken to support better communications and build effective relationships. The participation process for the projects was inclusive. Equal access to information was provided to all stakeholders.
- **Cultural appropriateness.** The format, timing and venue respected local customs and norms.

- **Gender sensitivity.** Consultations were organized to ensure that both women and men had equal access to them.

The key stakeholder groups identified, consulted and informed about the project are presented in **Table 6-1**.

Table 6:1: Stakeholder Inventory

No	Name	Category
1.	Assistant County Commissioner /Deputy County Commissioner	National Government
2.	Physical planning – Urban Planner	County Government
3.	Surveyors	
4.	KISIP SEC and GRC officials	Settlement level
5.	Town administrator	County Government
6.	Chief	National Government Administration
7.	Religious leader	Resident
8.	Residents	Community members

6.3.2 Stakeholder Consultation Activities

Public consultation is useful for gathering environmental data, understanding likely impacts, determining community and individual preferences, selecting project alternatives, and designing viable and sustainable mitigation and compensation plans.

The consultations will take place throughout the planning phase and continue during the construction and operational phases of the project.

Table 6-2 presents an overview of the stakeholder activities that were/will be undertaken during the stakeholder engagement

Table 6:2: Stakeholder Consultation Activities

Phase	Activities
Phase 1: Stakeholder identification and preliminary consultation/scoping	<ul style="list-style-type: none"> • Stakeholder identification and categorization during the Project inception exercise • Preliminary consultation: liaison with National, County, and Local Institutions • Identification of key Project constraints
Phase 2: Information distribution and introductory Meetings	<ul style="list-style-type: none"> • Distribution of specialists and technical Information to the County Government of Tharaka-Nithi, County administration, and other relevant stakeholders • Introductory meetings with local administration, Sub-Counties

	administrators and ward administrators, and relevant authorities.
Phase 3: Impact Identification and Development of Mitigation Measures	<ul style="list-style-type: none"> Meetings with Local Administration in affected locations Meetings and conducting Key Informant Interviews with members of sub-county and Ward administrators within the settlement Conducting interviews and household interviews with the community members Dialogue and meetings with the above-identified stakeholders
Phase 4: Disclosure of the draft EIA	<ul style="list-style-type: none"> Submission of ESIA Project Report to National Environment and Management Authority (NEMA) and world bank Circulation of Project Report by NEMA to relevant Lead Agencies Review and Incorporation of Lead Agencies' comments and revisions to ESIA Collection and incorporation of comments and feedback. Issuance of license
Phase 6: consultation during construction and operation	<ul style="list-style-type: none"> Throughout the Project

6.4 Stakeholder Consultation

The main key informants targeted in the consultations were both Government and private institutions operating within the project area. Listening to stakeholder concerns and feedback is a valuable source of information that can improve project design and outcomes and help in identifying any impacts.

A consultation meeting was held on September 28, 2023 at Marimanti Social Hall (photographs taken presented in Figure 6-1) where the following stakeholders were present;

- Area chief Area residents and villager elders
- Ward administrator
- Business men/women
- Window/widower
- Land owner's representatives
- Landlords/land lady's
- Tenants representatives
- People living with disabilities
- KISIP 2 National team
- KISIP 2 County team



Figure 6- 1: Photographs taken during Stakeholder Consultation

Gathering the residents to the meeting venue was undertaken through the close coordination of the KISIP county coordinator together with the local administrator (chief and ward administrator). Communication on the date, venue and purpose of the meeting was done a week prior to the actual date of the meeting

The discussion including project information was discussed in Kiswahili and Meru languages to ensure the community understood the project scope, objectives and anticipated impacts in all project phases

Outcomes of the meeting

- Project information was disclosed to the communities by the KISIP project coordination and County teams,
- The project team was introduced to the community
- The Settlement Executive Committee (SEC) and Grievance Redress Committee (GRC) were selected and
- Priority projects for the informal settlement were selected.

6.4.1 Interviews

A structured questionnaire was also administered to the members of public and key stakeholders in November 21, 2023 to solicit views regarding the project as well as its design. The questionnaire initially gave introduction and created awareness to the respondents regarding the project. Afterwards, questionnaire enquired on acceptance of the project and rating of the current water supply and anticipated negative impacts and suggested mitigation measures as well as any suggestions and recommendations. The analysis of the output from the stakeholder's questionnaires is discussed below:

Table 6:3: Stakeholder Consultation comment and responses

Name	Designation	Comment	Response
Elijah Sironka	Assistant County Commissioner	The ACC wanted for continuous public participation to be conducted to sensitize members of the community about the Project	The Consultant stated that there will be continuous public participation meeting to sensitize the Community
Raffina Kathure	Urban Planner	Mr. Raffina Kathure wanted to know measures that will be put in place to conserve energy	The consultant stated that the measures to be put in place for conserving energy will be put in place such measures include switching of lights during the day among others.
Moses Muriithi	Surveyor	Mr. Moses Muriithi wanted during the Project implementation phase for workers to be taught on PPE usage	The Consultant stated that a Safety Management Plan will be formulated, and the Contractor will follow the plan
Rev George Mwabu	SEC chairman	Mr George Mwabu wanted first priority during labour recruitment to be given to the local community	First priority during labour recruitment will be given to the local people for both skilled and non-skilled workers. The Contractor will liaise with the Chiefs to give notices and advertisements within the settlement
		The project should ensure public participation is done throughout all project phases	All the stakeholders will be engaged throughout all project phases. Local administration and the SEC officials will assist in the mobilization and conveying information within the settlements
		Mr. George wanted to know mitigation measures put in place to control labour influx that may result in population increase Mr. George wanted to know measures put in place to prevent impacts such as competition over resources.	Population increase may result from labour influx however majority of the workers will be recruited from the settlement. Such an impact is expected to be low. The project will ensure fair, equitable and sustainable use of available resources within the settlement
John	Senior Chief	The project should involve all	All the stakeholders will be engaged

Name	Designation	Comment	Response
Muchiri		stakeholders in all project phases	throughout all project phases. Local administration and the SEC officials will assist in the mobilization and conveying information within the settlements
		<p>The project should establish a project management committee</p> <p>The project will result in positive impacts such as:</p> <ul style="list-style-type: none"> • Creation of job opportunities • Open market linkages from the upgrading of roads • Improved security 	<p>There is already an established Settlement Executive Committee (SEC) and Grievance Redress Committee (GRC) to act as an interface between the community and project; and resolve any resulting grievances.</p>
Charles Munene Nyaga	Town Administrator	<p>The project should ensure minimal cutting of trees</p> <p>The proposed project will benefit the community and will lead to:</p> <ul style="list-style-type: none"> • Improved accessibility • Proper waste management • Improved security from the installation of security lights 	<p>There will be minimal loss of vegetation within the proposed sites. Reinstatement of the project sites to their original after completion of civil and road works will be carried out</p> <p>The Contractor shall adhere to the delineated construction work area.</p>

6.4.2 Output of the questionnaire administered to members of the public

A descriptive research design was adopted in which both quantitative and qualitative approaches were used. The estimated number of households in the settlement was considered in reference to Kenya population and housing census 2019 data and was used to determine the sample size for each settlement. A comprehensive survey encompassing a total of 90

respondents was conducted within the informal settlement. Random stratified sampling was used in data collection to ensure an equal chance for all persons within the settlement and project area to respond to the survey. A structured open ended and closed ended questionnaire was developed and used to collect data from the respondents within the settlement.

Following the data collection, the analysis ensued, integrating both qualitative and quantitative methodologies. Descriptive data were analyzed and presented through pie charts and graphical representations as highlighted below:

a) Number of years lived in Marimanti

The majority of the household head accounting for forty-two percent (42%) has over 15 years of residency in Marimanti. As presented in the **Error! Reference source not found.** below, twenty-four percent (24%) of respondents have lived in Marimanti for 6-10 years, seventeen percent (17%) for 11-15 years and sixteen percent (16%) for 0-5 years.

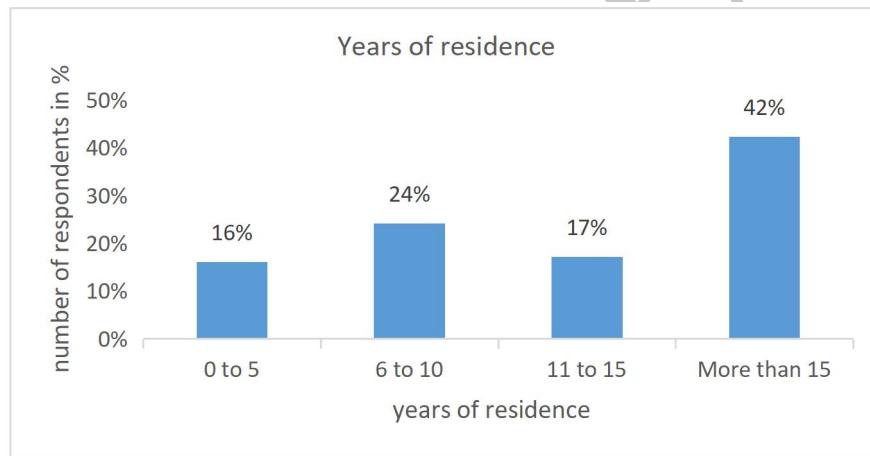


Figure 6- 2: Distribution of years lived in Marimanti

b) Main Occupation

Forty percent (40%) of the house hold heads are business persons, thirty-two percent (32%) are unemployed, 12% are employed civil servants, twelve percent (12%) are students and furthering their studies, four percent (4%) are employed by private entities. None of the HH are water vendors or are too old to work.

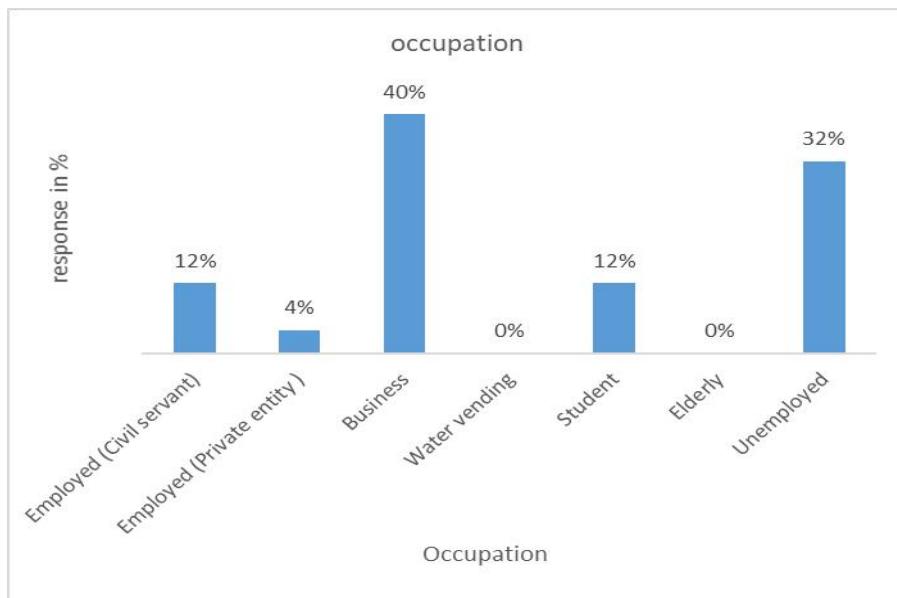


Figure 6- 3: Main Occupation of the Household Head

c) Education level

The highest level of education attained by household heads within the settlements is tertiary/university by 30% of the heads. Majority have attained secondary level of education (40%), 21% have attained primary level of education while the rest forming the minority (9%) did not attend any school as presented in Figure 6-4.

Thirty percent (30%) of the household heads in the settlements have completed post-secondary or university education. Forty percent (40%) have completed secondary education, twenty-one percent (21%) have completed primary education, and the remaining minority nine percent (9%), did not complete any schooling.

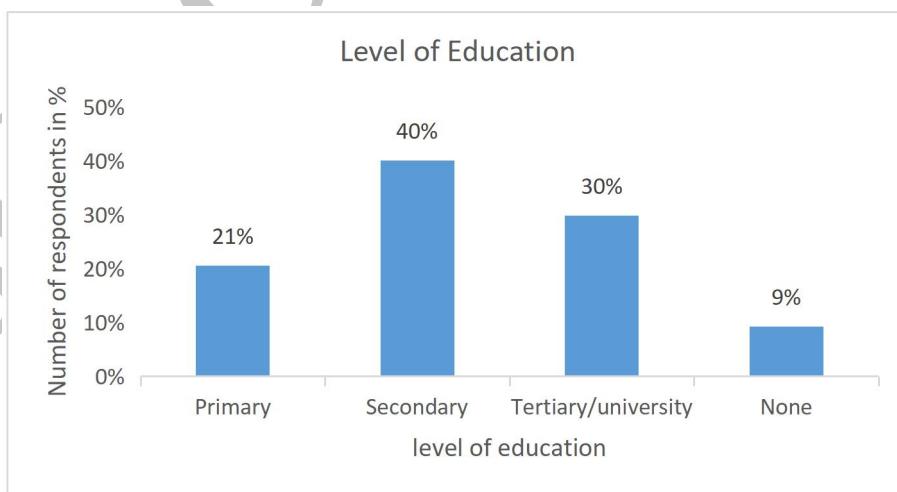


Figure 6- 4: Education distribution of the household head

d) Status of Water

Majority (56%) of the respondents showed that the water status in these areas was poor. Thirty-three percent (33%) stated that the status of water in these areas was fair while eleven percent (11%) stated that the water in these areas was good. The distribution is shown in the figure below.

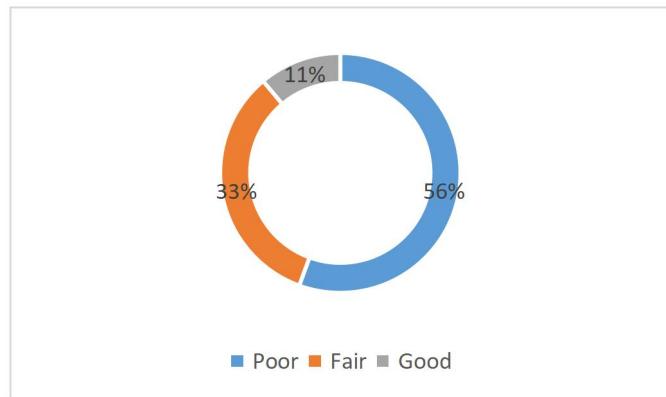


Figure 6- 5: Status of Water in Marimanti

e) Status of Sanitation

Sixty percent (60%) of the respondents showed that the sanitation status in these areas was poor, while forty percent (40%) stated that the sanitation in these areas was fair. The distribution is shown in the Figure 6-6.

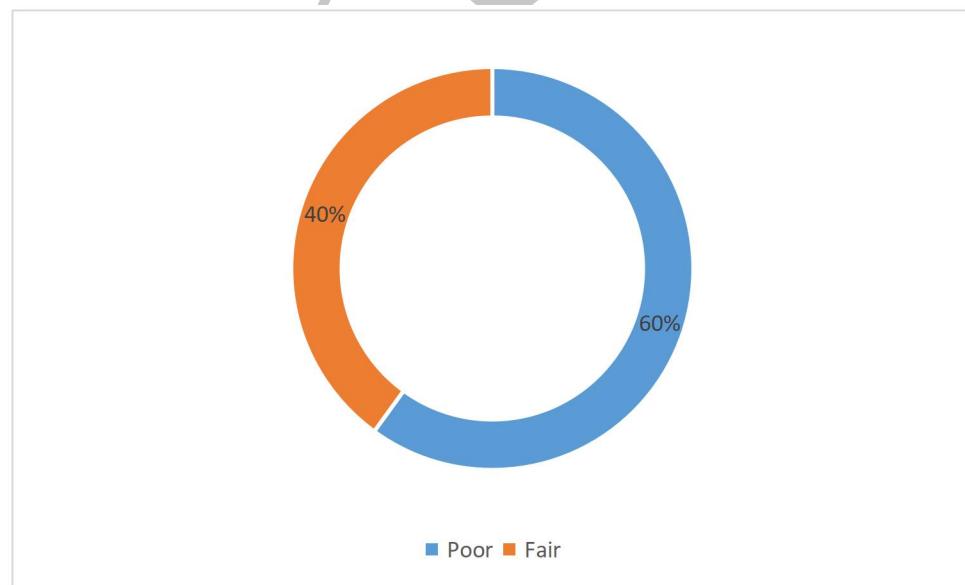


Figure 6- 6: Status of Sanitation in Marimanti

f) Status of Solid waste management

Majority (70%) of the respondents showed that the waste management status in these areas was poor, while thirty percent (30%) stated that the waste management in these areas was fair. The distribution is shown in the Figure 6-7.

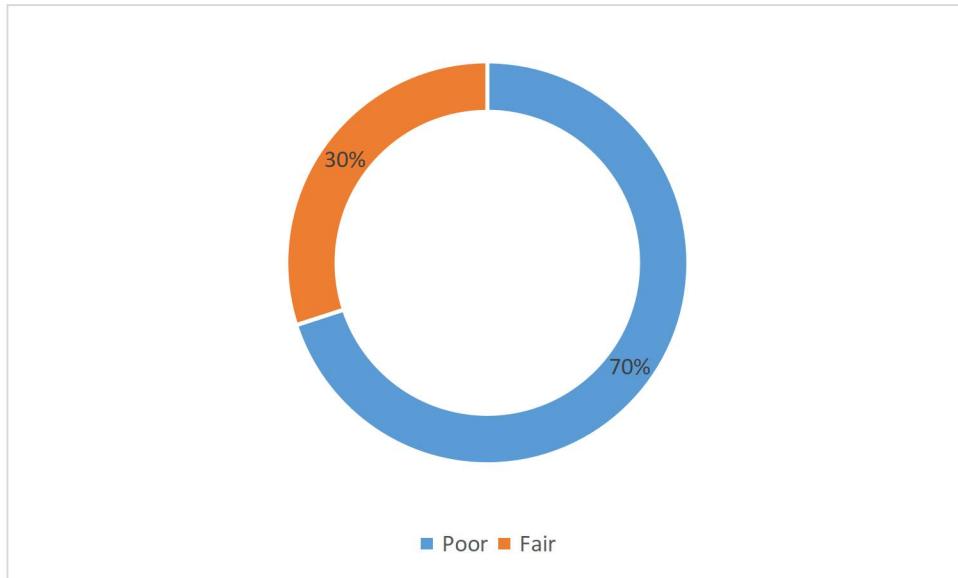


Figure 6- 7: Status of solid waste management

g) Status of Roads

Majority (70%) of the respondents stated that the road condition in these areas was poor, while twenty percent (30%) stated that the road condition in these areas was fair. The distribution is shown in the Figure 6-8.

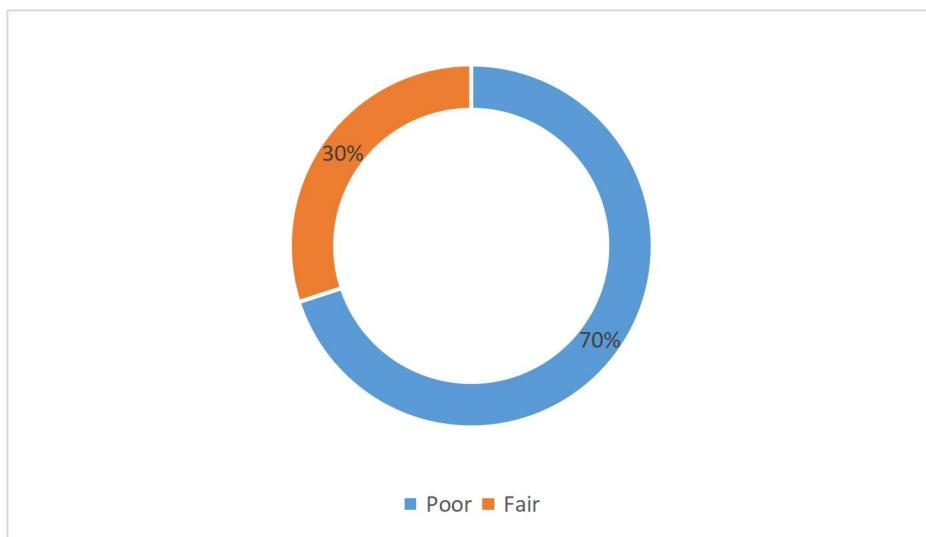


Figure 6- 8: Status of Road

h) Security

Majority (60%) of the respondents stated that the security in these areas was poor, thirty percent (30%) stated that the security status in these areas was fair, while the minority (10%) stated that the security status was good. The distribution is shown in Figure 6-9.

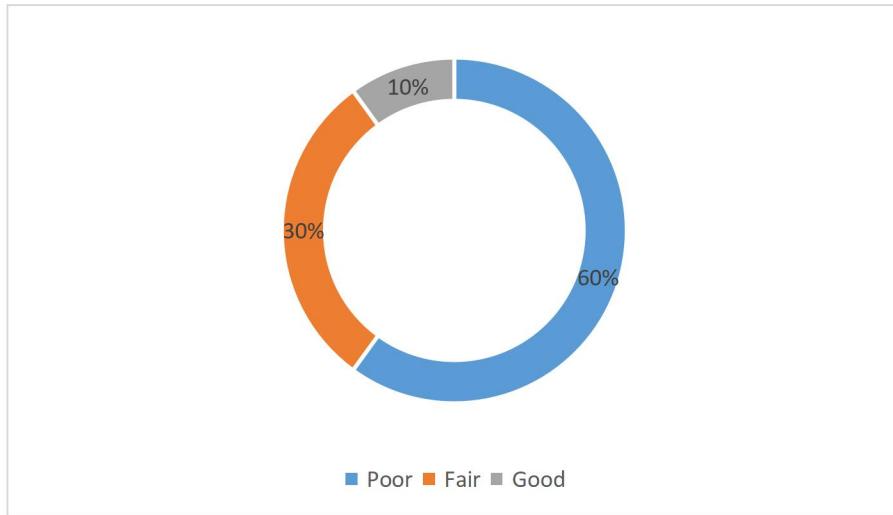


Figure 6-9: Security Status

i) Water usage

All (100%) use their water for domestic purposes such as bathing and cleaning.

j) Challenges faced in access to water

According to fifty-one percent (51%) of the households, the reason why their sources of water are unreliable is because the water is insufficient. According to thirty-one percent (31%) of respondents, their sources of water is typically dirty, nine percent (9%) said the water source is too far away and four percent (4%) said the water supply is typically turned off if payment is late as shown in the Table 6-4;

Table 6-4: Water challenges within the settlement

Reason for unreliability	Number of respondents in %
Not adequate	51
The water is dirty	31
The water source is too far	9
Leaking pipes	5
Water is cut off due to delayed payment	4

k) Sanitation facilities

The distribution is shown in Figure 6-10. Plot-based latrines comprise forty-nine percent (49%) of the households' sanitation facilities. Ten percent (10%) use public restrooms, eight percent (8%) use pit latrines, three percent (3%) use individual sewer-connected toilets, two percent

(2%) use individual septic-connected toilets and fifteen percent (15%) use plot-based septic-connected toilets. Not a single household practices open defecation or uses bucket toilets or public toilets or are connected to the sewer system.

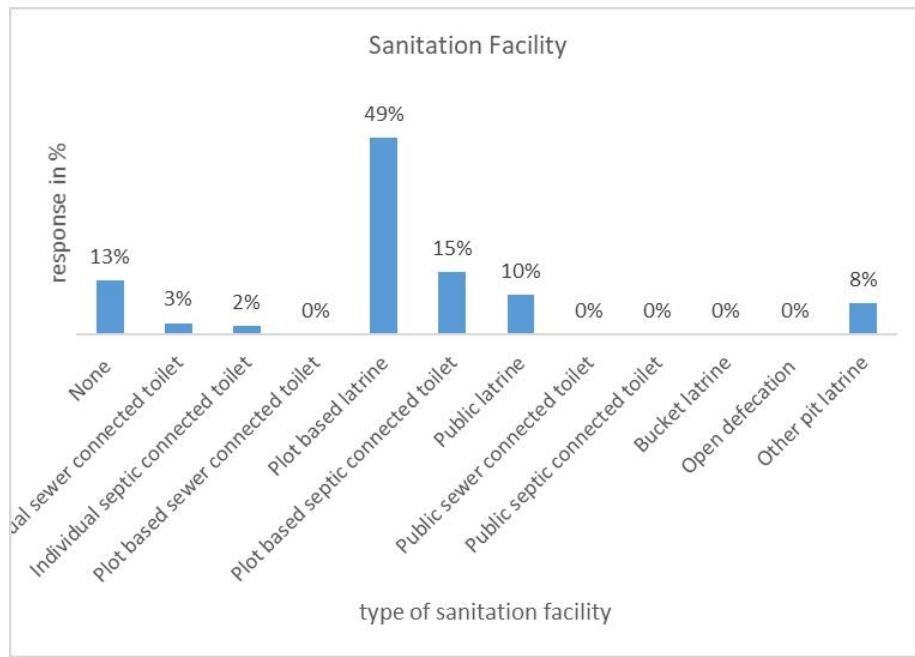


Figure 6- 10: Types of sanitation facilities in the area

I) Security concerns

Sixty-nine percent (69%) of the households in the majority of the areas report having security issues, while thirty-one percent (31%) report not having any. The area's primary security concerns are as follows: twenty-nine percent (29%) of recorded crimes are violent crimes, twenty-six percent (26%) are pickpocketing's, twenty-four percent (24%) are drug abuse crimes, thirteen percent (13%) are sexual assault crimes, four percent (4%) are burglaries and thefts and three percent (3%) are acts of ethnic violence.

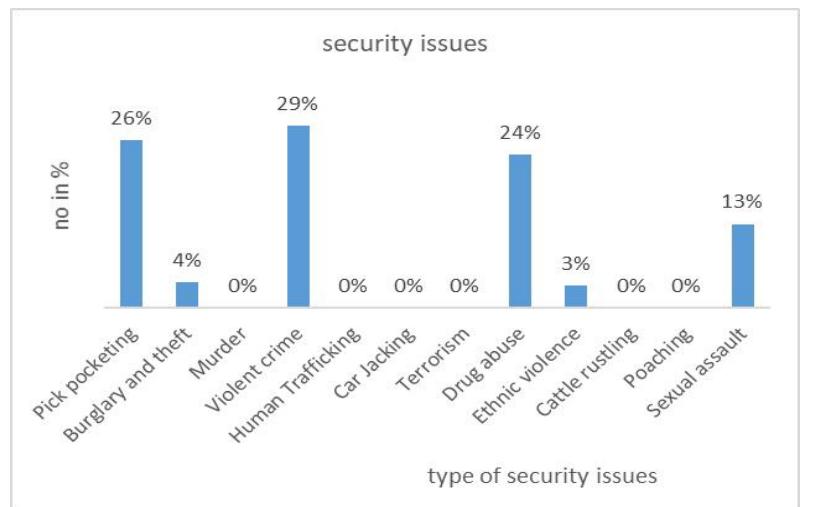


Figure 6-11: Type of security issues

m) Status of roads

The following describes the condition of the roads: twenty-eight percent (28%) lack pedestrian pathways, thirty-one percent (31%) lack drainage, twenty-six percent (26%) are dusty, fourteen percent (14%) have potholes and one percent (1%) are in good condition.

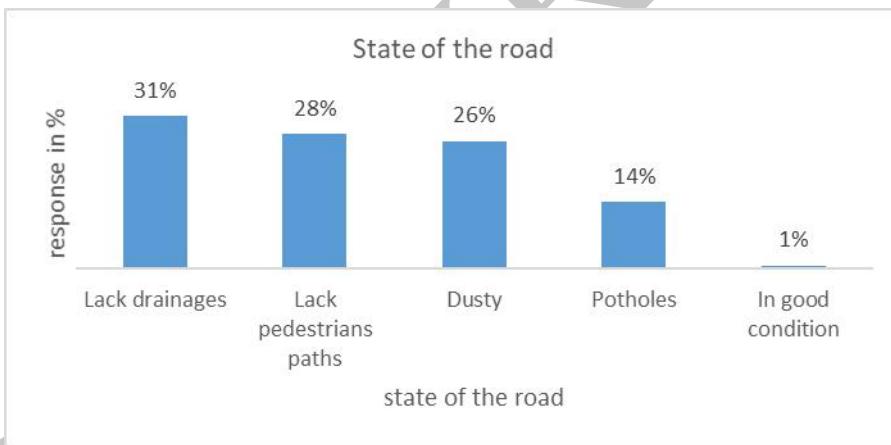


Figure 6-12: Road use Challenges

n) Solid waste disposal method

The typical method of disposing of waste is as follows: fifty-seven percent (57%) of households dump their waste in open spaces, twenty-seven percent (27%) have their waste picked up by county garbage collection, fourteen percent (14%) burn their waste, and two percent (2%) place their waste in the toilet or latrine.

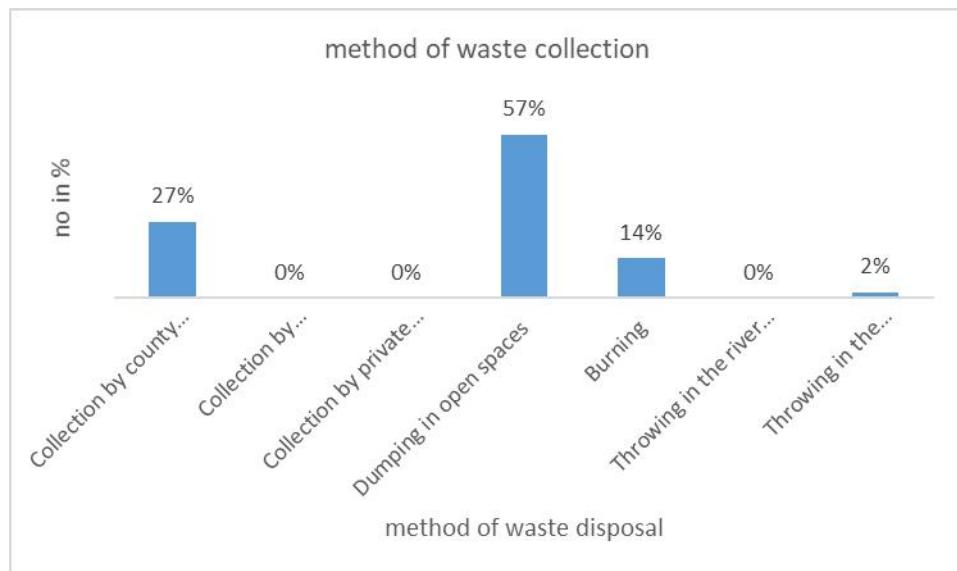


Figure 6- 13: Mode of solid waste disposal

o) Effects of the project on Land use, Cultural heritage areas and Ground water

All (100%) the respondents stated that the project will not affect the land use, cultural centers and ground water.

p) Anticipated positive impacts;

Out of the questionnaires administered, majority (40%) pointed that the Project will lead to improving standards of living and clean environment, thirty percent (30%) of the respondents stated that the Project will improve roads, twenty percent (20%) stated that the Project will improve security and accessibility to clean water, the minority (10%) sated that the Project will improve sanitation and improve the road drainages of Marimanti residents. The distribution of these findings is illustrated in the Figure 6-14.

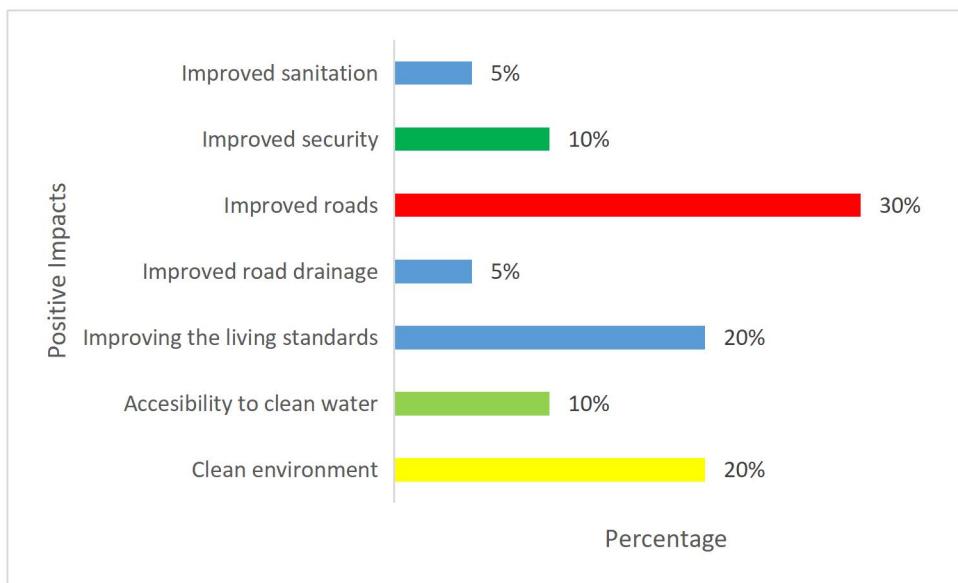


Figure 6- 14: Anticipated project positive impacts

q) Anticipated Negative impacts

Out of the questionnaires administered, forty percent (40%) stated that the Project will not have negative effects, forty percent (40%) pointed that the Project will lead to air pollution and damaging of pipes during construction, twenty percent (20%) of the respondents stated that the Project will lead to destruction of trees and increase in solid waste. The distribution of these findings is illustrated in the Figure 6-15.

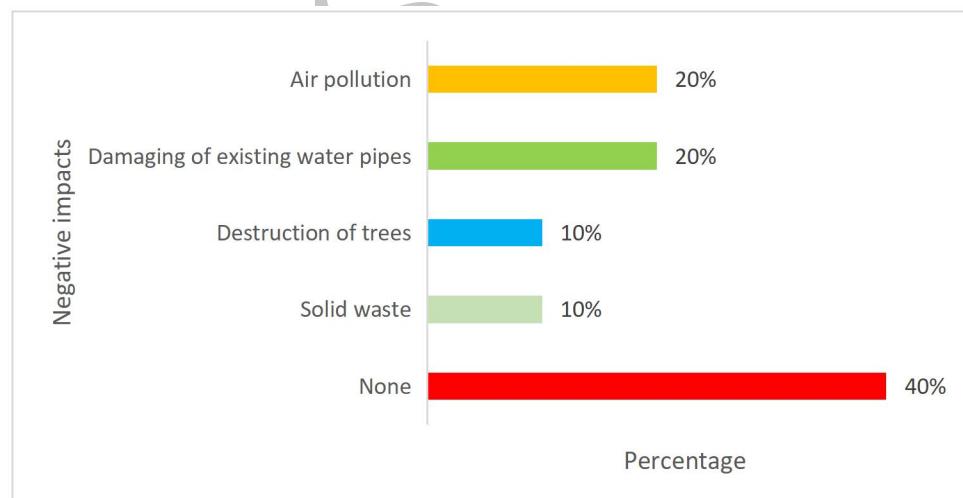


Figure 6- 15: Anticipated Negative impacts

r) Mitigation measures for the negative impacts

For addressing the concerns raised during the, the following mitigation measures can be considered:

Mitigating Solid Waste:

1. Waste management systems: Implement efficient waste management systems, including recycling and proper disposal methods, to reduce the generation of solid waste.
2. Public awareness campaigns: Educate the community about the importance of waste reduction, segregation, and responsible disposal practices.

Mitigating Destruction of Trees:

1. Reforestation efforts: Implement tree planting and reforestation projects to compensate for any trees that are removed, ensuring a net positive impact on the environment.
2. Green infrastructure: Incorporate green spaces and sustainable landscaping practices into urban planning to preserve existing trees and encourage biodiversity.

Mitigating Damaging of Existing Water Pipes:

1. Proper construction practices: Ensure that construction activities adhere to best practices to prevent damage to existing water pipes, with the use of proper equipment and techniques.
2. Regular inspections: Conduct regular inspections of the construction site to identify and address any potential risks to water pipes promptly.

Mitigating Air Pollution:

1. Emission controls: Implement measures to control and reduce emissions from sources such as industrial facilities, vehicles, and construction activities.
2. Green transportation initiatives: Encourage the use of eco-friendly transportation options, such as electric vehicles, to reduce air pollution from exhaust emissions.

These mitigation measures aim to address the specific concerns identified during the meetings and create a more positive and effective environment for the implementation of the Project.

s) Project Support and Awareness

Every respondent acknowledged their awareness of the water and sanitation project and expressed their commitment to supporting the project throughout its implementation phase. The analysis is shown in the Figure 6-16;

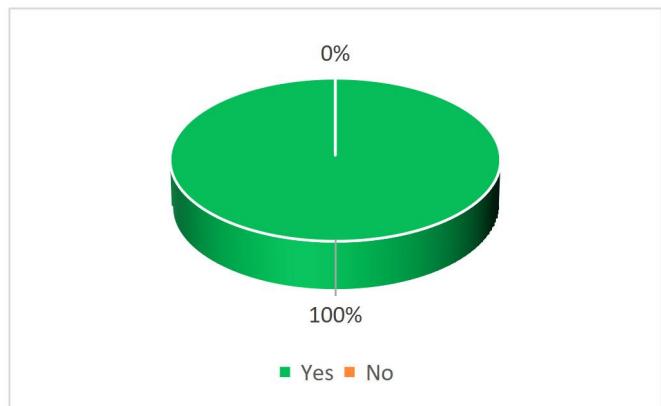


Figure 6- 16: Project support and awareness

t) Recommendations

All the respondents expressed a positive perspective on the Project, emphasizing its positive impact of the Project in Marimanti area.

CHAPTER 7: IMPACTS IDENTIFICATION AND MITIGATION MEASURES

7.1 Introduction

This ESIA assessment has been systematically conducted to determine whether the proposed Project shall have a diverse impact on the environment. The Environmental Management and Co-Ordination Act (EMCA) No 8 of 2015 provide the legal and statutory guideline for the Environment and Social Impact Assessment process in Kenya.

The impacts in this Chapter have been generated based on the analysis of the proposed environment in relation to the proposed project. The impacts have been segregated in three main phases: Pre-Construction Phase, Construction Phase, Operation Phase and Decommissioning Phase. Impacts can be categorized into:

- Impacts on biophysical environment;
- Health and safety impacts; and
- Social-economic impacts

7.2 Definition and Classification of Environment Impact

An environmental impact is any change to the existing condition of the environment caused by human activity or an external influence. Impacts may be:

- Positive (beneficial) or negative (adverse); and
- Direct or indirect, long-term or short-term in duration, and wide-spread or local in the extent of their effect.

Impacts are termed cumulative when they add incrementally to existing impacts. In the case of the project, potential environmental impacts would arise during the construction and the operations phases of the Project and at both stages, positive and negative impacts would occur.

7.2.1 Impact Assessment and Scoring

The impact analysis was done using the Leopold matrix which 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 were done.

Precautionary principle was used to establish the significance of impacts and their management and mitigation i.e., information, the environmentalist erred on the side of caution.

Table 7:1: Impact Rating Criteria for Environment and Social Risks

Extent		Duration		Intensity		Probability		Weighting Factor (WF)		Significance Rating (SR)		Mitigation efficiency		Significance following Mitigation (SFM)	
Foot print	1	Short term	1	Low	1	Probable	1	Low	1	Low	0-19	High	0,2	High	0-19
Site (1 km radius)	2	Short to medium	2			Possible	2	Low to Medium	2	Low to Medium	20-30	Medium to High	0,4	Medium to High	20-30
Location	3	Medium term	3	Medium	3	Likely	3	medium	3	medium	40-59	medium	0,6	medium	40-59
Sub County	4	Long term	4			Highly likely	4	Medium to high	4	Medium to high	60-79	Low to medium	0,8	Low to medium	60-79
County	5	Permanent	5	High	5	High	5	High	5	High	80-100	low	1,0	low	80-100

Definition of Terms

Extent: An area of influence covered by the impact. 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 at location level (3) or could be County (5)

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 five categories according to this time period is zero, up to 1 year (short term), or more than two years, which are called respectively medium term (3), long-term (4), and permanent (5).

Intensity: refers to the degree of impact on the factor, in the specific area in which it operates, ranked from low (1) to high (5).

Probability: Refers to the likelihood of the impact occurring during the project implementation, this is also ranked as Probable (1) to highly probable

7.3 Pre-construction phase Positive Impacts for Roads Project

7.3.1 Documentation and publicity

The project area shall benefit significantly in terms of the intensive information gathering during the pre-project feasibility study and the pre-project ESIA which shall generate useful reports that shall create important reference points for the area both for scientific research and planning activities.

7.3.2 Employment

Employment opportunities shall be created in the construction of camp sites by the Contractor as well as employment of enumerators during data collection before construction works.

7.4 Pre- Construction Negative impacts for Roads Project

7.4.1 Temporary land interference

The proposed project is likely to cause temporary interference with the current state of environment in the area due to the excavation and construction works

Mitigation Measures

- Notify community members.
- Reinstatement to be done after completion of the project.
- Mark project is to avoid conflicts with other activities

7.4.2 Influx of workers from other areas

The project area might experience an influx of construction workers from other areas who shall come to seek for job opportunities.

Mitigation Measures:

- Effective community engagement and strong grievance mechanisms on matters related to labour.

7.5 Construction Phase Positive Impacts for Roads Project

The following are the positive impacts during the construction phase of the proposed project:

7.5.1 Employment opportunities

With the construction of the proposed Project, there shall be employment opportunities for both professionals and unskilled workers, earnings from the wages shall improve their living standards. The workers shall include casual laborers, plumbers and engineers who are expected to work for a period of time. Semi-skilled, unskilled laborers and formal employees are expected to obtain gainful employment during the period of construction. With labour

intensive construction technologies, the project shall provide employment for youths and provide support to the GoK initiatives on creation of jobs.

Employment opportunities shall also be of benefit in economic and social sense. Economic sense means, that abundant unskilled labour shall be used while social sense signify that the poor community shall be engaged in productive employment other than remaining idle and helpless which in most cases may translate to engagement in crime. Apart from casual labour, semi-skilled and skilled employees are also expected to obtain employment during the construction period. Employment opportunities shall also be of benefit in economic and social sense.

7.5.2 Creation of a market for construction materials

The project shall require materials, some of which shall be sourced locally and some internationally. These include plant steel and plastic pipes, valves, cement, sand, hard-core and chemicals. This shall provide a ready market for suppliers in and outside the project area.

7.5.3 Increased local incomes.

The local community may get extra income from the sale of construction materials from their firms and also renting spaces for camp sites.

7.5.4 Economic growth

Through the use of locally available materials during the construction phase for example pipes and others; the project shall contribute towards growth of the country's economy by contributing to the gross domestic product. The consumption of these materials, oil, fuel and others shall attract taxes.

7.5.5 Injection of money into the local economy

A large sum of the project money shall be released into the local economy due to the construction activities. It is envisaged that during construction a large number of activities shall take place including but not limited to the following listed below.

- Payments for skilled and unskilled labour.
- Purchases of construction materials; and
- Payments for local provisions including fuel, foods and accommodation.

7.6 Construction Phase Negative impacts for Roads Construction

7.6.1 Noise and Excessive Vibrations

Noise and Excessive Vibrations are caused by operation of construction plant and equipment

and activities such as excavation and rock breaking. This impact poses a health and safety risk to both the communities living in the project area and construction workers.

Mitigation Measures for exposure to Noise and Excessive Vibrations

- Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009.
- Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity.
- Undertake Noise and Vibration Assessments.
- Effective use of appropriate PPE (ear plugs or muffs) by exposed workers and Proper maintenance of machines.
- Any complaints received by the Contractor regarding noise shall be recorded and communicated to the Supervising Engineer for appropriate action.
- The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas.

7.6.2 Air Pollution and Dust Generation

Air Pollution can be caused by emissions from Construction Plant and Equipment and Vehicles. Dust can be generated by vehicles travelling on unpaved roads and tracks, and dust from exposed, non-vegetated surfaces. Some dust shall also be generated during excavation works, by blowing from dump truck loads.

Mitigation Measures (Air pollution)

- The contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer.
- Workers shall be trained on management of air pollution from vehicles and machinery.
- All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications.
- The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible.

- The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds.
- Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust.
- Water sprays shall be used on all earthwork's areas within 200 meters of human settlement especially during the dry season.

7.6.3 Vegetation Clearing, Soil Erosion and Sedimentation

Construction activities have the potential to clear vegetation and, loosen soils particularly on slopes which can then be washed down into the lower areas (streams and valleys) and soil quality degradation is also likely to occur during construction because of disposal of construction materials on the adjacent lands. It is worth noting that the potential significant impact on flora in the area shall be short term and reversible. No rare, threatened, critically endangered or endemic plant or animal species were observed.

Mitigation Measures

- Reinstatement of the project sites to their original after completion of civil and road works
- All hedges damaged during construction to be reinstated after completion of the Works.
- The contractor to adhere to the delineated construction work area.
- Planting of grass along the way leave and Pipeline friendly tree to be grown after construction.
- Maximum reuse of excavated material.
- Implementation of Soil erosion management in the spoil locations
- Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately.
- Contractor's Camps and Construction Sites to have designated waste collection points,

7.6.4 Solid Wastes Generation from Construction activities

Construction activities at the work sites and Contractor's Camps shall generate some Spoil material, solid wastes such as plastic containers, used tires, metal parts, plastics, and cables. Such material if not mitigated could be washed away to drainage channels and rivers eventually clogging the drainage channels and increasing river sedimentation.

Mitigation measure (Solid Waste Mitigation Measures)

- Maximum reuse of excavated material.
- Implementation of Soil erosion management in the spoil locations
- Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately.
- Contractor's Camps and Construction Sites to have designated waste collection points,
- Contractor shall engage a licensed waster transported to regularly transport accumulated wastes for final disposal at an approved dumping site.
- Environmental Management, Health and Safety Training Programmes to be conducted for Contractor's Staff to create awareness on proper solid wastes management.
- Contractor to provide different bins for segregation of non-hazardous and hazardous wastes for appropriate disposal.
- Tracking of waste to be undertaken to ensure disposal to designated dumping sites.

7.6.5 Impacts on Soils

The Project activities are likely to have minor impacts on soils; these impacts include:

- i. Soil Erosion
- ii. Soil de-stabilization
- iii. Soil pollution.

The impact if not mitigated could result to:

- i. Sediment transfer.
- ii. Reduced rainfall infiltration
- iii. Riverbank damage
- iv. Alteration of the biophysical and chemical component of the soil reducing soil productivity.

Mitigation measures (Soil Erosion)

- The contractor to adhere to the proposed soil conservation practices.
- Proper and compacted back filling.
- The contractor to stick to clear delineation of the construction to avoid vegetation loss.

- Planting of vegetation cover along the pipeline way leave

Mitigation measures (Soil de-stabilization)

- Split compacted area to reduce runoff & re-vegetate where necessary.
- Vehicles to be kept in designated access roads.
- Minimize compaction during stockpiling by placing soil in dry state.

Mitigation measures (Soil Pollution)

- Any polluted soil should be handled with care for proper disposal.
- Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards.
- Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills.
- Excavation materials to be stockpiled at the demarcated location.
- Rehabilitation of the site after construction

7.6.6 Project Impact on Water

The various construction activities may have a negative impact on the existing hydrology via natural drainage patterns. Solid as well as liquid waste if not properly stored or disposed of, may seep into groundwater or find its way into the surface water, thus affecting the water resources.

The project is likely to have less significant impacts to water in terms of:

- Increased Water demand
- Management of Wastewater

This impact if not mitigated could result to

- Reduced water quality
- Siltation
- Increased water demand
- Increased toxic levels in soil and water.

Project Impacts on Water Resources can be mitigated as follows.

Mitigation measures (Reduced Water Quality)

- Storing of fuels, oils, and chemicals on impermeable surfaces away from surface drains

- The machines to be properly serviced offsite and maintained to avoid spillage of oil into the water bodies.

Mitigation measures (Siltation, Obstruction and Water Demand)

- Use of soil erosion control measures e.g., construction of gabions, vegetating the site after laying pipes

Mitigation measure (Wastewater Management)

- Grey water to be contained and properly channeled.
- Onsite treatment of grey water by the facility approved by the resident engineer.
- Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies.
- Prompt action to be taken by the Contractor in case of any pollution incident.
- Ensure prompt reinstatement of drainage channels following trenching and backfilling and providing for temporary drains.

7.6.7 Accidental Oil and fuel Spills and Leaks

The project shall involve use of plant and equipment that shall use diesel oils. In the event that these oils accidentally leak into the environment, they could result to significant contamination of soil, surface and underground water resources.

Oils Spills can be mitigated as follows.

- Checking and regular servicing of Equipment.
- Re-fuelling at safe designated locations.
- Storage areas to be purpose-built with secondary containment.
- Use of spill kits and applications of emergency spill procedures.
- Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer acts as sink to potential oil spills and shall be replaced when saturated.
- Vehicle maintenance is to be done in impervious concrete platforms and grease and oil traps to be used.
- Safe disposal of used oil through licensed hazardous waste handler.

7.6.8 Loss of Temporal Assets and Sources of Livelihood

No Impact is anticipated to people's assets and sources of livelihood due to the following reasons.

- i) No anticipated displacement was identified during social screening studies undertaken during the ESIA.
- ii) Any displacement that may be identified during construction to be dealt with on case-by-case basis

7.6.9 Disruption of Public Utilities

The proposed project shall affect other public utility infrastructure which include, existing water infrastructure, internal roads within the project areas, and storm water drainage channels.

Mitigation Measures for Disruption of Public Utilities

- Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works.
- Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services.
- Consultation and liaison with the various service providers shall be undertaken throughout the project life.

7.6.10 Risk of Accidents at Work Sites

Accidents during construction activities may occur due to failure to use Personal Protective Equipment (PPE) by workers on site and members of the public illegally accessing the work sites, collapsing of pipeline trenches, traffic accidents involving construction vehicles, electrical safety risks. Accidents may result in injuries or even death of workers or members of the public.

Mitigation Measures for Accidents at Work sites

- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer. The plan shall comprehensively analyze all potential safety and health risks and provide corresponding prevention measures, including emergency response plan.
- All workers to be inducted and trained on specific safety measures regularly throughout the construction period.

- As applicable, works including operating equipment and electromechanical installations shall be performed only by duly qualified personnel.
- Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls, and helmets. Use of PPE to be enforced by the Supervising Engineer.
- Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles. Trained first aiders to be available on site at any time works are ongoing. The ratio of first aiders to workers on site shall be in line with the OSHA First Aid Rules
- Isolate the site for access by the local communities during the construction for their safety and health. Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public.
- Strict use of warning signage's and tapes where the trenches are open and at other active construction sites.
- Contractor to Employ and train Road Safety Marshalls who shall be responsible for management of traffic on site.
- Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer
- Contractor to have designated personnel among the employees to oversee implementation of safety measures at the work sites.
- Contractor's trenching method statement shall specifically incorporate measures that ensure trenching and pipe laying is safely conducted.
- Limit lengths of open trenches to what can be backfilled within a shortest period feasible
- Contractor shall ensure all open trenches are kept drained.
- Provide and maintain serviceable and appropriate firefighting equipment at the work sites, including fuel storage areas, garages, and offices. Workers shall also be drilled on emergency fire response in line with the OSHA 2007 requirements.
- Maintain incident register and undertake investigations on any major incidents and accidents to inform further preventive actions as necessary.

7.6.11 Traffic Congestion and Inconveniences

Traffic congestion is anticipated from site-related traffic from Contractor vehicles. This may interfere with socio-economic activities which majorly rely on the transport network affected

by the construction activities. The proposed project would have minor, short-term impacts on transportation, as the pipelines are anticipated to be installed within the road reserve.

Mitigation Measures for traffic congestion

- The contractor shall develop a traffic management plan.
- The Contractor will provide temporary legible and reflective road signs or notices to indicate ongoing works and deviation routes to guide motorists. The Contractor together with the Resident Engineer Should Plan itineraries for site traffic daily and avoid peak traffic periods.
- The Contractor will provide traffic controllers/marshals at active construction sites to manage and control the traffic.
- The Resident Engineer and Contractor shall choose traffic routes to reduce the impact in the neighbourhood avoiding, as far as practical any sensitive areas.
- The Contractor should affect traffic controls and cleanliness to avoid congestion and truck accidents on roads.
- For the site traffic the Contractor must ensure that they
 - ✓ Only Park in designated parking areas.
 - ✓ Don't block pedestrian routes.
 - ✓ Don't block traffic routes.
 - ✓ Obey the speed limit.
 - ✓ The resident Engineer must ensure that the Contractor:
 - Introduces segregated pedestrian walkways.
 - Introduces speed limits.
 - Reduces the need for reversing vehicles, by introducing a one-way system.
 - Uses a qualified Banks man to control deliveries and reversing vehicles.
 - Designates loading/unloading areas.
- The resident Engineer is to ensure that the Contractor:
 - ✓ Introduces segregated pedestrian walkways.
 - ✓ Introduces and enforces speed limits particularly in the residential areas.
 - ✓ Reduces the need for reversing vehicles, by introducing a one-way system.

- ✓ Uses a qualified banks man to control deliveries and reversing vehicles.
- ✓ Designates loading/unloading areas.
- Provision of a road safety analysis and campaign, including discussing with the local community on provision of road suitable crossing facilities for domestic animals, children, etc.
- Drivers and equipment operators drive safe within the project area and sign Code of Conduct

7.6.12 Labour influx and Sexual Offences to Minors

The project at construction phase has the potential of attracting workers from various regions to Marimanti informal settlement and their surrounding environs. If the construction tender is awarded to an international contractor, chances of foreign worker's influx to the project area are high. Labour influx has potential of triggering the following impacts.

- i. Increased HIV/AIDS
- ii. Early pregnancies
- iii. School dropout
- iv. Sexual offences
- v. Gender based violence.

Mitigation measures (Labour Influx)

- Effective community engagement and strong grievance mechanisms on matters related to labour.
- Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx.
- Proper records of labour force on site while avoiding child and forced labour.
- Fair treatment, non-discrimination, and equal opportunity of workers.
- Comply to provisions of WIBA 2007 and IFC PS 2 on labour and Working Conditions, and ILO Conventions 87, 98, 29, 105, 138, 182, 100, 111
- Develop and implement a children Protection Strategy

7.6.13 Increased Transmission of HIV/AIDS

The project shall attract new people to the project area seeking employment during the construction period and this can lead to increased transmission of HIV/AIDS and or the other sexually transmitted diseases (STDs). This may result from increased incomes of workers whereby some may try to seek for sexual favors using their incomes. The fact that some the contractors and workers shall be away from their homes may lead them seeking sexual satisfaction from the area residents.

Mitigation Measures for Increased HIV transmission

- Offer HIV/AIDS sensitization to workers in collaboration with the local health facilities.
- Offer VCT services to the community members with the help of the local Health facilities.
- Contractor to provide standard quality condoms to personnel on site.

7.6.14 Human Rights Principles and Gender Inclusivity

The possibility of the works Contractor not adhering to requirements of Human Rights Principles and Gender Inclusivity could trigger resistance from Civil Society Organization (CSO) through demonstrations. This could lead to delay substantial delay in Project implementation.

Mitigation measures to non-adherence to Human Rights Principles and Gender inclusivity

- Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule.
- Comply to provisions of guidelines on incorporating Human Rights Standards and Principles, including Gender,
- Protecting human risk areas associated with, Disadvantaged Groups, interfering with Participation Rights, and interfering with Labour Rights

7.6.15 Increased Crime and Insecurity

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

Mitigation Measures for increased Crime and Insecurity

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

7.6.16 Gender Based Violence.

GBV constitutes acts of gross misconduct and are therefore grounds for sanctions, penalties and/or termination of employment. All forms of GBV including grooming are unacceptable be it on the work site, the work site surroundings, or at workers' camps. Prosecution of those who commit to be pursued.

This impact is triggered during Project Construction Phase is likely to occur. Therefore, below listed provisions are provided to mitigate against such GBV and SH related Project induced impacts.

Mitigation measures for GBV

- The Contractor shall mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule.
- The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women, youth and people with disability and VMGs.
- Protecting Human Risk Areas Associated with, Disadvantaged Groups, interfering with Participation Rights and interfering with Labour Rights:
- Treat women and children (persons under the age of 18) with respect regardless of race, color, language, religion, political or other opinion, national, ethnic, or social origin, property, disability, birth or other status.
- Do not use language or behavior towards women or children that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
- Sexual activity with children under 18—including through digital media is prohibited. Mistaken belief regarding the age of a child and consent from the child is not a defense.
- Exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior is prohibited.
- Sexual interactions between contractor's and consultant's employees at any level and member of the communities surrounding the workplaces that are not agreed to with full consent by all parties involved in the sexual act are prohibited. This includes relationships involving the withholding, promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex – such sexual activity is considered "non-consensual" within the scope of this Code.

- Where an employee develops concerns or suspicions regarding acts of GBV by a fellow worker, whether in the same contracting firm or not, he or she must report such concerns in accordance with Standard Reporting Procedures.
- All employees are required to attend an induction-training course prior to commencing work on site to ensure they are familiar with the GBV Code of Conduct.
- All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the institutional GBV Code of Conduct.

7.6.17 Sexual Exploitation and Abuse (SEA)

This impact refers to sexual exploitation and abuse committed by project staff against communities and represents a risk at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project. Sexual exploitation can also be among workers and project staff against workers.

Mitigation Measures

- Develop and implement a SEA action plan with an accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).
- The SEA action plan shall include how the project shall ensure necessary steps are in place for:
 - Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials.
 - Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management.
 - Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of Sexual Exploitation and Abuse (SEA) awareness-raising in all community engagement activities; community-level IEC materials; regular

community outreach to women and girls about social risks and their SEA-related rights.

Management and Coordination: including integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers

7.6.18 Child Labour and Protection

The possibility of contractor children abuse is through hiring of child labour, also labour force on site might abuse children within the Project area through sexual advance that could lead to early pregnancies and school dropout including exposure to communicable diseases such as HIV and AIDS. The contractor shall undertake the below listed mitigation measures.

Mitigation Measures

- The contractor shall develop and implement a Children Protection Strategy that shall ensures minors are protected against negative impacts associated by the Project including SEA.
- All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior.
- Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014
- Wherever possible, ensure that another adult is present when working in the proximity of children.
- Not invite unaccompanied children to worker's home unless they are at immediate risk of injury or in physical danger.
- Refrain from physical punishment or discipline of children.
- Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.

Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation.

7.6.19 Conflicts between Contractor and Community

During construction there is a possibility of conflict arising between the community and contractor with regard to;

- Disruption of the day to day activities of the community;
- Nuisance caused by air/dust and noise pollution;
- Impacts of water pollution and disruption of piped water supply;
- Over exploitation of local material sites by the contractor;
- Immoral social/sexual relations between the contractor's workers and local population;
- Destruction of crops and property along the road reserve;
- Allocation of employment opportunities;
- Issue of access culverts to homesteads.

Mitigation Measures

- Establishment of a formal grievance and redress mechanism by the supervising consultant/Engineer;
- The Contractor shall be required to minimize the possibility of occurrence of grievances with the local community;
- The contractor shall maintain a Complaints Register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken.
- Copies of received complaints shall be copied to the supervising consultant/Engineer and issues to be addressed accordingly.

7.6.20 Project Intervention Priority Conflicts

This risk may arise from the exclusions of some beneficiaries due to unfriendly designs and lack of implementation of projects prioritized by the community

Mitigation Measure

- Continuous community engagement and participation
- Establishment of a formal grievance and redress mechanism
- Maintaining a complaints register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken.

7.7 Operation phases Positive Impacts for Roads Construction

7.7.1 Creation of employment

During operational phase, there shall be employment opportunities especially for those who shall be employed to manage bitumen road. This shall improve their living standards.

7.7.2 Improved transport and economy of the people

The road will facilitate easy transportation within the project area as well as increasing communication among the communities within the settlement. The improved road would be particularly beneficial to passengers and cargoes as transportation time will be shortened. Operation vehicles costs are very high such as high fuel consumption and frequent need to replace parts due to the condition of the road. It is anticipated with the improved status of the road transport costs shall be lowered.

7.7.3 Creation of Wealth

The proposed project shall ultimately provide revenues to the beneficiaries and expand the wealth base for the nation. It shall pump both liquefied and tied up wealth hence making the nation gain. It shall also go a long way in uplifting Tharaka Nithi County and its neighbourhood as a whole. Once the people shall be empowered in the project area, some shall invest and develop the nearby towns.

7.7.4 Improved revenue for County Government

Improved revenue to County Government due to the improved transport sector. The county will collect revenue from the transport operators seeking licenses and that will be used in the management and maintenance of the road infrastructure.

7.8 Operation Phase Negative Impacts for Roads Project

7.8.1 Risk of Encroachment and Construction of Structures on the Road Reserve

Encroachment and construction of structures on road reserve is common in many areas across the county

Mitigation measures

- Arrest and prosecution of encroachers as required by Tharaka Nithi County Bylaws on Way Leaves and Road Reserves.

7.8.2 Visual and landscape impact management

Once the temporary working areas have been reinstated, much of the landscape will return to its former condition. The only persistent visual impacts will take the form of, water tanks, and chambers. This will have minor visual impacts during its operational life.

Mitigation measures

- Elaborate landscaping and maintenance of these sites can limit the viewpoints to the facilities and thus reduce their visual impact.

7.8.3 Pollution of water and soils

Pollution of water and soil due to drainage blockages which can lead to run offs with contaminants which will eventually be deposited in the soils and water.

Mitigation

- Blockages should be detected and promptly replaced;
- County Government to attend to blocked drainages promptly to prevent excessive loss of soil through erosion;
- Provide high risk areas with appropriate drainage for effective channeling of burst sewage spills;

7.8.4 Health and Safety Risks

Poorly maintained and designed ablution block can lead to dispersal of raw sewage particularly at pit into the environment. These can cause outbreaks of water borne related diseases like cholera and typhoid from contamination of water sources by raw sewage.

Mitigation measures

- Regular check, repair and maintenance of the water pipeline and sewer lines by NIWASCO officials.
- Activate a community watch group for information sharing on the status of the water line and sewer lines.
- Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas)
- Awareness rising among community members not to dump solids in manholes.
- Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations.
- Carry continuous Public Health Awareness

7.9 Decommissioning Phase Positive impact for Road Project

7.9.1 Employment opportunities

Temporary employment opportunities shall be created for the demolition of laid and constructed structures during the decommissioning works.

7.9.2 Environmental rehabilitation

Rehabilitation of site to ensure the site is left as natural as possible close or better than before.

7.10 Decommissioning Phase Negative Impacts for Road Project

7.10.1 Noise Pollution

Activities likely to produce noise during decommissioning include demolition of structures and excavation of pipeline works and structures at the intake areas as well as any staff offices and quarters built on site.

Mitigation measures:

- Schedule noisy activities during the daytime period;
- Use silencers on machines where possible.
- Ensure machinery is well maintained to reduce noise emitted.

7.10.2 Solid Waste Material

It is expected that large amounts of solid waste material arising during decommissioning shall include glass panels, stones, pipes, wood, metal, paper, plastic, equipment, vegetation, etc. The proper disposal of these materials is critical. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment.

Mitigation measures:

- Disposal of solid waste in compliance with EMCA 2006 Waste Management Regulations.
- Segregation of waste to encourage reuse and recycling.
- Ensuring that the contracted waste collector is registered with NEMA to collect and dispose wastes.

7.10.3 Occupational health and safety

If not handled with care the demolition may lead to exposure of hazardous chemicals to workers and surrounding communities which poses as health risks to them. Machinery and

equipment used for the same also possess as danger to the workers if not handled well and with the correct PPE.

Mitigation measures:

- Provide the correct PPE for the workers when conducting the demolition activities.
- Conduct training on health and safety procedures to the workers prior to commencement of demolition.
- Proper plans should be made prior to demolition so as to contain the raw sewage and other wastewater that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it.

7.11 Pre-construction phase Positive Impacts for Water Project**7.11.1 Documentation and publicity**

The project area shall benefit significantly in terms of the intensive information gathering during the pre-project feasibility study and the pre-project ESIA which shall generate useful reports that shall create important reference points for the area both for scientific research and planning activities.

7.11.2 Employment

Employment opportunities shall be created in the construction of camp sites by the Contractor as well as employment of enumerators during data collection before construction works.

7.12 Pre- Construction Negative impacts for Water Project**7.12.1 Temporary land interference**

The proposed project is likely to cause temporary interference with the current state of environment in the area due to the excavation and construction works.

Mitigation Measures

- Notify community members.
- Reinstatement to be done after completion of the project.
- Mark project is to avoid conflicts with other activities

7.12.2 Influx of workers from other areas

The project area might experience an influx of construction workers from other areas who shall come to seek for job opportunities.

Mitigation Measures:

- Effective community engagement and strong grievance mechanisms on matters related to labour.

7.13 Construction Phase Positive Impacts for Water Project

The following are the positive impacts during the construction phase of the proposed project:

7.13.1 Employment opportunities

With the construction of the proposed Project, there shall be employment opportunities for both professionals and unskilled workers, earnings from the wages shall improve their living standards. The workers shall include casual laborers, plumbers and engineers who are expected to work for a period of time. Semi-skilled, unskilled laborers and formal employees are expected to obtain gainful employment during the period of construction. With labour intensive construction technologies, the project shall provide employment for youths and provide support to the GoK initiatives on creation of jobs.

Employment opportunities shall also be of benefit in economic and social sense. Economic sense means, that abundant unskilled labour shall be used while social sense signify that the poor community shall be engaged in productive employment other than remaining idle and helpless which in most cases may translate to engagement in crime. Apart from casual labour, semi-skilled and skilled employees are also expected to obtain employment during the construction period. Employment opportunities shall also be of benefit in economic and social sense.

7.13.2 Creation of a market for construction materials

The project shall require materials, some of which shall be sourced locally and some internationally. These include plant steel and plastic pipes, valves, cement, sand, hard-core and chemicals. This shall provide a ready market for suppliers in and outside the project area.

7.13.3 Increased local incomes.

The local community may get extra income from the sale of construction materials from their firms and also renting spaces for camp sites.

7.13.4 Economic growth

Through the use of locally available materials during the construction phase for example pipes and others; the project shall contribute towards growth of the country's economy by contributing to the gross domestic product. The consumption of these materials, oil, fuel and others shall attract taxes.

7.13.5 Injection of money into the local economy

A large sum of the project money shall be released into the local economy due to the construction activities. It is envisaged that during construction a large number of activities shall take place including but not limited to the following listed below.

- Payments for skilled and unskilled labour.
- Purchases of construction materials; and
- Payments for local provisions including fuel, foods and accommodation.

7.14 Construction Phase Negative impacts for Water Project

7.14.1 Noise and Excessive Vibrations

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

Mitigation Measures for exposure to Noise and Excessive Vibrations

- Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009.
- Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity.
- Undertake Noise and Vibration Assessments.
- Effective use of appropriate PPE (ear plugs or muffs) by exposed workers and Proper maintenance of machines.
- Any complaints received by the Contractor regarding noise shall be recorded and communicated to the Supervising Engineer for appropriate action.
- The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas.

7.14.2 Air Pollution and Dust Generation

Air Pollution can be caused by emissions from Construction Plant and Equipment and Vehicles. Dust can be generated by vehicles travelling on unpaved roads and tracks, and dust from

exposed, non-vegetated surfaces. Some dust shall also be generated during excavation works, by blowing from dump truck loads.

Mitigation Measures (Air pollution)

- The contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer.
- Workers shall be trained on management of air pollution from vehicles and machinery.
- All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications.
- The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible.
- The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds.
- Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust.
- Water sprays shall be used on all earthwork's areas within 200 meters of human settlement especially during the dry season.

7.14.3 Vegetation Clearing, Soil Erosion and Sedimentation

Construction activities have the potential to clear vegetation and, loosen soils particularly on slopes which can then be washed down into the lower areas (streams and valleys) and soil quality degradation is also likely to occur during construction because of disposal of construction materials on the adjacent lands. It is worth noting that the potential significant impact on flora in the area shall be short term and reversible. No rare, threatened, critically endangered or endemic plant or animal species were observed.

Mitigation Measures

- Reinstatement of the project sites to their original after completion of civil and road works
- All hedges damaged during construction to be reinstated after completion of the Works.
- The contractor to adhere to the delineated construction work area.
- Planting of grass along the way leave and Pipeline friendly tree to be grown after construction.

- Maximum reuse of excavated material.
- Implementation of Soil erosion management in the spoil locations
- Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately.
- Contractor's Camps and Construction Sites to have designated waste collection points,

7.14.4 Solid Wastes Generation from Construction activities

Construction activities at the work sites and Contractor's Camps shall generate some Spoil material, solid wastes such as plastic containers, used tires, metal parts, plastics, and cables. Such material if not mitigated could be washed away to drainage channels and rivers eventually clogging the drainage channels and increasing river sedimentation.

Mitigation measure (Solid Waste Mitigation Measures)

- Maximum reuse of excavated material.
- Implementation of Soil erosion management in the spoil locations
- Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately.
- Contractor's Camps and Construction Sites to have designated waste collection points,
- Contractor shall engage a licensed waster transported to regularly transport accumulated wastes for final disposal at an approved dumping site.
- Environmental Management, Health and Safety Training Programmes to be conducted for Contractor's Staff to create awareness on proper solid wastes management.
- Contractor to provide different bins for segregation of non-hazardous and hazardous wastes for appropriate disposal.
- Tracking of waste to be undertaken to ensure disposal to designated dumping sites.

7.14.5 Impacts on Soils

The Project activities are likely to have minor impacts on soils; these impacts include:

- i. Soil Erosion
- ii. Soil de-stabilization
- iii. Soil pollution.

The impact if not mitigated could result to:

- i. Sediment transfer.
- ii. Reduced rainfall infiltration
- iii. Riverbank damage
- iv. Alteration of the biophysical and chemical component of the soil reducing soil productivity.

Mitigation measures (Soil Erosion)

- The contractor to adhere to the proposed soil conservation practices.
- Proper and compacted back filling.
- The contractor to stick to clear delineation of the construction to avoid vegetation loss.
- Planting of vegetation cover along the pipeline way leave

Mitigation measures (Soil de-stabilization)

- Split compacted area to reduce runoff & re-vegetate where necessary.
- Vehicles to be kept in designated access roads.
- Minimize compaction during stockpiling by placing soil in dry state.

Mitigation measures (Soil Pollution)

- Any polluted soil should be handled with care for proper disposal.
- Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards.
- Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills.
- Excavation materials to be stockpiled at the demarcated location.
- Rehabilitation of the site after construction

7.14.6 Project Impact on Water

The various construction activities may have a negative impact on the existing hydrology via natural drainage patterns. Solid as well as liquid waste if not properly stored or disposed of, may seep into groundwater or find its way into the surface water, thus affecting the water resources.

The project is likely to have less significant impacts to water in terms of:

- i. Increased Water demand
- ii. Management of Wastewater

This impact if not mitigated could result to

- i. Reduced water quality
- ii. Siltation
- iii. Increased water demand
- iv. Increased toxic levels in soil and water.

Project Impacts on Water Resources can be mitigated as follows.

Mitigation measures (Reduced Water Quality)

- Storing of fuels, oils, and chemicals on impermeable surfaces away from surface drains
- The machines to be properly serviced offsite and maintained to avoid spillage of oil into the water bodies.

Mitigation measures (Siltation, Obstruction and Water Demand)

- Use of soil erosion control measures e.g., construction of gabions, vegetating the site after laying pipes

Mitigation measure (Wastewater Management)

- Grey water to be contained and properly channeled.
- Onsite treatment of grey water by the facility approved by the resident engineer.
- Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies.
- Prompt action to be taken by the Contractor in case of any pollution incident.
- Ensure prompt reinstatement of drainage channels following trenching and backfilling and providing for temporary drains.

7.14.7 Accidental Oil and fuel Spills and Leaks

The project shall involve use of plant and equipment that shall use diesel oils. In the event that these oils accidentally leak into the environment, they could result to significant contamination of soil, surface and underground water resources.

Oils Spills can be mitigated as follows.

- Checking and regular servicing of Equipment.
- Re-fuelling at safe designated locations.
- Storage areas to be purpose-built with secondary containment.
- Use of spill kits and applications of emergency spill procedures.
- Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer acts as sink to potential oil spills and shall be replaced when saturated.
- Vehicle maintenance is to be done in impervious concrete platforms and grease and oil traps to be used.
- Safe disposal of used oil through licensed hazardous waste handler.

7.14.8 Loss of Temporal Assets and Sources of Livelihood

No Impact is anticipated to people's assets and sources of livelihood due to the following reasons.

- i) No anticipated displacement was identified during social screening studies undertaken during the ESIA.
- ii) Any displacement that may be identified during construction to be dealt with on case-by-case basis

7.14.9 Disruption of Public Utilities

The proposed project shall affect other public utility infrastructure which include, existing water infrastructure, internal roads within the project areas, and storm water drainage channels.

Mitigation Measures for Disruption of Public Utilities

- Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works.
- Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services.
- Consultation and liaison with the various service providers shall be undertaken throughout the project life.

7.14.10 Risk of Accidents at Work Sites

Accidents during construction activities may occur due to failure to use Personal Protective Equipment (PPE) by workers on site and members of the public illegally accessing the work sites, collapsing of pipeline trenches, traffic accidents involving construction vehicles, electrical safety risks. Accidents may result in injuries or even death of workers or members of the public.

Mitigation Measures for Accidents at Work sites

- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer. The plan shall comprehensively analyze all potential safety and health risks and provide corresponding prevention measures, including emergency response plan.
- All workers to be inducted and trained on specific safety measures regularly throughout the construction period.
- As applicable, works including operating equipment and electromechanical installations shall be performed only by duly qualified personnel.
- Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls, and helmets. Use of PPE to be enforced by the Supervising Engineer.
- Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles. Trained first aiders to be available on site at any time works are ongoing. The ratio of first aiders to workers on site shall be in line with the OSHA First Aid Rules
- Isolate the site for access by the local communities during the construction for their safety and health. Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public.
- Strict use of warning signage's and tapes where the trenches are open and at other active construction sites.
- Contractor to Employ and train Road Safety Marshalls who shall be responsible for management of traffic on site.
- Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer
- Contractor to have designated personnel among the employees to oversee implementation of safety measures at the work sites.

- Contractor's trenching method statement shall specifically incorporate measures that ensure trenching and pipe laying is safely conducted.
- Limit lengths of open trenches to what can be backfilled within a shortest period feasible
- Contractor shall ensure all open trenches are kept drained.
- Provide and maintain serviceable and appropriate firefighting equipment at the work sites, including fuel storage areas, garages, and offices. Workers shall also be drilled on emergency fire response in line with the OSHA 2007 requirements.
- Maintain incident register and undertake investigations on any major incidents and accidents to inform further preventive actions as necessary.

7.14.11 Traffic Congestion and Inconveniences

Traffic congestion is anticipated from site-related traffic from Contractor vehicles. This may interfere with socio-economic activities which majorly rely on the transport network affected by the construction activities. The proposed project would have minor, short-term impacts on transportation, as the pipelines are anticipated to be installed within the road reserve.

Mitigation Measures for traffic congestion

- The contractor shall develop a traffic management plan.
- The Contractor will provide temporary legible and reflective road signs or notices to indicate ongoing works and deviation routes to guide motorists. The Contractor together with the Resident Engineer Should Plan itineraries for site traffic daily and avoid peak traffic periods.
- The Contractor will provide traffic controllers/marshals at active construction sites to manage and control the traffic.
- The Resident Engineer and Contractor shall choose traffic routes to reduce the impact in the neighbourhood avoiding, as far as practical any sensitive areas.
- The Contractor should affect traffic controls and cleanliness to avoid congestion and truck accidents on roads.
- For the site traffic the Contractor must ensure that they
 - ✓ Only Park in designated parking areas.
 - ✓ Don't block pedestrian routes.
 - ✓ Don't block traffic routes.
 - ✓ Obey the speed limit.

- ✓ The resident Engineer must ensure that the Contractor:
 - Introduces segregated pedestrian walkways.
 - Introduces speed limits.
 - Reduces the need for reversing vehicles, by introducing a one-way system.
 - Uses a qualified Banks man to control deliveries and reversing vehicles.
 - Designates loading/unloading areas.
- The resident Engineer is to ensure that the Contractor:
 - ✓ Introduces segregated pedestrian walkways.
 - ✓ Introduces and enforces speed limits particularly in the residential areas.
 - ✓ Reduces the need for reversing vehicles, by introducing a one-way system.
 - ✓ Uses a qualified banks man to control deliveries and reversing vehicles.
 - ✓ Designates loading/unloading areas.
- Provision of a road safety analysis and campaign, including discussing with the local community on provision of road suitable crossing facilities for domestic animals, children, etc.
- Drivers and equipment operators drive safe within the project area and sign Code of Conduct

7.14.12 Labour influx and Sexual Offences to Minors

The project at construction phase has the potential of attracting workers from various regions to Marimanti informal settlement and their surrounding environs. If the construction tender is awarded to an international contractor, chances of foreign worker's influx to the project area are high. Labour influx has potential of triggering the following impacts.

- i. Increased HIV/AIDS
- ii. Early pregnancies
- iii. School dropout
- iv. Sexual offences
- v. Gender based violence.

Mitigation measures (Labour Influx)

- Effective community engagement and strong grievance mechanisms on matters related to labour.
- Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx.
- Proper records of labour force on site while avoiding child and forced labour.
- Fair treatment, non-discrimination, and equal opportunity of workers.
- Comply to provisions of WIBA 2007 and IFC PS 2 on labour and Working Conditions, and ILO Conventions 87, 98, 29, 105, 138, 182, 100, 111
- Develop and implement a children Protection Strategy

7.14.13 Increased Transmission of HIV/AIDS

The project shall attract new people to the project area seeking employment during the construction period and this can lead to increased transmission of HIV/AIDS and or the other sexually transmitted diseases (STDs). This may result from increased incomes of workers whereby some may try to seek for sexual favors using their incomes. The fact that some the contractors and workers shall be away from their homes may lead them seeking sexual satisfaction from the area residents.

Mitigation Measures for Increased HIV transmission

- Offer HIV/AIDS sensitization to workers in collaboration with the local health facilities.
- Offer VCT services to the community members with the help of the local Health facilities.
- Contractor to provide standard quality condoms to personnel on site.

7.14.14 Human Rights Principles and Gender Inclusivity

The possibility of the works Contractor not adhering to requirements of Human Rights Principles and Gender Inclusivity could trigger resistance from Civil Society Organization (CSO) through demonstrations. This could lead to delay substantial delay in Project implementation.

Mitigation measures to non-adherence to Human Rights Principles and Gender inclusivity

- Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule.
- Comply to provisions of guidelines on incorporating Human Rights Standards and Principles, including Gender,

- Protecting human risk areas associated with, Disadvantaged Groups, interfering with Participation Rights, and interfering with Labour Rights

7.14.15 Increased Crime and Insecurity

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

Mitigation Measures for increased Crime and Insecurity

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

7.14.16 Gender Based Violence.

GBV constitutes acts of gross misconduct and are therefore grounds for sanctions, penalties and/or termination of employment. All forms of GBV including grooming are unacceptable be it on the work site, the work site surroundings, or at workers' camps. Prosecution of those who commit to be pursued.

This impact is triggered during Project Construction Phase is likely to occur. Therefore, below listed provisions are provided to mitigate against such GBV and SH related Project induced impacts.

Mitigation measures for GBV

- The Contractor shall mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule.
- The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women, youth and people with disability and VMGs.
- Protecting Human Risk Areas Associated with, Disadvantaged Groups, interfering with Participation Rights and interfering with Labour Rights:
 - Treat women and children (persons under the age of 18) with respect regardless of race, color, language, religion, political or other opinion, national, ethnic, or social origin, property, disability, birth or other status.
 - Do not use language or behavior towards women or children that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.

- Sexual activity with children under 18—including through digital media is prohibited. Mistaken belief regarding the age of a child and consent from the child is not a defense.
- Exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior is prohibited.
- Sexual interactions between contractor's and consultant's employees at any level and member of the communities surrounding the workplaces that are not agreed to with full consent by all parties involved in the sexual act are prohibited. This includes relationships involving the withholding, promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex – such sexual activity is considered "non-consensual" within the scope of this Code.
- Where an employee develops concerns or suspicions regarding acts of GBV by a fellow worker, whether in the same contracting firm or not, he or she must report such concerns in accordance with Standard Reporting Procedures.
- All employees are required to attend an induction-training course prior to commencing work on site to ensure they are familiar with the GBV Code of Conduct.
- All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the institutional GBV Code of Conduct.

7.14.17 Sexual Exploitation and Abuse (SEA)

This impact refers to sexual exploitation and abuse committed by project staff against communities and represents a risk at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project. Sexual exploitation can also be among workers and project staff against workers.

Mitigation Measures

- Develop and implement a SEA action plan with an accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).
- The SEA action plan shall include how the project shall ensure necessary steps are in place for:

- Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials.
- Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management.
- Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of Sexual Exploitation and Abuse (SEA) awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their SEA-related rights.

Management and Coordination: including integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers

7.14.18 Child Labour and Protection

The possibility of contractor children abuse is through hiring of child labour, also labour force on site might abuse children within the Project area through sexual advance that could lead to early pregnancies and school dropout including exposure to communicable diseases such as HIV and AIDS. The contractor shall undertake the below listed mitigation measures.

Mitigation Measures

- The contractor shall develop and implement a Children Protection Strategy that shall ensure minors are protected against negative impacts associated by the Project including SEA.
- All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior.
- Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014

- Wherever possible, ensure that another adult is present when working in the proximity of children.
- Not invite unaccompanied children to worker's home unless they are at immediate risk of injury or in physical danger.
- Refrain from physical punishment or discipline of children.
- Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.

Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation.

7.14.19 Conflicts between Contractor and Community

During construction there is a possibility of conflict arising between the community and contractor with regard to;

- Disruption of the day to day activities of the community;
- Nuisance caused by air/dust and noise pollution;
- Impacts of water pollution and disruption of piped water supply;
- Over exploitation of local material sites by the contractor;
- Immoral social/sexual relations between the contractor's workers and local population;
- Destruction of crops and property along the road reserve;
- Allocation of employment opportunities;
- Issue of access culverts to homesteads.

Mitigation Measures

- Establishment of a formal grievance and redress mechanism by the supervising consultant/Engineer;
- The Contractor shall be required to minimize the possibility of occurrence of grievances with the local community;
- The contractor shall maintain a Complaints Register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken.
- Copies of received complaints shall be copied to the supervising consultant/Engineer and issues to be addressed accordingly.

7.14.20 Project Intervention Priority Conflicts

This risk may arise from the exclusions of some beneficiaries due to unfriendly designs and lack of implementation of projects prioritized by the community

Mitigation Measure

- Continuous community engagement and participation
- Establishment of a formal grievance and redress mechanism
- Maintaining a complaints register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken.

7.15 Operation phases Positive Impacts for Water Project

7.15.1 Creation of employment

During operational phase, there shall be employment opportunities especially for those who shall be employed to manage, maintain the water lines and elevated water tank. This shall improve their living standards.

7.15.2 Creation of Wealth

The proposed project shall ultimately provide revenues to the beneficiaries and expand the wealth base for the nation. It shall pump both liquefied and tied up wealth hence making the nation gain. It shall also go a long way in uplifting Tharaka Nithi County and its neighbourhood as a whole. Once the people shall be empowered in the project area, some shall invest and develop the nearby towns.

7.15.3 Improved Well-being of Women and Children

At the household level, women and children bear the burden of fetching water. Other than the time spent in getting water from long distances, these practices has far reaching consequences on their health and wellbeing. Time saved thus would be invested in other engagements that could bring financial benefits to the family. Children also bear the brunt of water borne diseases while women are tied down to provide nursing care to the sick family members. With proximity of water all these negative impacts shall be reversed in the project area.

7.15.4 Improved Accessibility to Clean and Reliable Water Supply

The proposed project is intended to improve the water supply to area residents of Marimanti informal settlement.

7.15.5 Improved revenue for NIWASCO

Improved revenue to Nithi Water and Sanitation Company from increased customer base as the proposed project shall increase the number of residents being served by the water companies. It shall also make the supply reliable thus increasing the revenue base. Further, this shall improve sustainability of the company.

7.15.6 Reduced exposure to health risks and improved nutrition

Improved water and sanitation services will lead to reduced cases of water borne diseases associated with pollution of water resources and drinking water, this will also cause improved water, Health, and Sanitation status.

7.16 Operation Phase Negative Impacts for Water Project

7.16.1 Risk of illegal connection and Vandalism of the Pipeline

Illegal connections and vandalism of Water Pipelines is a common practice; this ultimately results in loss of revenue to Nithi Water and Sanitation Company.

Mitigation measures

- This shall require constant inspection by the Nithi Water and Sanitation Company officials and installation of leak and burst detectors at designated areas along the pipeline and;
- Conduct public sensitization programs on importance not interfering with the water pipeline and the need to seek official water connection from NIWASCO.

7.16.2 Increased domestic wastewater generation.

The proposed project shall result in increased wastewater generation through the introduction of more water in the system. This may lead pollution of the environment. Sections of the project area are not served by the sewerage system and the residents rely on pit latrines and septic tanks for sewer disposal and grey water through surface drain to farmland.

Mitigation measures

- The client to consider construction of a sewerage system in the project areas.

7.16.3 Risk of water pipeline bursts leading to water wastages

Pipeline bursts may occur because of interference with the pipelines during future construction activities e.g. road construction works in the project areas or due to lack of maintenance of the pipelines. Loss of water through such bursts shall to revenue loss for Nithi Water and Sanitation Company.

Mitigation measures

- The risk of pipeline bursts is low as the pipeline design, including the selection of pipe material and pipe pressure classes, has been carried out to minimize this risk.
- This risk shall be further minimized through regular inspection, repair, and maintenance of the pipeline by the Operator, NIWASCO.
- Regular check, repair, and maintenance of the water pipeline,
- Activate a community watch group for information sharing on the status of the water line.
- Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas),

7.16.4 Risk of Encroachment and Construction of Structures on the Pipeline Way Leave

Encroachment and construction of structures on water pipelines is common in many areas across the county, however, this impact is less significant due to the fact most of the pipework shall involve replacement of the already existing pipe on the way leaves.

Mitigation measures

- Arrest and prosecution of encroachers as required by Tharaka Nithi County Bylaws on way leaves and Road reserves.
- NIWASCO to undertake awareness campaigns aimed at preventing encroachment.

7.16.5 Visual and landscape impact management

Once the temporary working areas have been reinstated, much of the landscape will return to its former condition. The only persistent visual impacts will take the form of, water tanks, and chambers. This will have minor visual impacts during its operational life.

Mitigation measures

- Elaborate landscaping and maintenance of these sites can limit the viewpoints to the facilities and thus reduce their visual impact.

7.16.6 Increase in Social Vices

There is high likelihood of vandalism of the water tank equipment during the operational stage if proper security measures are not put in place.

Mitigation measures

- Proper security measures should be put in place to guard the equipment 24 hours to reduce cases of vandalism.

7.16.7 Pollution of water and soils

Pollution of water and soil due to leaks and overflows: Leaks and overflows from the chambers can cause contamination of soil, groundwater, and surface water. The excess flows may contain raw sewage and polluted runoff.

Mitigation

- Blockages should be detected and promptly replaced.
- Nithi Water and Sewerage Company to attend to burst pipes promptly to prevent excessive loss of soil.
- Provide high risk areas with appropriate drainage for effective channeling of burst sewage spills;

7.16.8 Health and Safety Risks

Poorly maintained and designed ablution block can lead to dispersal of raw sewage particularly at pit into the environment. These can cause outbreaks of water borne related diseases like cholera and typhoid from contamination of water sources by raw sewage.

Mitigation measures

- Regular check, repair and maintenance of the water pipeline and sewer lines by NIWASCO officials.
- Activate a community watch group for information sharing on the status of the water line and sewer lines.
- Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas)
- Awareness rising among community members not to dump solids in manholes.
- Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations.
- Carry continuous Public Health Awareness

7.17 Decommissioning Phase Positive impact for Water Project

7.17.1 Employment opportunities

Temporary employment opportunities shall be created for the demolition of laid and constructed structures during the decommissioning works.

7.17.2 Environmental rehabilitation

Rehabilitation of site to ensure the site is left as natural as possible close or better than before.

7.18 Decommissioning Phase Negative Impacts for Water Project

7.18.1 Noise Pollution

Activities likely to produce noise during decommissioning include demolition of structures and excavation of pipeline works and structures at the intake areas as well as any staff offices and quarters built on site.

Mitigation measures:

- Schedule noisy activities during the daytime period;
- Use silencers on machines where possible.
- Ensure machinery is well maintained to reduce noise emitted.

7.18.2 Solid Waste Material

It is expected that large amounts of solid waste material arising during decommissioning shall include glass panels, stones, pipes, wood, metal, paper, plastic, equipment, vegetation, etc. The proper disposal of these materials is critical. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment.

Mitigation measures:

- Disposal of solid waste in compliance with EMCA 2006 Waste Management Regulations.
- Segregation of waste to encourage reuse and recycling.
- Ensuring that the contracted waste collector is registered with NEMA to collect and dispose wastes.

7.18.3 Occupational Health and Safety

If not handled with care the demolition may lead to exposure of hazardous chemicals to workers and surrounding communities which poses as health risks to them. Machinery and

equipment used for the same also possess as danger to the workers if not handled well and with the correct PPE.

Mitigation measures:

- Provide the correct PPE for the workers when conducting the demolition activities.
- Conduct training on health and safety procedures to the workers prior to commencement of demolition.
- Proper plans should be made prior to demolition so as to contain the raw sewage and other wastewater that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it.

7.19 Pre-construction phase Positive Impacts for Ablution Block**7.19.1 Documentation and publicity**

The project area shall benefit significantly in terms of the intensive information gathering during the pre-project feasibility study and the pre-project ESIA which shall generate useful reports that shall create important reference points for the area both for scientific research and planning activities.

7.19.2 Employment

Employment opportunities shall be created in the construction of camp sites by the Contractor as well as employment of enumerators during data collection before construction works.

7.20 Pre- Construction Negative impacts for Ablution Block Construction**7.20.1 Temporary land interference**

The proposed project is likely to cause temporary interference with the current state of environment in the area due to the excavation and construction works.

Mitigation Measures

- Notify community members.
- Reinstatement to be done after completion of the project.
- Mark project is to avoid conflicts with other activities

7.20.2 Influx of workers from other areas

The project area might experience an influx of construction workers from other areas who shall come to seek for job opportunities.

Mitigation Measures:

- Effective community engagement and strong grievance mechanisms on matters related to labour.

7.21 Construction Phase Positive Impacts for Ablution Block Construction

The following are the positive impacts during the construction phase of the proposed project:

7.21.1 Employment opportunities

With the construction of the proposed Project, there shall be employment opportunities for both professionals and unskilled workers, earnings from the wages shall improve their living standards. The workers shall include casual labourers, plumbers and engineers who are expected to work for a period of time. Semi-skilled, unskilled labourers and formal employees are expected to obtain gainful employment during the period of construction. With labour intensive construction technologies, the project shall provide employment for youths and provide support to the GoK initiatives on creation of jobs.

Employment opportunities shall also be of benefit in economic and social sense. Economic sense means, that abundant unskilled labour shall be used while social sense signify that the poor community shall be engaged in productive employment other than remaining idle and helpless which in most cases may translate to engagement in crime. Apart from casual labour, semi-skilled and skilled employees are also expected to obtain employment during the construction period. Employment opportunities shall also be of benefit in economic and social sense.

7.21.2 Creation of a market for construction materials

The project shall require materials, some of which shall be sourced locally and some internationally. These include plant steel and plastic pipes, valves, cement, sand, hard-core and chemicals. This shall provide a ready market for suppliers in and outside the project area.

7.21.3 Increased local incomes.

The local community may get extra income from the sale of construction materials from their firms and also renting spaces for camp sites.

7.21.4 Economic growth

Through the use of locally available materials during the construction phase for example pipes and others; the project shall contribute towards growth of the country's economy by contributing to the gross domestic product. The consumption of these materials, oil, fuel and others shall attract taxes.

7.21.5 Injection of money into the local economy

A large sum of the project money shall be released into the local economy due to the construction activities. It is envisaged that during construction a large number of activities shall take place including but not limited to the following listed below.

- Payments for skilled and unskilled labour.
- Purchases of construction materials; and
- Payments for local provisions including fuel, foods and accommodation.

7.22 Construction Phase Negative impacts for Ablution Block Construction

7.22.1 Noise and Excessive Vibrations

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

Mitigation Measures for exposure to Noise and Excessive Vibrations

- Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009.
- Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity.
- Undertake Noise and Vibration Assessments.
- Effective use of appropriate PPE (ear plugs or muffs) by exposed workers and Proper maintenance of machines.
- Any complaints received by the Contractor regarding noise shall be recorded and communicated to the Supervising Engineer for appropriate action.
- The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas.

7.22.2 Air Pollution and Dust Generation

Air Pollution can be caused by emissions from Construction Plant and Equipment and Vehicles. Dust can be generated by vehicles travelling on unpaved roads and tracks, and dust from

exposed, non-vegetated surfaces. Some dust shall also be generated during excavation works, by blowing from dump truck loads.

Mitigation Measures (Air pollution)

- The contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer.
- Workers shall be trained on management of air pollution from vehicles and machinery.
- All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications.
- The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible.
- The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds.
- Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust.
- Water sprays shall be used on all earthwork's areas within 200 meters of human settlement especially during the dry season.

7.22.3 Vegetation Clearing, Soil Erosion and Sedimentation

Construction activities have the potential to clear vegetation and, loosen soils particularly on slopes which can then be washed down into the lower areas (streams and valleys) and soil quality degradation is also likely to occur during construction because of disposal of construction materials on the adjacent lands. It is worth noting that the potential significant impact on flora in the area shall be short term and reversible. No rare, threatened, critically endangered or endemic plant or animal species were observed.

Mitigation Measures

- Reinstatement of the project sites to their original after completion of civil and road works
- All hedges damaged during construction to be reinstated after completion of the Works.
- The contractor to adhere to the delineated construction work area.
- Planting of grass along the way leave and Pipeline friendly tree to be grown after construction.

- Maximum reuse of excavated material.
- Implementation of Soil erosion management in the spoil locations
- Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately.
- Contractor's Camps and Construction Sites to have designated waste collection points,

7.22.4 Solid Wastes Generation from Construction activities

Construction activities at the work sites and Contractor's Camps shall generate some Spoil material, solid wastes such as plastic containers, used tires, metal parts, plastics, and cables. Such material if not mitigated could be washed away to drainage channels and rivers eventually clogging the drainage channels and increasing river sedimentation.

Mitigation measure (Solid Waste Mitigation Measures)

- Maximum reuse of excavated material.
- Implementation of Soil erosion management in the spoil locations
- Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately.
- Contractor's Camps and Construction Sites to have designated waste collection points,
- Contractor shall engage a licensed waster transported to regularly transport accumulated wastes for final disposal at an approved dumping site.
- Environmental Management, Health and Safety Training Programmes to be conducted for Contractor's Staff to create awareness on proper solid wastes management.
- Contractor to provide different bins for segregation of non-hazardous and hazardous wastes for appropriate disposal.
- Tracking of waste to be undertaken to ensure disposal to designated dumping sites.

7.22.5 Impacts on Soils

The Project activities are likely to have minor impacts on soils; these impacts include:

- iv. Soil Erosion
- v. Soil de-stabilization
- vi. Soil pollution.

The impact if not mitigated could result to:

- v. Sediment transfer.
- vi. Reduced rainfall infiltration
- vii. Riverbank damage
- viii. Alteration of the biophysical and chemical component of the soil reducing soil productivity.

Mitigation measures (Soil Erosion)

- The contractor to adhere to the proposed soil conservation practices.
- Proper and compacted back filling.
- The contractor to stick to clear delineation of the construction to avoid vegetation loss.
- Planting of vegetation cover along the pipeline way leave

Mitigation measures (Soil de-stabilization)

- Split compacted area to reduce runoff & re-vegetate where necessary.
- Vehicles to be kept in designated access roads.
- Minimize compaction during stockpiling by placing soil in dry state.

Mitigation measures (Soil Pollution)

- Any polluted soil should be handled with care for proper disposal.
- Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards.
- Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills.
- Excavation materials to be stockpiled at the demarcated location.
- Rehabilitation of the site after construction

7.22.6 Project Impact on Water

The various construction activities may have a negative impact on the existing hydrology via natural drainage patterns. Solid as well as liquid waste if not properly stored or disposed of, may seep into groundwater or find its way into the surface water, thus affecting the water resources.

The project is likely to have less significant impacts to water in terms of:

- iii. Increased Water demand
- iv. Management of Wastewater

This impact if not mitigated could result to

- v. Reduced water quality
- vi. Siltation
- vii. Increased water demand
- viii. Increased toxic levels in soil and water.

Project Impacts on Water Resources can be mitigated as follows.

Mitigation measures (Reduced Water Quality)

- Storing of fuels, oils, and chemicals on impermeable surfaces away from surface drains
- The machines to be properly serviced offsite and maintained to avoid spillage of oil into the water bodies.

Mitigation measures (Siltation, Obstruction and Water Demand)

- Use of soil erosion control measures e.g., construction of gabions, vegetating the site after laying pipes

Mitigation measure (Wastewater Management)

- Grey water to be contained and properly channelled.
- Onsite treatment of grey water by the facility approved by the resident engineer.
- Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies.
- Prompt action to be taken by the Contractor in case of any pollution incident.
- Ensure prompt reinstatement of drainage channels following trenching and backfilling and providing for temporary drains.

7.22.7 Accidental Oil and fuel Spills and Leaks

The project shall involve use of plant and equipment that shall use diesel oils. In the event that these oils accidentally leak into the environment, they could result to significant contamination of soil, surface and underground water resources.

Oils Spills can be mitigated as follows.

- Checking and regular servicing of Equipment.
- Re-fuelling at safe designated locations.
- Storage areas to be purpose-built with secondary containment.
- Use of spill kits and applications of emergency spill procedures.
- Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer acts as sink to potential oil spills and shall be replaced when saturated.
- Vehicle maintenance is to be done in impervious concrete platforms and grease and oil traps to be used.
- Safe disposal of used oil through licensed hazardous waste handler.

7.22.8 Loss of Temporal Assets and Sources of Livelihood

No Impact is anticipated to people's assets and sources of livelihood due to the following reasons.

- iii) No anticipated displacement was identified during social screening studies undertaken during the ESIA.
- iv) Any displacement that may be identified during construction to be dealt with on case-by-case basis

7.22.9 Disruption of Public Utilities

The proposed project shall affect other public utility infrastructure which include, existing water infrastructure, internal roads within the project areas, and storm water drainage channels.

Mitigation Measures for Disruption of Public Utilities

- Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works.
- Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services.
- Consultation and liaison with the various service providers shall be undertaken throughout the project life.

7.22.10 Risk of Accidents at Work Sites

Accidents during construction activities may occur due to failure to use Personal Protective Equipment (PPE) by workers on site and members of the public illegally accessing the work sites, collapsing of pipeline trenches, traffic accidents involving construction vehicles, electrical safety risks. Accidents may result in injuries or even death of workers or members of the public.

Mitigation Measures for Accidents at Work sites

- Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer. The plan shall comprehensively analyse all potential safety and health risks and provide corresponding prevention measures, including emergency response plan.
- All workers to be inducted and trained on specific safety measures regularly throughout the construction period.
- As applicable, works including operating equipment and electromechanical installations shall be performed only by duly qualified personnel.
- Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls, and helmets. Use of PPE to be enforced by the Supervising Engineer.
- Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles. Trained first aiders to be available on site at any time works are ongoing. The ratio of first aiders to workers on site shall be in line with the OSHA First Aid Rules
- Isolate the site for access by the local communities during the construction for their safety and health. Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public.
- Strict use of warning signage's and tapes where the trenches are open and at other active construction sites.
- Contractor to Employ and train Road Safety Marshalls who shall be responsible for management of traffic on site.
- Contractor to provide a Traffic Management Plan during construction to be approved by the Supervising Engineer

- Contractor to have designated personnel among the employees to oversee implementation of safety measures at the work sites.
- Contractor's trenching method statement shall specifically incorporate measures that ensure trenching and pipe laying is safely conducted.
- Limit lengths of open trenches to what can be backfilled within a shortest period feasible
- Contractor shall ensure all open trenches are kept drained.
- Provide and maintain serviceable and appropriate fire fighting equipment at the work sites, including fuel storage areas, garages, and offices. Workers shall also be drilled on emergency fire response in line with the OSHA 2007 requirements.
- Maintain incident register and undertake investigations on any major incidents and accidents to inform further preventive actions as necessary.

7.22.11 Traffic Congestion and Inconveniences

Traffic congestion is anticipated from site-related traffic from Contractor vehicles. This may interfere with socio-economic activities which majorly rely on the transport network affected by the construction activities. The proposed project would have minor, short-term impacts on transportation, as the pipelines are anticipated to be installed within the road reserve.

Mitigation Measures for traffic congestion

- The contractor shall develop a traffic management plan.
- The Contractor will provide temporary legible and reflective road signs or notices to indicate ongoing works and deviation routes to guide motorists. The Contractor together with the Resident Engineer Should Plan itineraries for site traffic daily and avoid peak traffic periods.
- The Contractor will provide traffic controllers/marshals at active construction sites to man and control the traffic.
- The Resident Engineer and Contractor shall choose traffic routes to reduce the impact in the neighbourhood avoiding, as far as practical any sensitive areas.
- The Contractor should affect traffic controls and cleanliness to avoid congestion and truck accidents on roads.
- For the site traffic the Contractor must ensure that they
 - ✓ Only Park in designated parking areas.
 - ✓ Don't block pedestrian routes.

- ✓ Don't block traffic routes.
- ✓ Obey the speed limit.
- ✓ The resident Engineer must ensure that the Contractor:
 - Introduces segregated pedestrian walkways.
 - Introduces speed limits.
 - Reduces the need for reversing vehicles, by introducing a one-way system.
 - Uses a qualified Banks man to control deliveries and reversing vehicles.
 - Designates loading/unloading areas.
- The resident Engineer is to ensure that the Contractor:
 - ✓ Introduces segregated pedestrian walkways.
 - ✓ Introduces and enforces speed limits particularly in the residential areas.
 - ✓ Reduces the need for reversing vehicles, by introducing a one-way system.
 - ✓ Uses a qualified banks man to control deliveries and reversing vehicles.
 - ✓ Designates loading/unloading areas.
- Provision of a road safety analysis and campaign, including discussing with the local community on provision of road suitable crossing facilities for domestic animals, children, etc.
- Drivers and equipment operators drive safe within the project area and sign Code of Conduct

7.22.12 Labour influx and Sexual Offences to Minors

The project at construction phase has the potential of attracting workers from various regions to Marimanti informal settlement and their surrounding environs. If the construction tender is awarded to an international contractor, chances of foreign worker's influx to the project area are high. Labour influx has potential of triggering the following impacts.

- vi. Increased HIV/AIDS
- vii. Early pregnancies
- viii. School dropout
- ix. Sexual offences

x. Gender based violence.

Mitigation measures (Labour Influx)

- Effective community engagement and strong grievance mechanisms on matters related to labour.
- Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx.
- Proper records of labour force on site while avoiding child and forced labour.
- Fair treatment, non-discrimination, and equal opportunity of workers.
- Comply to provisions of WIBA 2007 and IFC PS 2 on labour and Working Conditions, and ILO Conventions 87, 98, 29,105,138,182,100,111
- Develop and implement a children Protection Strategy

7.22.13 Increased Transmission of HIV/AIDS

The project shall attract new people to the project area seeking employment during the construction period and this can lead to increased transmission of HIV/AIDS and or the other sexually transmitted diseases (STDs). This may result from increased incomes of workers whereby some may try to seek for sexual favours using their incomes. The fact that some the contractors and workers shall be away from their homes may lead them seeking sexual satisfaction from the area residents.

Mitigation Measures for Increased HIV transmission

- Offer HIV/AIDS sensitization to workers in collaboration with the local health facilities.
- Offer VCT services to the community members with the help of the local Health facilities.
- Contractor to provide standard quality condoms to personnel on site.

7.22.14 Human Rights Principles and Gender Inclusivity

The possibility of the works Contractor not adhering to requirements of Human Rights Principles and Gender Inclusivity could trigger resistance from Civil Society Organization (CSO) through demonstrations. This could lead to delay substantial delay in Project implementation.

Mitigation measures to non-adherence to Human Rights Principles and Gender inclusivity

- Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule.

- Comply to provisions of guidelines on incorporating Human Rights Standards and Principles, including Gender,
- Protecting human risk areas associated with, Disadvantaged Groups, interfering with Participation Rights, and interfering with Labour Rights

7.22.15 Increased Crime and Insecurity

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

Mitigation Measures for increased Crime and Insecurity

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

7.22.16 Gender based violence.

GBV constitutes acts of gross misconduct and are therefore grounds for sanctions, penalties and/or termination of employment. All forms of GBV including grooming are unacceptable be it on the work site, the work site surroundings, or at workers' camps. Prosecution of those who commit to be pursued.

This impact is triggered during Project Construction Phase is likely to occur. Therefore, below listed provisions are provided to mitigate against such GBV and SH related Project induced impacts.

Mitigation measures for GBV

- The Contractor shall mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule.
- The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women, youth and people with disability and VMGs.
- Protecting Human Risk Areas Associated with, Disadvantaged Groups, interfering with Participation Rights and interfering with Labour Rights:
- Treat women and children (persons under the age of 18) with respect regardless of race, colour, language, religion, political or other opinion, national, ethnic, or social origin, property, disability, birth or other status.

- Do not use language or behaviour towards women or children that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
- Sexual activity with children under 18—including through digital media is prohibited. Mistaken belief regarding the age of a child and consent from the child is not a defence.
- Exchange of money, employment, goods, or services for sex, including sexual favours or other forms of humiliating, degrading or exploitative behaviour is prohibited.
- Sexual interactions between contractor's and consultant's employees at any level and member of the communities surrounding the workplaces that are not agreed to with full consent by all parties involved in the sexual act are prohibited. This includes relationships involving the withholding, promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex – such sexual activity is considered "non-consensual" within the scope of this Code.
- Where an employee develops concerns or suspicions regarding acts of GBV by a fellow worker, whether in the same contracting firm or not, he or she must report such concerns in accordance with Standard Reporting Procedures.
- All employees are required to attend an induction-training course prior to commencing work on site to ensure they are familiar with the GBV Code of Conduct.
- All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the institutional GBV Code of Conduct.

7.22.17 Sexual Exploitation and Abuse (SEA)

This impact refers to sexual exploitation and abuse committed by project staff against communities and represents a risk at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project. Sexual exploitation can also be among workers and project staff against workers.

Mitigation Measures

- Develop and implement a SEA action plan with an accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).
- The SEA action plan shall include how the project shall ensure necessary steps are in place for:

- Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials.
- Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management.
- Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of Sexual Exploitation and Abuse (SEA) awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their SEA-related rights.

Management and Coordination: including integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers

7.22.18 Child Labour and Protection

The possibility of contractor children abuse is through hiring of child labour, also labour force on site might abuse children within the Project area through sexual advance that could lead to early pregnancies and school dropout including exposure to communicable diseases such as HIV and AIDS. The contractor shall undertake the below listed mitigation measures.

Mitigation Measures

- The contractor shall develop and implement a Children Protection Strategy that shall ensure minors are protected against negative impacts associated by the Project including SEA.
- All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour.
- Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014

- Wherever possible, ensure that another adult is present when working in the proximity of children.
- Not invite unaccompanied children to worker's home unless they are at immediate risk of injury or in physical danger.
- Refrain from physical punishment or discipline of children.
- Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.

Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation.

7.22.19 Conflicts between Contractor and Community

During construction there is a possibility of conflict arising between the community and contractor with regard to;

- Disruption of the day to day activities of the community;
- Nuisance caused by air/dust and noise pollution;
- Impacts of water pollution and disruption of piped water supply;
- Over exploitation of local material sites by the contractor;
- Immoral social/sexual relations between the contractor's workers and local population;
- Destruction of crops and property along the road reserve;
- Allocation of employment opportunities;
- Issue of access culverts to homesteads.

Mitigation Measures

- Establishment of a formal grievance and redress mechanism by the supervising consultant/Engineer;
- The Contractor shall be required to minimize the possibility of occurrence of grievances with the local community;
- The contractor shall maintain a Complaints Register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken.
- Copies of received complaints shall be copied to the supervising consultant/Engineer and issues to be addressed accordingly.

7.22.20 Project Intervention Priority Conflicts

This risk may arise from the exclusions of some beneficiaries due to unfriendly designs and lack of implementation of projects prioritized by the community

Mitigation Measure

- Continuous community engagement and participation
- Establishment of a formal grievance and redress mechanism
- Maintaining a complaints register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken.

7.23 Operation phases Positive Impacts for the Ablution Block Project

7.23.1 Creation of employment

During operational phase, there shall be employment opportunities especially for those who shall be employed to manage ablution block. This shall improve their living standards.

7.23.2 Creation of Wealth

The proposed project shall ultimately provide revenues to the beneficiaries and expand the wealth base for the nation. It shall pump both liquefied and tied up wealth hence making the nation gain. It shall also go a long way in uplifting Tharaka Nithi County and its neighbourhood as a whole. Once the people shall be empowered in the project area, some shall invest and develop the nearby towns.

7.23.3 Reduced exposure to health risks and improved nutrition

Improved sanitation services will lead to reduced cases of water borne diseases associated with pollution of water resources and drinking water, this will also cause improved water, Health, and Sanitation status.

7.24 Operation Phase Negative Impacts for Ablution Block

7.24.1 Visual and landscape impact management

Once the temporary working areas have been reinstated, much of the landscape will return to its former condition. The only persistent visual impacts will take the form of, water tanks, and chambers. This will have minor visual impacts during its operational life.

Mitigation measures

- Elaborate landscaping and maintenance of these sites can limit the viewpoints to the facilities and thus reduce their visual impact.

7.24.2 Risk of vandalism of the ablution block facilities

There is high likelihood of vandalism of the ablution block equipment during the operational stage if proper security measures are not put in place.

Mitigation measures

- This shall require constant inspection by NIWASCO officials
- Conduct public sensitization programs on importance not interfering with the ablution block

7.24.3 Pollution of water and soils

Pollution of water and soil due to leaks and overflows: Leaks and overflows from the sewerage system/septic tanks can cause contamination of soil, groundwater, and surface water. Overflows occur when the collection system cannot manage the volume of wastewater, for example due to high flows during rain events or blockages.

Mitigation

- Blockages should be detected and promptly replaced;
- NIWASCO to attend to burst and overflows of septic tanks promptly to prevent excessive loss of soil;
- Provide high risk areas with appropriate drainage for effective channelling of burst sewage spills;

7.24.4 Health and Safety Risks

Poorly maintained and designed ablution block can lead to dispersal of raw sewage particularly at pit into the environment. These can cause outbreaks of water borne related diseases like cholera and typhoid from contamination of water sources by raw sewage.

Mitigation measures

- Regular check, repair and maintenance of the ablution block and septic tanks by NIWASCO officials.
- Carry continuous Public Health Awareness
- Provision of appropriate PPEs for workers

7.25 Decommissioning Phase Positive impact for Ablution Block

7.25.1 Employment opportunities

Temporary employment opportunities shall be created for the demolition of laid and constructed structures during the decommissioning works.

7.25.2 Environmental rehabilitation

Rehabilitation of site to ensure the site is left as natural as possible close or better than before.

7.26 Decommissioning Phase Negative Impacts Ablution Block

7.26.1 Noise Pollution

Activities likely to produce noise during decommissioning include demolition of structures and excavation of pipeline works and structures at the intake areas as well as any staff offices and quarters built on site.

Mitigation measures:

- Schedule noisy activities during the daytime period;
- Use silencers on machines where possible.
- Ensure machinery is well maintained to reduce noise emitted.

7.26.2 Solid Waste Material

It is expected that large amounts of solid waste material arising during decommissioning shall include glass panels, stones, pipes, wood, metal, paper, plastic, equipment, vegetation, etc. The proper disposal of these materials is critical. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment.

Mitigation measures:

- Disposal of solid waste in compliance with EMCA 2006 Waste Management Regulations.
- Segregation of waste to encourage reuse and recycling.
- Ensuring that the contracted waste collector is registered with NEMA to collect and dispose wastes.

7.26.3 Occupational health and safety

If not handled with care the demolition may lead to exposure of hazardous chemicals to workers and surrounding communities which poses as health risks to them. Machinery and equipment used for the same also possess as danger to the workers if not handled well and with the correct PPE.

Mitigation measures:

- Provide the correct PPE for the workers when conducting the demolition activities.
- Conduct training on health and safety procedures to the workers prior to commencement of demolition.
- Proper plans should be made prior to demolition so as to contain the raw sewage and other wastewater that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it.

7.27 Impact Analysis

The magnitude of each impact is described in terms of being significant, minor or negligible, temporary or permanent, long term or short term, specific (localized) or widespread and reversible or irreversible. These parameters are indicated in the assessment table below. Generally, low impacts have no obvious long-term consequences and are regarded as being minor. But those with long-term repercussions are classified as major. A summary of the anticipated impacts for the three (3) proposed interventions are as represented in Tables 7.2-7-4 based on perceived environmental impact levels and mitigations.

Table 7:2: Impact analysis for roads

Associated Impacts	Impact Levels	Management Actions
Pre-Construction Phase		
• Temporary land interference	Medium	<ul style="list-style-type: none"> Notify community members Reinstatement to be done after completion of the project Mark project areas to avoid conflicts with other activities
• Labour influx	Medium	<ul style="list-style-type: none"> Effective community engagement and strong grievance mechanisms on matters related to labour
Construction Phase		
• Noise and excessive vibrations	Medium	<ul style="list-style-type: none"> Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009. The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas; Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity; Undertake Noise and Vibration Assessments;
• Air pollution and dust generation	Medium	<ul style="list-style-type: none"> The Contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer; Workers shall be trained on management of air pollution from vehicles and machinery. All Construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications; The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible

Associated Impacts	Impact Levels	Management Actions
		<ul style="list-style-type: none"> The Contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds; Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust;
<ul style="list-style-type: none"> Vegetation Cover destruction 	Low	<ul style="list-style-type: none"> Reinstatement of the project sites to their original after completion of road works All hedges damaged during construction to be reinstated after completion of the Works The Contractor to adhere to the delineated construction work area.
<ul style="list-style-type: none"> Generation of Solid waste 	Medium	<ul style="list-style-type: none"> Maximum reuse of excavated material. Implementation of Soil erosion management in the spoil locations Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately Contractor's Camps and Construction Sites to have designated waste collection points,
<ul style="list-style-type: none"> Removal of vegetation 	Low	<ul style="list-style-type: none"> The Contractor to adhere to the proposed soil conservation practices. Proper and compacted back filling. The contractor to stick to clear delineation of the construction to avoid vegetation loss. Split compacted area to reduce runoff & re-vegetate where necessary Vehicles to be kept in designated access roads. Minimize compaction during stockpiling by placing soil in dry state Any polluted soil should be handled with care for proper disposal. Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills. Excavation materials to be stock piled at the demarcated location. Rehabilitation of the site after construction

Associated Impacts	Impact Levels	Management Actions
• Water pollution	Medium	<ul style="list-style-type: none"> • Storing of fuels, oils and chemicals beneath impermeable away from surface drains • The machines to be properly serviced offsite and maintained to avoid spillage of effluents into the water bodies • Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies. • Prompt action to be taken by the Contractor in case of any pollution incident.
• Accidental Oil and fuel Spills and Leaks	Medium	<ul style="list-style-type: none"> • Checking and regular servicing of Equipment. • Re-fuelling at safe locations, • Use of spill kits and applications of emergency spill procedures. • Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and shall be replaced when saturated. • Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.
• Loss of temporary assets and sources of livelihood	Low	<ul style="list-style-type: none"> • No anticipated displacement was identified during social screening studies undertaken.
• Disruption of public utilities	Medium	<ul style="list-style-type: none"> • Contractor to carry out piloting to locate services such as pipes and cables along before commencing excavation works. • Consultation and liaison with the various service providers shall be undertaken throughout the project life.
• Risk of accidents at work site	Medium	<ul style="list-style-type: none"> • Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles • Isolate the site for access by the local communities during the construction for their safety

Associated Impacts	Impact Levels	Management Actions
		<p>and health</p> <ul style="list-style-type: none"> • Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public. • Strict use of warning signage and tapes in open areas
<ul style="list-style-type: none"> • Traffic congestion 	Medium	<ul style="list-style-type: none"> • The Contractor shall develop a traffic management plan; • The Contractor should provide temporary road signs or notices to indicate ongoing works; • The Contractor together with the Resident Engineer should Plan itineraries for site traffic on a daily basis and avoid peak traffic periods;
<ul style="list-style-type: none"> • Labour influx and sexual offences to minors 	Medium	<ul style="list-style-type: none"> • Effective community engagement and strong grievance mechanisms on matters related to labour. • Effective contractual obligations for the Contractor to adhere to the mitigation of risks against labour influx • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination, and equal opportunity of workers.
<ul style="list-style-type: none"> • Increased Transmission of HIV/AIDS 	Medium	<ul style="list-style-type: none"> • Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Baraza. • Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members • Ensure safety of women and girls in provision of VCT services.
<ul style="list-style-type: none"> • Human Rights Principles and Gender Inclusivity 	Medium	<ul style="list-style-type: none"> • Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. • Comply with provisions of guidelines on incorporating Human Rights Standards and Principles.
<ul style="list-style-type: none"> • Increased crime and 	Medium	<ul style="list-style-type: none"> • Contractor and Supervision Team to liaise regularly with the Local Administration and Police

Associated Impacts	Impact Levels	Management Actions
insecurity		<p>Service to address any security and crime arising during project implementation.</p> <ul style="list-style-type: none"> Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices
<ul style="list-style-type: none"> Increased GBV 	Medium	<ul style="list-style-type: none"> The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse The Contractor shall implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: <ul style="list-style-type: none"> effective and on-going community engagement and consultation, particularly with women and girls; Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. Ensure clear human resources policy against sexual harassment that is aligned with national law Integrate provisions related to sexual harassment in the employee COC Ensure appointed human resources personnel to manage reports of sexual harassment according to policy The Contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. The Contractor shall ensure adequate referral mechanisms are in place if a case of GBV at the community level
<ul style="list-style-type: none"> Sexual Exploitation and Abuse by project workers against community members 	Medium	<ul style="list-style-type: none"> Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).

Associated Impacts	Impact Levels	Management Actions
		<ul style="list-style-type: none"> The SEA action plan shall include how the project shall ensure necessary steps are in place for: <ul style="list-style-type: none"> Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials. Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management. Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights. Management and Coordination: including integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.
<ul style="list-style-type: none"> Child labour and protection 	<p>Low</p> <p>In Jv with</p>	<ul style="list-style-type: none"> The Contractor shall develop and implement a Children Protection Strategy that shall ensures minors are protected against negative impacts associated by the Project including SEA. All staff of the Contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior. Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014

Associated Impacts	Impact Levels	Management Actions
		<ul style="list-style-type: none"> Wherever possible, ensure that another adult is present when working in the proximity of children. Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger. Refrain from physical punishment or discipline of children
Operation phase		
Visual and landscape impact management	• Medium	<ul style="list-style-type: none"> Elaborate landscaping and maintenance of these sites can limit the viewpoints to the facilities and thus reduce their visual impact.
Decommissioning Phase		
Solid Waste Generation	Medium	<p>All removed materials that shall not be used for other purposes must be removed and recycled/reused as far as possible;</p> <p>Where recycling/reuse of the removed materials and other demolition waste is not possible; the materials should be taken to a licensed waste disposal site or arrangements made with the County Government;</p> <p>Donate reusable demolition waste to charitable organizations, individuals and institutions;</p>
Noise pollution	Medium	<p>Prepare a decommissioning plan to guide activities;</p> <p>Monitor noise levels as per the NEMA Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 & OSHA, 2007;</p> <p>The noise emission characteristics should be considered during selection and mobilization of decommissioning equipment; and</p> <p>Sensitize staff to switch off machinery and vehicles when not in use;</p>

Associated Impacts	Impact Levels	Management Actions
Occupational Health and Safety	Medium	<ul style="list-style-type: none"> Provide the correct PPE for the workers when conducting the demolition activities; Conduct training on health and safety procedures to the workers prior to commencement of demolition; Proper plans should be made prior to demolition so as to contain the raw sewage and other waste water that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it.

Table 7:3: Impact analysis for Water

Associated Impacts	Impact Levels	Management Actions
Pre-Construction Phase		
• Temporary land interference	Medium	<ul style="list-style-type: none"> Notify community members Reinstatement to be done after completion of the project Mark project are to avoid conflicts with other activities
• Labour influx	Medium	<ul style="list-style-type: none"> Effective community engagement and strong grievance mechanisms on matters related to labour
Construction Phase		
• Noise and excessive vibrations	Medium	<ul style="list-style-type: none"> Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009. The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas; Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity; Undertake Noise and Vibration Assessments;
• Air pollution and dust generation	Medium	<ul style="list-style-type: none"> The Contractor to comply with the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer; Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications; The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible The Contractor shall not carry out dust generating activities (excavation, handling and transport

Associated Impacts	Impact Levels	Management Actions
		<p>of soils) during times of strong winds;</p> <ul style="list-style-type: none"> • Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust;
• Vegetation Cover destruction	Low	<ul style="list-style-type: none"> • Reinstatement of the project sites to their original after completion of civil works • All hedges damaged during construction to be reinstated after completion of the Works • The Contractor to adhere to the delineated construction work area. • Planting of grass along the way leave and Pipeline friendly tree to be grown after construction
• Generation of Solid waste	Medium	<ul style="list-style-type: none"> • Maximum reuse of excavated material. • Implementation of Soil erosion management in the spoil locations. • Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately • Contractor's Camps and Construction Sites to have designated waste collection points,
• Removal of vegetation	Low	<ul style="list-style-type: none"> • The Contractor to adhere to the proposed soil conservation practices. • Proper and compacted back filling. • The Contractor to stick to clear delineation of the construction to avoid vegetation loss. • Planting of vegetation cover along the pipeline way leave • Split compacted area to reduce runoff & re-vegetate where necessary • Vehicles to be kept in designated access roads. • Minimize compaction during stockpiling by placing soil in dry state • Any polluted soil should be handled with care for proper disposal. • Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards • Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills. • Excavation materials to be stock piled at the demarcated location. • Rehabilitation of the site after construction

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> • Water pollution 	Medium	<ul style="list-style-type: none"> • Storing of fuels, oils and chemicals beneath impermeable away from surface drains • The machines to be properly serviced offsite and maintained to avoid spillage of effluents into the water bodies • Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies. • Prompt action to be taken by the contractor in case of any pollution incident.
<ul style="list-style-type: none"> • Accidental Oil and fuel Spills and Leaks 	Medium	<ul style="list-style-type: none"> • Checking and regular servicing of equipment. • Re-fuelling at safe locations, • Use of spill kits and applications of emergency spill procedures. • Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and shall be replaced when saturated. • Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.
<ul style="list-style-type: none"> • Loss of temporary assets and sources of livelihood 	Low	<ul style="list-style-type: none"> • No anticipated displacement was identified during social screening studies undertaken.
<ul style="list-style-type: none"> • Disruption of public utilities 	Medium	<ul style="list-style-type: none"> • Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works. • Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services. • Consultation and liaison with the various service providers shall be undertaken throughout the project life.

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> • Risk of accidents at work site 	Medium	<ul style="list-style-type: none"> • Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles • Isolate the site for access by the local communities during the construction for their safety and health • Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public. • Strict use of warning signage and tapes where the trenches are open and at other active construction sites
<ul style="list-style-type: none"> • Traffic congestion 	Medium	<ul style="list-style-type: none"> • The Contractor shall develop a traffic management plan; • The Contractor should provide temporary road signs or notices to indicate ongoing works; • The Contractor together with the Resident Engineer should Plan itineraries for site traffic on a daily basis and avoid peak traffic periods;
<ul style="list-style-type: none"> • Labour influx and sexual offences to minors 	Medium	<ul style="list-style-type: none"> • Effective community engagement and strong grievance mechanisms on matters related to labour. • Effective contractual obligations for the Contractor to adhere to the mitigation of risks against labour influx • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination, and equal opportunity of workers.
<ul style="list-style-type: none"> • Increased Transmission of HIV/AIDS 	Medium	<ul style="list-style-type: none"> • Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Baraza. • Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members • Ensure safety of women and girls in provision of VCT services.

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> Human Rights Principles and Gender Inclusivity 	Medium	<ul style="list-style-type: none"> Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. Comply with provisions of guidelines on incorporating Human Rights Standards and Principles.
<ul style="list-style-type: none"> Increased crime and insecurity 	Medium	<ul style="list-style-type: none"> Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices
<ul style="list-style-type: none"> Increased GBV 	Medium	<ul style="list-style-type: none"> The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse The contractor shall implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: <ul style="list-style-type: none"> effective and on-going community engagement and consultation, particularly with women and girls; Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. Ensure clear human resources policy against sexual harassment that is aligned with national law Integrate provisions related to sexual harassment in the employee COC Ensure appointed human resources personnel to manage reports of sexual harassment according to policy The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. The contractor shall ensure adequate referral mechanisms are in place if a case of GBV at the community level

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> Sexual Exploitation and Abuse by project workers against community members 	Medium	<ul style="list-style-type: none"> Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). The SEA action plan shall include how the project shall ensure necessary steps are in place for: <ul style="list-style-type: none"> Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials. Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management. Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights. Management and Coordination: including integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.
<ul style="list-style-type: none"> Child labour and protection 	Low	<ul style="list-style-type: none"> The contractor shall develop and implement a Children Protection Strategy that shall ensure minors are protected against negative impacts associated by the Project including SEA. All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior

Associated Impacts	Impact Levels	Management Actions
		<ul style="list-style-type: none"> Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 Wherever possible, ensure that another adult is present when working in the proximity of children. Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger. Refrain from physical punishment or discipline of children
Operation phase		
Risk of illegal connection and vandalism of the water pipeline	• Medium	<ul style="list-style-type: none"> This shall require constant inspection by NIWASCO officials and installation of leak and burst detectors at designated areas along the pipeline. Conduct public sensitization programs on importance not interfering with the water pipeline and the need to seek official water connection from NIWASCO
Increased domestic wastewater generation.	Medium	<ul style="list-style-type: none"> The Client to consider construction of a sewerage system in the project areas
Risk of water pipeline bursts leading to water wastage	Low	<ul style="list-style-type: none"> Regular check, repair and maintenance of the water pipeline Activate a community watch group for information sharing on the status of the water line Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas) The risk of pipeline bursts is low as the pipeline design, including the selection of pipe material and pipe pressure classes, has been carried out so as to minimize this risk. This risk shall be further minimized through regular inspection, repair and maintenance of the pipeline by the Operator, NIWASCO
Risk of encroachment and construction of structures on the pipeline way leave	Low	<ul style="list-style-type: none"> Arrest and prosecution of encroachers as required by Tharaka Nithi County Bylaws on Way Leaves and Road Reserves NIWASCO to undertake awareness campaigns aimed at preventing encroachment

Associated Impacts	Impact Levels	Management Actions
Health and Safety Risks	Medium	<ul style="list-style-type: none"> Regular check, repair and maintenance of the water pipeline by NIWASCO officials. Activate a community watch group for information sharing on the status of the water line and sewer lines Implement a leak detection and repair program (including records of past leaks and unaccounted-for water to identify potential problem areas) Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations. Carry continuous Public Health Awareness
Pollution of water and soils	Medium	<ul style="list-style-type: none"> Blockages should be detected and promptly replaced. Nithi Water and Sewerage Company to attend to burst pipes promptly to prevent excessive loss of soil. Provide high risk areas with appropriate drainage for effective channeling of burst sewage spills.

Table 7:4: Impact analysis for Ablution Block

Associated Impacts	Impact Levels	Management Actions
		Construction Phase
• Noise and excessive vibrations	Medium	<ul style="list-style-type: none"> • Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009. • The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas; • Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity; • Undertake Noise and Vibration Assessments;
• Air pollution and dust generation	Medium	<ul style="list-style-type: none"> • The Contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer; • Workers shall be trained on management of air pollution from vehicles and machinery. • All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications; • The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible • The Contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds; • Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust;
• Vegetation Cover destruction	Low	<ul style="list-style-type: none"> • Reinstatement of the project sites to their original after completion of works • All hedges damaged during construction to be reinstated after completion of the works • The Contractor to adhere to the delineated construction work area.

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> • Generation of Solid waste 	Medium	<ul style="list-style-type: none"> • Maximum reuse of excavated material. • Implementation of Soil erosion management in the spoil locations • Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately • Contractor's Camps and Construction Sites to have designated waste collection points,
<ul style="list-style-type: none"> • Removal of vegetation 	Low	<ul style="list-style-type: none"> • The contractor to adhere to the proposed soil conservation practices. • Proper and compacted back filling. • The Contractor to stick to clear delineation of the construction to avoid vegetation loss. • Split compacted area to reduce runoff & re-vegetate where necessary • Vehicles to be kept in designated access roads. • Minimize compaction during stockpiling by placing soil in dry state • Any polluted soil should be handled with care for proper disposal. • Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards • Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills. • Excavation materials to be stock piled at the demarcated location. • Rehabilitation of the site after construction
<ul style="list-style-type: none"> • Water pollution 	Medium	<ul style="list-style-type: none"> • Storing of fuels, oils and chemicals beneath impermeable away from surface drains • The machines to be properly serviced offsite and maintained to avoid spillage of effluents into the water bodies • Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies. • Prompt action to be taken by the contractor in case of any pollution incident.

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> • Accidental Oil and fuel Spills and Leaks 	Medium	<ul style="list-style-type: none"> • Checking and regular servicing of Equipment. • Re-fuelling at safe locations, • Use of spill kits and applications of emergency spill procedures. • Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and shall be replaced when saturated. • Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.
<ul style="list-style-type: none"> • Loss of temporary assets and sources of livelihood 	Low	<ul style="list-style-type: none"> • No anticipated displacement was identified during social screening studies undertaken.
<ul style="list-style-type: none"> • Disruption of public utilities 	Medium	<ul style="list-style-type: none"> • Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works.
<ul style="list-style-type: none"> • Risk of accidents at work site 	Medium	<ul style="list-style-type: none"> • Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles • Isolate the site for access by the local communities during the construction for their safety and health • Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public. • Strict use of warning signage and tapes where the trenches are open and at other active construction sites
<ul style="list-style-type: none"> • Traffic congestion 	Medium	<ul style="list-style-type: none"> • The contractor shall develop a traffic management plan; • The Contractor should provide signages or notices to indicate ongoing works;

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> • Labour influx and sexual offences to minors 	Medium	<ul style="list-style-type: none"> • Effective community engagement and strong grievance mechanisms on matters related to labour. • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination, and equal opportunity of workers.
<ul style="list-style-type: none"> • Increased Transmission of HIV/AIDS 	Medium	<ul style="list-style-type: none"> • Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Baraza. • Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members • Ensure safety of women and girls in provision of VCT services.
<ul style="list-style-type: none"> • Human Rights Principles and Gender Inclusivity 	Medium	<ul style="list-style-type: none"> • Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. • Comply with provisions of guidelines on incorporating Human Rights Standards and Principles.
<ul style="list-style-type: none"> • Increased crime and insecurity 	Medium	<ul style="list-style-type: none"> • Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. • Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices
<ul style="list-style-type: none"> • Increased GBV 	Medium	<ul style="list-style-type: none"> • The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse • The contractor shall implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: <ul style="list-style-type: none"> - effective and on-going community engagement and consultation, particularly with women and girls;

Associated Impacts	Impact Levels	Management Actions
		<ul style="list-style-type: none"> - Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. • Ensure clear human resources policy against sexual harassment that is aligned with national law • Integrate provisions related to sexual harassment in the employee COC • Ensure appointed human resources personnel to manage reports of sexual harassment according to policy • The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. • The contractor shall ensure adequate referral mechanisms are in place if a case of GBV at the community level
<ul style="list-style-type: none"> • Sexual Exploitation and Abuse by project workers against community members 	<ul style="list-style-type: none"> Medium 	<ul style="list-style-type: none"> • Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). • The SEA action plan shall include how the project shall ensure necessary steps are in place for: <ul style="list-style-type: none"> - Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials. - Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management. - Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights. • Management and Coordination: including integration of SEA in job descriptions, employment

Associated Impacts	Impact Levels	Management Actions
		contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.
• Child labour and protection	Low	<ul style="list-style-type: none"> The contractor shall develop and implement a Children Protection Strategy that shall ensures minors are protected against negative impacts associated by the Project including SEA. All staff of the Contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 Wherever possible, ensure that another adult is present when working in the proximity of children. Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger. Refrain from physical punishment or discipline of children
Operation phase		
Health and Safety Risks	Medium	<ul style="list-style-type: none"> Regular check, repair and maintenance of the water pipeline by NIWASCO officials. Activate a community watch group for information sharing on the status of the water line and sewer lines Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas) Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations. Carry continuous Public Health Awareness
Decommissioning Phase		

Associated Impacts	Impact Levels	Management Actions
Solid Waste Generation	Medium	<ul style="list-style-type: none"> • All removed materials that shall not be used for other purposes must be removed and recycled/reused as far as possible;
		<ul style="list-style-type: none"> • Where recycling/reuse of the removed materials and other demolition waste is not possible; the materials should be taken to a licensed waste disposal site or arrangements made with the County Government;
		<ul style="list-style-type: none"> • Donate reusable demolition waste to charitable organizations, individuals and institutions;
Noise pollution	Medium	<ul style="list-style-type: none"> • Prepare a decommissioning plan to guide activities; • Monitor noise levels as per the NEMA Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 & OSHA, 2007; • The noise emission characteristics should be considered during selection and mobilization of decommissioning equipment; and • Sensitize staff to switch off machinery and vehicles when not in use;
Occupational Health and Safety	• Medium	<ul style="list-style-type: none"> • Provide the correct PPE for the workers when conducting the demolition activities; • Conduct training on health and safety procedures to the workers prior to commencement of demolition; <ul style="list-style-type: none"> - Proper plans should be made prior to demolition so as to contain the raw sewage and other waste water that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it.

Table 7:5: Impact analysis for Ablution Block

Associated Impacts	Impact Levels	Management Actions
Pre-Construction Phase		
• Temporary land	Medium	<ul style="list-style-type: none"> • Notify community members

Associated Impacts	Impact Levels	Management Actions
interference		<ul style="list-style-type: none"> Reinstatement to be done after completion of the project Mark project areas to avoid conflicts with other activities
• Labour influx	Medium	<ul style="list-style-type: none"> Effective community engagement and strong grievance mechanisms on matters related to labour
Construction Phase		
• Noise and excessive vibrations	Medium	<ul style="list-style-type: none"> Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009. The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas; Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due to commence in their vicinity; Undertake Noise and Vibration Assessments;
• Air pollution and dust generation	Medium	<ul style="list-style-type: none"> The Contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer; Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications; The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible The Contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds; Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust;
• Vegetation Cover	Low	<ul style="list-style-type: none"> Reinstatement of the project sites to their original after completion of works

Associated Impacts	Impact Levels	Management Actions
destruction		<ul style="list-style-type: none"> • All hedges damaged during construction to be reinstated after completion of the works. • The Contractor to adhere to the delineated construction work area.
• Generation of Solid waste	Medium	<ul style="list-style-type: none"> • Maximum reuse of excavated material. • Implementation of Soil erosion management in the spoil locations • Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose of appropriately. • Contractor's Camps and Construction Sites to have designated waste collection points,
• Removal of vegetation	Low	<ul style="list-style-type: none"> • The contractor to adhere to the proposed soil conservation practices. • Proper and compacted back filling. • The Contractor to stick to clear delineation of the construction to avoid vegetation loss. • Split compacted area to reduce runoff & re-vegetate where necessary. • Vehicles to be kept in designated access roads. • Minimize compaction during stockpiling by placing soil in dry state. • Any polluted soil should be handled with care for proper disposal. • Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards. • Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills. • Excavation materials to be stockpiled at the demarcated location. • Rehabilitation of the site after construction
• Water pollution	Medium	<ul style="list-style-type: none"> • Storing of fuels, oils and chemicals beneath impermeable away from surface drains • The machines to be properly serviced offsite and maintained to avoid spillage of effluents into the water bodies. • Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies. • Prompt action to be taken by the contractor in case of any pollution incident.

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> • Accidental Oil and fuel Spills and Leaks 	Medium	<ul style="list-style-type: none"> • Checking and regular servicing of Equipment. • Re-fuelling at safe locations, • Use of spill kits and applications of emergency spill procedures. • Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and shall be replaced when saturated. • Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.
<ul style="list-style-type: none"> • Loss of temporary assets and sources of livelihood 	Low	<ul style="list-style-type: none"> • No anticipated displacement was identified during social screening studies undertaken.
<ul style="list-style-type: none"> • Disruption of public utilities 	Medium	<ul style="list-style-type: none"> • Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works.
<ul style="list-style-type: none"> • Risk of accidents at work site 	Medium	<ul style="list-style-type: none"> • Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls, and helmets. Use of PPE to be enforced by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles • Isolate the site for access by the local communities during the construction for their safety and health. • Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public. • Strict use of warning signage and tapes where the trenches are open and at other active construction sites
<ul style="list-style-type: none"> • Traffic congestion 	Medium	<ul style="list-style-type: none"> • The contractor shall develop a traffic management plan; • The Contractor should provide signages or notices to indicate ongoing works;

Associated Impacts	Impact Levels	Management Actions
<ul style="list-style-type: none"> • Labour influx and sexual offences to minors 	Medium	<ul style="list-style-type: none"> • Effective community engagement and strong grievance mechanisms on matters related to labour. • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination, and equal opportunity of workers.
<ul style="list-style-type: none"> • Increased Transmission of HIV/AIDS 	Medium	<ul style="list-style-type: none"> • Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Baraza. • Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members • Ensure safety of women and girls in provision of VCT services.
<ul style="list-style-type: none"> • Human Rights Principles and Gender Inclusivity 	Medium	<ul style="list-style-type: none"> • Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. • Comply with provisions of guidelines on incorporating Human Rights Standards and Principles.
<ul style="list-style-type: none"> • Increased crime and insecurity 	Medium	<ul style="list-style-type: none"> • Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. • Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices
<ul style="list-style-type: none"> • Increased GBV 	Medium	<ul style="list-style-type: none"> • The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse • The contractor shall implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: <ul style="list-style-type: none"> - effective and on-going community engagement and consultation, particularly with women and girls;

Associated Impacts	Impact Levels	Management Actions
		<ul style="list-style-type: none"> - Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. • Ensure clear human resources policy against sexual harassment that is aligned with national law • Integrate provisions related to sexual harassment in the employee COC • Ensure appointed human resources personnel to manage reports of sexual harassment according to policy • The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. • The contractor shall ensure adequate referral mechanisms are in place if a case of GBV at the community level
<ul style="list-style-type: none"> • Sexual Exploitation and Abuse by project workers against community members 	Medium	<ul style="list-style-type: none"> • Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). • The SEA action plan shall include how the project shall ensure necessary steps are in place for: <ul style="list-style-type: none"> - Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials. - Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management. - Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights. • Management and Coordination: including integration of SEA in job descriptions, employment

Associated Impacts	Impact Levels	Management Actions
		contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.
• Child labour and protection	Low	<ul style="list-style-type: none"> The contractor shall develop and implement a Children Protection Strategy that shall ensures minors are protected against negative impacts associated by the Project including SEA. All staff of the Contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behaviour Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 Wherever possible, ensure that another adult is present when working in the proximity of children. Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger. Refrain from physical punishment or discipline of children
Operation phase		
Health and Safety Risks	Medium	<ul style="list-style-type: none"> Regular check, repair and maintenance of the water pipeline by NIWASCO officials. Activate a community watch group for information sharing on the status of the water line and sewer lines Implement a leak detection and repair program (including records of past leaks and unaccounted-for water to identify potential problem areas) Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations. Carry continuous Public Health Awareness
Decommissioning Phase		
Solid Waste Generation	Medium	<ul style="list-style-type: none"> All removed materials that shall not be used for other purposes must be removed and

Associated Impacts	Impact Levels	Management Actions
		<p>recycled/reused as far as possible;</p> <ul style="list-style-type: none"> Where recycling/reuse of the removed materials and other demolition waste is not possible; the materials should be taken to a licensed waste disposal site or arrangements made with the County Government; Donate reusable demolition waste to charitable organizations, individuals and institutions;
Noise pollution	Medium	<ul style="list-style-type: none"> Prepare a decommissioning plan to guide activities; Monitor noise levels as per the NEMA Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 & OSHA, 2007; The noise emission characteristics should be considered during selection and mobilization of decommissioning equipment; and Sensitize staff to switch off machinery and vehicles when not in use;
Occupational Health and Safety	Medium	<ul style="list-style-type: none"> Provide the correct PPE for the workers when conducting the demolition activities; Conduct training on health and safety procedures to the workers prior to commencement of demolition; Proper plans should be made prior to demolition so as to contain the raw sewage and other waste water that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it.

CHAPTER 8: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1 Introduction

An environmental management plan has been developed to assist the Proponent in mitigating and managing environmental impacts associated with the life cycle of the project. The ESMMP has been developed to provide a basis for an Environmental Management System (EMS; ISO 14001 principles) for the project. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the ESMMP. As such, the ESMMP will be subject to a regular regime of periodic review.

The ESMMP identifies management actions that need to be implemented in various phases of the proposed project life cycle as follows:

8.1.1 Planning and design phase

Refers to the stage when the feasibility studies are being undertaken, the project description is being developed and the proposed project is being designed. During this phase, the ESIA is completed and the license is applied for.

8.1.2 Construction phase

This shall commence after the proposed project license has been issued and NIWASCO has taken the decision to implement the project. The construction phase involves the development and construction of the project infrastructure.

8.1.3 Operations

This is the phase during which the proposed project shall be in operation and the targeted beneficiaries; Marimanti informal settlements shall commence benefiting from the project.

8.1.4 Decommissioning Phase

The decommissioning phase of a project includes restoring the environment to its original form once all the operational activities of the project have ceased.

The de-commissioning of the Project is not envisaged. However, some aspects of the project will require decommissioning including the Contractor's camp. Other project components including the project road will be maintained/rehabilitated over time having served their useful life.

Before decommissioning, the Contractor will prepare a decommissioning plan for the elements that will require decommissioning.

Table 8:1: Decommissioning Flow Chart

	Action	Actor
Step 1	Initiation <ul style="list-style-type: none"> • Development of an Objective Worksheet and checklist incorporating references, legal, stakeholder engagement and policies • Undertake decommissioning audit 	Proponent
Step 2	Prepare Road Map for Decommissioning Design <ul style="list-style-type: none"> • Conduct design review to validate elements of the design and ensure design features are incorporated in the decommissioning design. • Public consultations 	Proponent
Step 3	Prepare and Award Contract <ul style="list-style-type: none"> • Prepare a contract that incorporates validated project information and award to a contractor as per the Procurement rules. 	Proponent
Step 4	Execute Decommission Works <ul style="list-style-type: none"> • Implement design elements and criteria on the Project in accordance with specifications and drawings. • Inspect during decommissioning and at Project completion to ensure that all design elements are implemented according to design specifications. 	Contractor
Step 5	Non-Conformance, Corrective/Preventive Action <ul style="list-style-type: none"> • Determine root cause • Propose corrective measures • Propose future preventive measures 	Proponent

8.2 Objective of the ESMP

The objectives of the ESMP include:

- To monitor the implementation of mitigation measures against potential adverse impacts of construction and operation phases of the project to ensure that they conform and comply with relevant environmental and social policies, guidelines and legislation
- To assess emerging non-anticipated adverse environmental and social impacts and implement relevant mitigation measures to maintain them within acceptable levels
- To maintain best practice in environmental, social health and safety during project construction and operation
- To address capacity building needs within KISIP 2, Supervision Consultant, Contractor and the Ministry of Transport and Infrastructure, where necessary

8.3 Responsibilities for the Environmental and Social Management Plan

In order to ensure sound development and effective implementation of the ESMMP, it shall be necessary to identify and define the responsibilities and authority of the various persons and Organizations which shall be involved in the project. The following entities should be involved in the implementation of this ESMMP.

Table 8:2: Responsibilities for Environmental and Social Management

No	Institution	Responsibility of ESMP
1.	State Department of Housing and Urban Development, Ministry of Lands, Public Works, Housing and Urban Development Second Kenya Informal Settlements Improvement Project (KISIP 2)	<ul style="list-style-type: none"> Provide Policy Guidelines Enforce regulations and standards to ensure safe, secure and efficient transport and infrastructure systems.
2.	KISIP 2 National team	<ul style="list-style-type: none"> Overall supervision of Project ESMP. Carry out monthly site safeguards inspection to determine compliance. Oversee internal and External Monitoring of ESMP. Receive and evaluate Supervising Consultant and Contractor safeguards Reports.
3.	County of Tharaka Nithi	<ul style="list-style-type: none"> Ensure contractor complies with requirements of the ESMP Coordinate activities in consultation with KISIP 2 National team.
4.	Contractor <ul style="list-style-type: none"> Environmental Specialist Social Specialist Registered OHS Expert 	<ul style="list-style-type: none"> Construction of the proposed interventions while protecting the community and the environment. Execution of the ESMP Ensuring compliance with ESMP.
5.	Supervising Consultant <ul style="list-style-type: none"> The Resident Engineer Environmental Safeguards Specialist Social Safeguards Specialist 	<ul style="list-style-type: none"> Daily supervision and monitoring of compliance with ESMP by Contractor. Daily supervision and Monitoring of OHS compliance by Contractor. Preparation of monthly Reports on ESMPs compliance by Contractor and any incidences with regards to construction activities.
6.	National Environment Management Authority (NEMA)	<ul style="list-style-type: none"> Exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of the Government of Kenya in the implementation of all policies relating to the

No	Institution	Responsibility of ESMP
		environment.

DISCLOSURE COPY

8.4 Environmental Social Management and Monitoring Plan

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts for the proposed project in Marimanti is provided below for the;

- (i) Pre-construction Stage
- (ii) Construction stage,
- (iii) Operational stage, and
- (iv) Decommissioning stage respectively.

8.4.1 Environmental and Social Management and Monitoring Plan (ESMMP) Roads Component

Table 8:3: Pre-Construction Phase ESMMP roads

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
Environmental Impact					
Temporary land interference	<ul style="list-style-type: none"> Notify community members Reinstatement to be done after completion of the project Mark project area to avoid conflicts with other activities 	<ul style="list-style-type: none"> Land degradations Un-reinstated land 	Daily	Contractor	<ul style="list-style-type: none"> 83,400
Social impact					
Labour influx	<ul style="list-style-type: none"> Effective community engagement and strong grievance mechanisms on matters related to labour 	<ul style="list-style-type: none"> Number of grievances logged on site. Records of local and non-local workers 	Daily	Contractor	Contractor to cover in his costs

Table 8:4: Construction ESMMP Roads

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
Environmental					
• Noise and excessive vibrations	<ul style="list-style-type: none"> • Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009. • The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas; • Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due 	<ul style="list-style-type: none"> • Number of complaints received from neighbouring residents 	Daily	Contractor	16,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>to commence in their vicinity;</p> <ul style="list-style-type: none"> Undertake Noise and Vibration Assessments; 				
• Air pollution and dust generation	<ul style="list-style-type: none"> The contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer; Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications; The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as 	<ul style="list-style-type: none"> Cases of respiratory complication at nearby health center Visible dust in project site 	Daily	Contractor	16,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>soon as practically possible</p> <ul style="list-style-type: none"> The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds; Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust; 				
• Vegetation Cover destruction	<ul style="list-style-type: none"> Reinstatement of the project sites to their original after completion of civil and road works All hedges damaged during construction to be reinstated after completion of the Works The contractor to adhere to the delineated construction work area. 	<ul style="list-style-type: none"> Number of trees cut Number of hedges affected 	Weekly	Contractor	166,700

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Planting of grass along the way leave and Pipeline friendly tree to be grown after construction 				
• Generation of Solid waste	<ul style="list-style-type: none"> Maximum reuse of excavated material. Implementation of Soil erosion management in the spoil locations Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately Contractor's Camps and Construction Sites to have designated waste collection points, 	<ul style="list-style-type: none"> Waste tracking documentation Number of complaints from community not happy with waste of spoil material 	Daily	Contractor	166,700

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
<ul style="list-style-type: none"> Impacts on soil 	<ul style="list-style-type: none"> The contractor to adhere to the proposed soil conservation practices. Proper and compacted back filling. The contractor to stick to clear delineation of the construction to avoid vegetation loss. Planting of vegetation cover along the pipeline way leave Split compacted area to reduce runoff & re-vegetate where necessary Vehicles to be kept in designated access roads. Minimize compaction during stockpiling by placing soil in dry state Any polluted soil should be handled with care for proper disposal. Concrete mixing shall be done on concrete slabs or a large metal sheet or 	<ul style="list-style-type: none"> Presence of pollutants in soil Visible oil spillage on soil 	Daily	Contractor	166,700

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	mortar boards <ul style="list-style-type: none"> Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills. Excavation materials to be stock piled at the demarcated location. Rehabilitation of the site after construction 				
• Impact on water	<ul style="list-style-type: none"> Storing of fuels, oils and chemicals beneath impermeable away from surface drains The machines to be properly serviced offsite and maintained to avoid spillage of effluents into the water bodies Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water 	<ul style="list-style-type: none"> Levels of effluents in water bodies No of complaints received in regard to water pollution and reduced water supply 	Monthly	Contractor	83,400

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>bodies.</p> <ul style="list-style-type: none"> • Prompt action to be taken by the contractor in case of any pollution incident. • Grey water to be contained and properly channeled. • Onsite treatment of grey water by the facility approved by the resident engineer. 				
• Accidental Oil and fuel Spills and Leaks	<ul style="list-style-type: none"> • Checking and regular servicing of Equipment. • Re-fuelling at safe locations, • Use of spill kits and applications of emergency spill procedures. • Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and shall be replaced when saturated. 	<ul style="list-style-type: none"> • Presence of oil spillages 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • 10,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used. 				
<ul style="list-style-type: none"> Loss of temporary assets and sources of livelihood 	<ul style="list-style-type: none"> No anticipated displacement was identified during social screening studies undertaken during the ESIA Any displacement that may be identified during construction to be dealt with on case by case basis 	<ul style="list-style-type: none"> No of complaints received in regards to loss of livelihood 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> No RAP 83400
<ul style="list-style-type: none"> Disruption of public utilities 	<ul style="list-style-type: none"> Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works. Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time 	<ul style="list-style-type: none"> Number of public utilities damaged Number of complaints from community due to lack of certain services 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> 166,700

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> of disruption of services. Consultation and liaison with the various service providers shall be undertaken throughout the project life. 				
<ul style="list-style-type: none"> Labour influx and sexual offences to minors 	<ul style="list-style-type: none"> Effective community engagement and strong grievance mechanisms on matters related to labour. Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx Proper records of labour force on site while avoiding child and forced labour Fair treatment, non-discrimination, and equal opportunity of workers. 	<ul style="list-style-type: none"> Number of locals recruited Records of workers on site 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Contractor to cover in his cost
<ul style="list-style-type: none"> Increased Transmission of HIV/AIDS 	<ul style="list-style-type: none"> Sensitize workers and the surrounding communities on awareness, 	<ul style="list-style-type: none"> Number of cases of diseases reported No of workers trained on HIV/ 	Weekly	Contractor	83,400

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Barazas.</p> <ul style="list-style-type: none"> • Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members • Ensure safety of women and girls in provision of VCT services. 	<p>AIDS</p> <ul style="list-style-type: none"> • Number of gender-disaggregated toilets constructed 			
• Human Rights Principles and Gender Inclusivity	• Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule.	• Records of women recruited	Weekly	Contractor	No additional cost

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Comply to provisions of guidelines on incorporating Human Rights Standards and Principles, including Gender, in Programme Proposals for Bilateral German Technical and Financial Cooperation 				
<ul style="list-style-type: none"> Increased crime and insecurity 	<ul style="list-style-type: none"> Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices 	<ul style="list-style-type: none"> No of crime related incidences reported in regard to the project 	Daily	Contractor	Contractor to add in his cost
<ul style="list-style-type: none"> Increased GBV 	<ul style="list-style-type: none"> The Contractor shall require his employees, sub-contractors, sub- 	<ul style="list-style-type: none"> Mitigation plan for GBV occurring at the community 	Daily	Contractor County Government	83,400

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse</p> <ul style="list-style-type: none"> • The contractor shall implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: <ul style="list-style-type: none"> - Effective and on-going community engagement and consultation, particularly with women and girls; - Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation 	<p>level as a result of project implementation</p> <ul style="list-style-type: none"> • Number of GBV cases happening at the community level that receive survivor-centered referral and care • GBV trainings 			

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>schemes; employment schemes for women; etc.</p> <ul style="list-style-type: none"> • Ensure clear human resources policy against sexual harassment that is aligned with national law • Integrate provisions related to sexual harassment in the employee COC • Ensure appointed human resources personnel to manage reports of sexual harassment according to policy • The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. • The contractor shall ensure adequate referral mechanisms are in place 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	if a case of GBV at the community level				
• Sexual Exploitation and Abuse by project workers against community members	<ul style="list-style-type: none"> • Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). • The SEA action plan shall include how the project shall ensure necessary steps are in place for: <ul style="list-style-type: none"> ❖ Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non- 	<ul style="list-style-type: none"> • SEA Action Plan • Code of Conduct • Number of staff trainings • SEA FP • Community Liaison trained in PSEA • IEC materials for worker's sites and community • Discrete SEA reporting pathway • Relevant policies, e.g. investigations and discipline and whistle-blower protection • Monthly minutes from SEA coordination meetings 	Daily	<ul style="list-style-type: none"> • Contractor • County Government 	<ul style="list-style-type: none"> • Covered under GBV

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>compliance; project-level IEC materials;</p> <ul style="list-style-type: none"> ❖ Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management; ❖ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights;</p> <ul style="list-style-type: none"> • Management and Coordination: including integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.				
• Child labour and protection	<ul style="list-style-type: none"> • The contractor shall develop and implement a Children Protection Strategy that shall ensures minors are protected against negative impacts associated by the Project including SEA. • All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior • Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 	<ul style="list-style-type: none"> • Availability of child protection strategy • Signed CoC • Identification cards for all workers 	Daily	Contractor	Covered under GBV

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Wherever possible, ensure that another adult is present when working in the proximity of children. Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger. Refrain from physical punishment or discipline of children 				
Conflicts between Contractor and Community	<ul style="list-style-type: none"> Establishment of a formal grievance and redress mechanism by the supervising consultant/Engineer; The Contractor shall be required to minimize the possibility of occurrence of grievances with the local community; The contractor shall maintain a Complaints Register on site detailing 	<ul style="list-style-type: none"> Number of grievances lodged 	Daily	Contractor, SEC&GRC	83400

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken.</p> <ul style="list-style-type: none"> Copies of received complaints shall be copied to the supervising consultant/Engineer and issues to be addressed accordingly. 				
Project Intervention Priority Conflicts	<ul style="list-style-type: none"> Continuous community engagement and participation Establishment of a formal grievance and redress mechanism Maintaining a complaints register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken. 	<ul style="list-style-type: none"> Number of grievances received 	Daily	<ul style="list-style-type: none"> National and County Government 	<ul style="list-style-type: none"> No additional costs

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	whom, any follow up action taken.				
• Risk of accidents at work site	<ul style="list-style-type: none"> Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer. The plan shall comprehensively analyze all potential safety and health risks and provide corresponding prevention measures, including emergency response plan. All workers to be inducted and trained on specific safety measures regularly throughout the construction period. As applicable, works including operating equipment and electromechanical installations shall be 	<ul style="list-style-type: none"> Availability of incidences Occurrence book on site No of complains from workers for lacking water or sanitation facilities 	Daily	Contractor	PPEs -333,350 Facilities -83,400 Trainings -100,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>performed only by duly qualified personnel.</p> <ul style="list-style-type: none"> Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer. Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles Isolate the site for access by the local communities during the construction for their safety and health Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public. Strict use of warning signage and tapes where 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	the trenches are open and at other active construction sites				
• Traffic congestion	<ul style="list-style-type: none"> • The contractor shall develop a traffic management plan; • The Contractor should provide temporary road signs or notices to indicate ongoing works; • The Contractor together with the Resident Engineer should Plan itineraries for site traffic on a daily basis and avoid peak traffic periods; 	<ul style="list-style-type: none"> • Erected traffic related signage's • No of complaints raised by road users • Availability of traffic management plan 	Daily	Contractor	200,000

Table 8:5: Operational ESMMP Roads

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Target Areas& Responsibilities
Negative Impacts				
Environmental				
Pollution of water and soils	<ul style="list-style-type: none"> Blockages should be detected and promptly replaced; County Government to attend to blocked drainages promptly to prevent excessive loss of soil through erosion; Provide high risk areas with appropriate drainage for effective channeling of burst sewage spills; 	Number of visible blocked drainages	Daily	All work areas <u>Responsibility</u> County Government of Tharaka Nithi
Visual and landscape impact management	<ul style="list-style-type: none"> Elaborate landscaping and maintenance of these sites can limit the viewpoints to the facilities and thus reduce their visual impact. 	Number of unin reinstated land Land degradation	Daily	All work areas <u>Responsibility</u> County Government of Tharaka Nithi
Social				
Risk of encroachment and construction of structures on the way leave	<ul style="list-style-type: none"> Arrest and prosecution of encroachers as required by Tharaka Nithi County Bylaws on Way Leaves and Road Reserves 	<ul style="list-style-type: none"> Number of structures constructed 	Weekly	All work areas <u>Responsibility</u> County Government
Occupation Health And Safety Risks				

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Target Areas& Responsibilities
Health and safety risks	<ul style="list-style-type: none"> Regular check, repair and maintenance of the road Activate a community watch group for information sharing on the status of the roads appurtenances Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations. Carry continuous Public Health Awareness 	<ul style="list-style-type: none"> Number of accidents and incidents Presence of blocked chambers 	Daily	County Government of Tharaka Nithi

Table 8:6: Decommissioning ESMMP Roads

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Responsibilities
Negative impacts				
Environmental				
Solid Waste Generation	<ul style="list-style-type: none"> All removed materials that shall not be used for other purposes must be removed and recycled/reused as far as possible; Where recycling/reuse of the removed materials and other demolition waste is not possible; the materials should be taken to a licensed waste disposal site or arrangements made with the County Government; Donate reusable demolition waste to charitable organizations, individuals and institutions; 	Presence of solid waste in the environment	Daily	Contractor
Noise pollution	<ul style="list-style-type: none"> Prepare a decommissioning plan to guide activities; Monitor noise levels as per the NEMA Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 & OSHA, 2007; The noise emission characteristics should be considered during selection and mobilization of decommissioning equipment; and Sensitize staff to switch off machinery and vehicles when not in use; 	<ul style="list-style-type: none"> Levels of noise produced Number of complaints recorded 	Daily	Contractor
Occupational Health and Safety Impacts				
Occupational Health and Safety	<ul style="list-style-type: none"> Provide the correct PPE for the workers when conducting the demolition activities; 	<ul style="list-style-type: none"> Records of accidents and 	Daily	Contractor

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Responsibilities
	<ul style="list-style-type: none"> Conduct training on health and safety procedures to the workers prior to commencement of demolition; Proper plans should be made prior to demolition so as to contain the raw sewage and other waste water that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it. 	incidents		

8.4.2 Environmental and Social Management and Monitoring Plan (ESMMP) Water Component

Table 8:7: Preconstruction ESMMP Water

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
Environmental Impact					
Temporary land interference	<ul style="list-style-type: none"> Notify community members. Reinstatement to be done after completion of the project. Mark project is to avoid conflicts with other activities 	<ul style="list-style-type: none"> Land degradation Presence of unreinstated land 	Daily	Contractor	83,400
Social impact					
Labour influx	<ul style="list-style-type: none"> Effective community engagement and strong grievance mechanisms on matters related to labour. 	Employees records Number of local workers engaged	Daily	Contractor	Contractor to cover in his costs

Table 8:8: Construction ESMMP Water

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
Environmental					
• Noise and excessive vibrations	<ul style="list-style-type: none"> • Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009. • The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas; • Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days before construction is due 	• Number of complaints received from neighbouring residents	Daily	Contractor	16,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>to commence in their vicinity;</p> <ul style="list-style-type: none"> Undertake Noise and Vibration Assessments; 				
• Air pollution and dust generation	<ul style="list-style-type: none"> The contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer; Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications; The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically 	<ul style="list-style-type: none"> Cases of respiratory complication at nearby health center Visible dust in project site 	Daily	Contractor	16,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>possible</p> <ul style="list-style-type: none"> • The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds; • Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust; 				
• Vegetation Cover destruction	<ul style="list-style-type: none"> • Reinstatement of the project sites to their original after completion of civil and road works • All hedges damaged during construction to be reinstated after completion of the Works • The contractor to adhere to the delineated construction work area. • Planting of grass along the way leave and Pipeline 	<ul style="list-style-type: none"> • Number of trees cut • Number of hedges affected 	Weekly	Contractor	166,700

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	friendly tree to be grown after construction				
• Generation of Solid waste	<ul style="list-style-type: none"> • Maximum reuse of excavated material. • Implementation of Soil erosion management in the spoil locations • Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately • Contractor's Camps and Construction Sites to have designated waste collection points, 	<ul style="list-style-type: none"> • Waste tracking documentation • Number of complaints from community not happy with waste management of spoil material 	Daily	Contractor	166,700
• Impacts on soil	<ul style="list-style-type: none"> • The contractor to adhere to the proposed soil conservation practices. • Proper and compacted back filling. • The contractor to stick to clear delineation of the construction to avoid vegetation loss. 	<ul style="list-style-type: none"> • Presence of pollutants in soil • Visible oil spillage on soil 	Daily	Contractor	166,700

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Planting of vegetation cover along the pipeline way leave Split compacted area to reduce runoff & re-vegetate where necessary Vehicles to be kept in designated access roads. Minimize compaction during stockpiling by placing soil in dry state Any polluted soil should be handled with care for proper disposal. Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills. Excavation materials to be stock piled at the demarcated location. 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Rehabilitation of the site after construction 				
• Impact on water	<ul style="list-style-type: none"> Storing of fuels, oils and chemicals beneath impermeable away from surface drains The machines to be properly serviced offsite and maintained to avoid spillage of effluents into the water bodies Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies. Prompt action to be taken by the contractor in case of any pollution incident. 	<ul style="list-style-type: none"> Levels of effluents in water bodies No of complaints received in regard to water pollution and reduced water supply 	Monthly	Contractor	83,400

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> • Grey water to be contained and properly channeled. • Onsite treatment of grey water by the facility approved by the resident engineer. 				
• Accidental Oil and fuel Spills and Leaks	<ul style="list-style-type: none"> • Checking and regular servicing of Equipment. • Re-fuelling at safe locations, • Use of spill kits and applications of emergency spill procedures. • Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and shall be replaced when saturated. • Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be 	<ul style="list-style-type: none"> • Presence of oil spillages 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • 10,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	used.				
<ul style="list-style-type: none"> • Loss of temporary assets and sources of livelihood 	<ul style="list-style-type: none"> • No anticipated displacement was identified during social screening studies undertaken during the ESIA • Any displacement that may be identified during construction to be dealt with on case by case basis 	<ul style="list-style-type: none"> • No of complaints received in regards to loss of livelihood 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> No RAP • 83400
<ul style="list-style-type: none"> • Disruption of public utilities 	<ul style="list-style-type: none"> • Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works. • Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services. • Consultation and liaison with the various service 	<ul style="list-style-type: none"> • Number of public utilities damaged • Number of complaints from community due to lack of certain services 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • 166,700

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	providers shall be undertaken throughout the project life.				
<ul style="list-style-type: none"> • Labour influx and sexual offences to minors 	<ul style="list-style-type: none"> • Effective community engagement and strong grievance mechanisms on matters related to labour. • Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx • Proper records of labour force on site while avoiding child and forced labour • Fair treatment, non-discrimination, and equal opportunity of workers. 	<ul style="list-style-type: none"> • Number of locals recruited • Records of workers on site 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • Contractor to cover in his cost
<ul style="list-style-type: none"> • Increased Transmission of HIV/AIDS 	<ul style="list-style-type: none"> • Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights 	<ul style="list-style-type: none"> • Number of cases of diseases reported • No of workers trained on HIV/AIDS • Number of gender-disaggregated 	Weekly	Contractor	83,400

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>through staff training, awareness campaigns, multimedia and workshops or during community Barazas.</p> <ul style="list-style-type: none"> • Use existing clinics to provide VCT services to construction crew and provision of ARVs for vulnerable community members • Ensure safety of women and girls in provision of VCT services. 	toilets constructed			
• Human Rights Principles and Gender Inclusivity	<ul style="list-style-type: none"> • Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. • Comply to provisions of guidelines on incorporating Human Rights Standards and Principles, including 	<ul style="list-style-type: none"> • Records of women recruited 	Weekly	Contractor	No additional cost

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	Gender, in Programme Proposals for Bilateral German Technical and Financial Cooperation				
• Increased crime and insecurity	<ul style="list-style-type: none"> Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to address any security and crime arising during project implementation. Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices 	<ul style="list-style-type: none"> No of crime related incidences reported in regard to the project 	Daily	Contractor	Contractor to add in his cost
• Increased GBV	<ul style="list-style-type: none"> The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific 	<ul style="list-style-type: none"> Mitigation plan for GBV occurring at the community level as a result of project implementation Number of GBV cases happening at the community 	Daily	Contractor County Government	83,400

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>provisions on protection from sexual exploitation and abuse</p> <ul style="list-style-type: none"> • The contractor shall implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: <ul style="list-style-type: none"> - Effective and on-going community engagement and consultation, particularly with women and girls; - Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. • Ensure clear human resources policy against sexual harassment that is aligned with national law • Integrate provisions 	<p>level that receive survivor-centered referral and care</p> <ul style="list-style-type: none"> • GBV trainings 			

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>related to sexual harassment in the employee COC</p> <ul style="list-style-type: none"> • Ensure appointed human resources personnel to manage reports of sexual harassment according to policy • The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. • The contractor shall ensure adequate referral mechanisms are in place if a case of GBV at the community level 				
• Sexual Exploitation and Abuse by project workers against community members	<ul style="list-style-type: none"> • Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan shall 	<ul style="list-style-type: none"> • SEA Action Plan • Code of Conduct • Number of staff trainings • SEA FP 	Daily	<ul style="list-style-type: none"> • Contractor • County Government 	<ul style="list-style-type: none"> • Covered under GBV

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).</p> <ul style="list-style-type: none"> • The SEA action plan shall include how the project shall ensure necessary steps are in place for: <ul style="list-style-type: none"> ❖ Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials; ❖ Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating 	<ul style="list-style-type: none"> • Community Liaison trained in PSEA • IEC materials for worker's sites and community • Discrete SEA reporting pathway • Relevant policies, e.g. investigations and discipline and whistle-blower protection • Monthly minutes from SEA coordination meetings 			

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management;</p> <ul style="list-style-type: none"> ❖ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights; • Management and Coordination: including 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.				
• Child labour and protection	• The contractor shall develop and implement a Children Protection Strategy that shall ensures minors are	• Availability of child protection strategy • Signed CoC • Identification cards for all workers	Daily	Contractor	Covered under GBV

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>protected against negative impacts associated by the Project including SEA.</p> <ul style="list-style-type: none"> • All staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior • Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 • Wherever possible, ensure that another adult is present when working in the proximity of children. • Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger. • Refrain from physical punishment or discipline 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	of children				
Conflicts between Contractor and Community	<ul style="list-style-type: none"> Establishment of a formal grievance and redress mechanism by the supervising consultant/Engineer; The Contractor shall be required to minimize the possibility of occurrence of grievances with the local community; The contractor shall maintain a Complaints Register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken. Copies of received complaints shall be copied to the supervising consultant/Engineer and 	<ul style="list-style-type: none"> Number of grievances lodged 	Daily	Contractor, SEC&GRC	83400

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	issues to be addressed accordingly.				
Project Intervention Priority Conflicts	<ul style="list-style-type: none"> Continuous community engagement and participation Establishment of a formal grievance and redress mechanism Maintaining a complaints register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken. 	<ul style="list-style-type: none"> Number of grievances received 	Daily	<ul style="list-style-type: none"> National and County Government 	<ul style="list-style-type: none"> No additional costs
• Risk of accidents at work site	<ul style="list-style-type: none"> Contractor to provide a Healthy and Safety Plan prior to the commencement of works to be approved by the Supervising Engineer. The plan shall comprehensively analyze all potential safety and 	<ul style="list-style-type: none"> Availability of incidences Occurrence book on site No of complains from workers for lacking water or sanitation facilities 	Daily	Contractor	PPEs -333,350 Facilities -83,400 Trainings -100,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>health risks and provide corresponding prevention measures, including emergency response plan.</p> <ul style="list-style-type: none"> • All workers to be inducted and trained on specific safety measures regularly throughout the construction period. • As applicable, works including operating equipment and electromechanical installations shall be performed only by duly qualified personnel. • Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer. • Fully stocked First Aid Kits to be provided within the 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>Sites, Camps and in all Project Vehicles</p> <ul style="list-style-type: none"> • Isolate the site for access by the local communities during the construction for their safety and health • Camps and Work Sites to be fenced off and Security Guards provided to restrict access to members of the public. • Strict use of warning signage and tapes where the trenches are open and at other active construction sites 				
• Traffic congestion	<ul style="list-style-type: none"> • The contractor shall develop a traffic management plan; • The Contractor should provide temporary road signs or notices to indicate ongoing works; • The Contractor together with the Resident Engineer should Plan itineraries for site traffic 	<ul style="list-style-type: none"> • Erected traffic related signage's • No of complaints raised by road users • Availability of traffic management plan 	Daily	Contractor	200,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	on a daily basis and avoid peak traffic periods;				

Table 8:9: Operational ESMP Water

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Target Areas& Responsibilities
Negative Impacts				
Environmental				
Pollution of water and soils	<ul style="list-style-type: none"> Blockages should be detected and promptly replaced; NIWASCO to attend to burst pipes promptly to prevent excessive loss of soil; Provide high risk areas with appropriate drainage for effective channeling of burst sewage spills; Mark clearly the pipeline for ease of identification and protection by the adjacent landowners 	Number of bursts Visible blocked drainages	Daily	All work areas <u>Responsibility</u> County Government of Tharaka Nithi
Increased domestic wastewater generation	<ul style="list-style-type: none"> The client to consider ensure all household are connected to the new reticulations. 	Visible grey water in the environment	Daily	All work areas <u>Responsibility</u> NIWASCO
Visual and landscape impact management	<ul style="list-style-type: none"> Elaborate landscaping and maintenance of these sites can limit the viewpoints to the facilities and thus reduce their visual impact. 			All work areas <u>Responsibility</u> County Government of Tharaka Nithi
Risk of water pipeline bursts leading to water	<ul style="list-style-type: none"> Regular check, repair and maintenance of the water pipeline Activate a community watch group for 	<ul style="list-style-type: none"> Number of bursts and leakages 	Daily	Water pipeline routes <u>Responsibility</u>

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Target Areas& Responsibilities
wastage	<p>information sharing on the status of the water line</p> <ul style="list-style-type: none"> • Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas) • The risk of pipeline bursts is low as the pipeline design, including the selection of pipe material and pipe pressure classes, has been carried out so as to minimize this risk. • This risk shall be further minimized through regular inspection, repair and maintenance of the pipeline by the Operator, NIWASCO 			NIWASCO
Social				
Risk of illegal connection and vandalism of the water Pipeline	<ul style="list-style-type: none"> • This shall require constant inspection by NIWASCO officials and installation of leak and burst detectors at designated areas along the pipeline. • Conduct public sensitization programs on importance not interfering with the water pipeline and the need to seek official water connection from NIWASCO 	<ul style="list-style-type: none"> • Number of vandalized infrastructures • Records of reported cases 	<p>Daily</p>	<p>All work areas</p> <p><u>Responsibility</u> NIWASCO</p>

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Target Areas& Responsibilities
Risk of encroachment and construction of structures on the pipeline way leave	<ul style="list-style-type: none"> • Arrest and prosecution of encroachers as required by Tharaka Nithi • County Bylaws on Way Leaves and Road Reserves • NIWASCO to undertake awareness campaigns aimed at preventing encroachment 	<ul style="list-style-type: none"> • Number of structures constructed 	Weekly	All work areas <u>Responsibility</u> NIWASCO
Occupation Health And Safety Risks				
Health and safety risks	<ul style="list-style-type: none"> • Regular check, repair and maintenance of the water pipeline and sewer lines by NIWASCO officials. • Activate a community watch group for information sharing on the status of the water line and sewer lines. • Implement a leak detection and repair program (including records of past leaks and unaccounted- for water to identify potential problem areas) • Awareness rising among community members not to dump solids in manholes. • Development of an inventory of system components, with information including age, construction materials, and drainage areas served elevations. • Carry continuous Public Health 	<ul style="list-style-type: none"> • Number of accidents and incidents • Presence of waste in chambers 	Daily	NIWASCO County Government of Tharaka Nithi

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Target Areas& Responsibilities
	Awareness			

Table 8:10: Decommissioning ESMP Water

Potential Impacts	Management Actions	MONITORING Indicators	Monitoring frequency	Responsibilities
Negative impacts				
Environmental				
Solid Waste Generation	<ul style="list-style-type: none"> All removed materials that shall not be used for other purposes must be removed and recycled/reused as far as possible; Where recycling/reuse of the removed materials and other demolition waste is not possible; the materials should be taken to a licensed waste disposal site or arrangements made with the County Government; Donate reusable demolition waste to charitable organizations, individuals and institutions; 	Presence of solid waste in the environment	Daily	Contractor
Noise pollution	<ul style="list-style-type: none"> Prepare a decommissioning plan to guide activities; Monitor noise levels as per the NEMA Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 & OSHA, 2007; The noise emission characteristics should be considered during selection and mobilization of decommissioning equipment; and Sensitize staff to switch off machinery and vehicles when not in use; 	<ul style="list-style-type: none"> Levels of noise produced Number of complaints recorded 	Daily	Contractor
Occupational Health and Safety Impacts				
Occupational Health and Safety	<ul style="list-style-type: none"> Provide the correct PPE for the workers when conducting the demolition activities; Conduct training on health and safety procedures to the 	<ul style="list-style-type: none"> Records of accidents and 	Daily	Contractor

Potential Impacts	Management Actions	MONITORING Indicators	Monitoring frequency	Responsibilities
	<ul style="list-style-type: none"> workers prior to commencement of demolition; Proper plans should be made prior to demolition so as to contain the raw sewage and other waste water that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it. 	incidents		

8.4.3 Environmental and Social Management and Monitoring Plan (ESMMP) Ablution Block

Table 8:11: Preconstruction ESMMP Ablution Block

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
Environmental Impact					
Temporary land interference	<ul style="list-style-type: none"> Notify community members. Reinstatement to be done after completion of the project. Mark project is to avoid conflicts with other activities 	<ul style="list-style-type: none"> Land degradation Presence of unreinstated land 	Daily	Contractor	83200
Social impact					
Labour influx	<ul style="list-style-type: none"> Effective community engagement and strong grievance mechanisms on matters related to labour. 	Employees records Number of local workers engaged	Daily	Contractor	Contractor to cover in his cost

Table 8:12: Construction ESMMP Ablution Block

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
Environmental					
• Noise and excessive vibrations	<ul style="list-style-type: none"> • Contractor shall comply with provisions of EMCA (Noise and Excessive Vibrations) Regulations of 2009. • The Contractor shall keep noise level within acceptable limits (60dBA for sensitive locations (residential, educational, health institutions etc.) and 75 dBA for other areas during the day Decibels during the night) and construction activities shall, where possible, be confined to normal working hours in the residential areas; • Hospitals and other noise sensitive areas such as schools and residential shall be notified by the Contractor at least 5 days 	• No of complaints received from neighbouring residents	Daily	Contractor	16,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>before construction is due to commence in their vicinity;</p> <ul style="list-style-type: none"> Undertake Noise and Vibration Assessments; 				
• Air pollution and dust generation	<ul style="list-style-type: none"> The contractor to comply the provisions of EMCA (Air Quality Regulations) 2014, to be enforced by the Supervising Engineer; Workers shall be trained on management of air pollution from vehicles and machinery. All construction machinery shall be maintained and serviced in accordance with the manufacturers' specifications; The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically 	<ul style="list-style-type: none"> Cases of respiratory complication at nearby health centre Visible dust in project site 	Daily	Contractor	16,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>possible</p> <ul style="list-style-type: none"> • The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds; • Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust; 				
• Vegetation Cover destruction	<ul style="list-style-type: none"> • Reinstatement of the project sites to their original after completion of civil and road works • All hedges damaged during construction to be reinstated after completion of the Works • The contractor to adhere to the delineated construction work area. • Planting of grass along the way leave and Pipeline 	<ul style="list-style-type: none"> • Number of trees cut • Number of hedges affected 	Weekly	Contractor	166,600

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	friendly tree to be grown after construction				
• Generation of Solid waste	<ul style="list-style-type: none"> • Maximum reuse of excavated material. • Implementation of Soil erosion management in the spoil locations • Construction wastes (residual earth, debris and scrap materials) to be collected at designated points and Contractor to dispose to appropriately • Contractor's Camps and Construction Sites to have designated waste collection points, 	<ul style="list-style-type: none"> • Waste tracking documentation • Number of complaints from community not happy with waste management of spoil material 	Daily	Contractor	166,600
• Impacts on soil	<ul style="list-style-type: none"> • The contractor to adhere to the proposed soil conservation practices. • Proper and compacted back filling. • The contractor to stick to clear delineation of the construction to avoid vegetation loss. 	<ul style="list-style-type: none"> • Presence of pollutants in soil • Visible oil spillage on soil 	Daily	Contractor	166,600

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Planting of vegetation cover along the pipeline way leave Split compacted area to reduce runoff & re-vegetate where necessary Vehicles to be kept in designated access roads. Minimize compaction during stockpiling by placing soil in dry state Any polluted soil should be handled with care for proper disposal. Concrete mixing shall be done on concrete slabs or a large metal sheet or mortar boards Maintenance of vehicles to be done strictly at designated place/Drip trays to be used to avoid oil spills. Excavation materials to be stock piled at the demarcated location. 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Rehabilitation of the site after construction 				
• Impact on water	<ul style="list-style-type: none"> Storing of fuels, oils and chemicals beneath impermeable away from surface drains The machines to be properly serviced offsite and maintained to avoid spillage of effluents into the water bodies Water containing pollutants should be kept in a conservancy tank for removal to prevent pollution of the surface water and surface water bodies. Prompt action to be taken by the contractor in case of any pollution incident. 	<ul style="list-style-type: none"> Levels of effluents in water bodies No of complaints received in regard to water pollution and reduced water supply 	Monthly	Contractor	83,200

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
<ul style="list-style-type: none"> • Accidental Oil and fuel Spills and Leaks 	<ul style="list-style-type: none"> • Checking and regular servicing of Equipment. • Re-fuelling at safe locations, • Use of spill kits and applications of emergency spill procedures. • Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and shall be replaced when saturated. • Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used. 	<ul style="list-style-type: none"> • Presence of oil spillages 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • 10,000
<ul style="list-style-type: none"> • Loss of temporary assets and sources of livelihood 	<ul style="list-style-type: none"> • No anticipated displacement was identified during social screening studies undertaken during the ESIA 	<ul style="list-style-type: none"> • No of complaints received in regards to loss of livelihood 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> No RAP • 83200

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> Any displacement that may be identified during construction to be dealt with on case by case basis 				
<ul style="list-style-type: none"> Disruption of public utilities 	<ul style="list-style-type: none"> Contractor to carry out piloting to locate services such as pipes and cables along the Pipeline Route before commencing excavation works. Length of excavation to be restricted to sections that can be reinstated within the shortest period possible to minimize time of disruption of services. Consultation and liaison with the various service providers shall be undertaken throughout the project life. 	<ul style="list-style-type: none"> Number of public utilities damaged Number of complaints from community due to lack of certain services 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> 166,600
<ul style="list-style-type: none"> Labour influx and sexual offences to minors 	<ul style="list-style-type: none"> Effective community engagement and strong grievance mechanisms on matters related to labour. Effective contractual 	<ul style="list-style-type: none"> Number of locals recruited Records of workers on site 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Contractor to cover in his cost

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>obligations for the contractor to adhere to the mitigation of risks against labour influx</p> <ul style="list-style-type: none"> Proper records of labour force on site while avoiding child and forced labour Fair treatment, non-discrimination, and equal opportunity of workers. 				
• Increased Transmission of HIV/AIDS	<ul style="list-style-type: none"> Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS and sexual health and rights through staff training, awareness campaigns, multimedia and workshops or during community Barazas. Use existing clinics to provide VCT services 	<ul style="list-style-type: none"> Number of cases of diseases reported No of workers trained on HIV/AIDS Number of gender-disaggregated toilets constructed 	Weekly	Contractor	83,200

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> to construction crew and provision of ARVs for vulnerable community members • Ensure safety of women and girls in provision of VCT services. 				
• Human Rights Principles and Gender Inclusivity	<ul style="list-style-type: none"> • Mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. • Comply to provisions of guidelines on incorporating Human Rights Standards and Principles, including Gender, in Programme Proposals for Bilateral German Technical and Financial Cooperation 	<ul style="list-style-type: none"> • Records of women recruited 	Weekly	Contractor	No additional cost
• Increased crime and insecurity	<ul style="list-style-type: none"> • Contractor and Supervision Team to liaise regularly with the Local Administration and Police 	<ul style="list-style-type: none"> • No of crime related incidences reported in regard to the project 	Daily	Contractor	Contractor to add in his cost

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>Service to address any security and crime arising during project implementation.</p> <ul style="list-style-type: none"> Contractor to provide 24 hours' security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices 				
• Increased GBV	<ul style="list-style-type: none"> The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse The contractor shall implement provisions that ensure that gender-based violence at the community level is not 	<ul style="list-style-type: none"> Mitigation plan for GBV occurring at the community level as a result of project implementation Number of GBV cases happening at the community level that receive survivor-centered referral and care GBV trainings 	Daily	Contractor County Government	83,200

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>triggered by the Project, including:</p> <ul style="list-style-type: none"> - Effective and on-going community engagement and consultation, particularly with women and girls; - Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc. • Ensure clear human resources policy against sexual harassment that is aligned with national law • Integrate provisions related to sexual harassment in the employee COC • Ensure appointed human resources personnel to manage reports of sexual harassment according to policy 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc. The contractor shall ensure adequate referral mechanisms are in place if a case of GBV at the community level 				
• Sexual Exploitation and Abuse by project workers against community members	<ul style="list-style-type: none"> Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan shall follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). 	<ul style="list-style-type: none"> SEA Action Plan Code of Conduct Number of staff trainings SEA FP Community Liaison trained in PSEA IEC materials for worker's sites and community Discrete SEA reporting pathway Relevant policies, 	Daily	<ul style="list-style-type: none"> Contractor County Government 	<ul style="list-style-type: none"> Covered under GBV

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<ul style="list-style-type: none"> The SEA action plan shall include how the project shall ensure necessary steps are in place for: ❖ Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials; ❖ Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential 	<ul style="list-style-type: none"> e.g. investigations and discipline and whistle-blower protection Monthly minutes from SEA coordination meetings 			

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>data management;</p> <ul style="list-style-type: none"> ❖ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights; • Management and Coordination: including integration of SEA in job descriptions, employment contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and 				

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.				
• Child labour and protection	<ul style="list-style-type: none"> • The contractor shall develop and implement a Children Protection Strategy that shall ensures minors are protected against negative impacts associated by the Project including SEA. • All staff of the contractor must sign, committing themselves towards protecting children, which 	<ul style="list-style-type: none"> • Availability of child protection strategy • Signed CoC • Identification cards for all workers 	Daily	Contractor	Covered under GBV

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>clearly defines what is and is not acceptable behaviour</p> <ul style="list-style-type: none"> Children under the age of 18 years should be hired on site as provided by Child Rights Act (Amendment Bill) 2014 Wherever possible, ensure that another adult is present when working in the proximity of children. Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger. Refrain from physical punishment or discipline of children 				
Conflicts between Contractor and Community	<ul style="list-style-type: none"> Establishment of a formal grievance and redress mechanism by the supervising consultant/Engineer; The Contractor shall be 	<ul style="list-style-type: none"> Number of grievances lodged 	Daily	Contractor	83200

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>required to minimize the possibility of occurrence of grievances with the local community;</p> <ul style="list-style-type: none"> • The contractor shall maintain a Complaints Register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken. • Copies of received complaints shall be copied to the supervising consultant/Engineer and issues to be addressed accordingly. 				
Project Intervention Priority Conflicts	<ul style="list-style-type: none"> • Continuous community engagement and participation • Establishment of a formal grievance and redress mechanism • Maintaining a complaints 	<ul style="list-style-type: none"> • Number of grievances received 	Daily	<ul style="list-style-type: none"> • National and County Government 	<ul style="list-style-type: none"> • No additional costs

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	register on site detailing all contacts of aggrieved persons, the investigations undertaken and response provided, action taken and by whom, any follow up action taken.				
• Risk of accidents at work site	<ul style="list-style-type: none"> Construction Workers and the Supervising Team to be provided with Personal Protective Equipment including gloves, gumboots, overalls and helmets. Use of PPE to be enforced by the Supervising Engineer. Fully stocked First Aid Kits to be provided within the Sites, Camps and in all Project Vehicles Isolate the site for access by the local communities during the construction for their safety and health Camps and Work Sites to be fenced off and Security 	<ul style="list-style-type: none"> Availability of incidences Occurrence book on site No of complains from workers for lacking water or sanitation facilities 	Daily	Contractor	PPEs -333,300 Facilities -83,200 Trainings -100,000

Associated Impacts	Management Actions	Monitoring Indicator	Monitoring frequency	Responsibilities	Cost
	<p>Guards provided to restrict access to members of the public.</p> <ul style="list-style-type: none"> Strict use of warning signage and tapes where the trenches are open and at other active construction sites 				
• Traffic congestion	<ul style="list-style-type: none"> The contractor shall develop a traffic management plan; The Contractor should provide temporary road signs or notices to indicate ongoing works; The Contractor together with the Resident Engineer should Plan itineraries for site traffic on a daily basis and avoid peak traffic periods; 	<ul style="list-style-type: none"> Erected traffic related signage's No of complaints raised by road users Availability of traffic management plan 	Daily	Contractor	200,000

Table 8:13: Operational ESMMP Ablution Block

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Target Areas& Responsibilities
Negative Impacts				
Environmental				
Pollution of water and soils	<ul style="list-style-type: none"> Blockages should be detected and promptly replaced; NIWASCO to attend to burst and overflows of septic tanks promptly to prevent excessive loss of soil; Provide high risk areas with appropriate drainage for effective channelling of burst sewage spills; 	Number of bursts visible blocked drainages	Daily	All work areas <u>Responsibility</u> NIWASCO
Visual and landscape impact management	<ul style="list-style-type: none"> Elaborate landscaping and maintenance of these sites can limit the viewpoints to the facilities and thus reduce their visual impact. 	Land degradation	Daily	All work areas <u>Responsibility</u> County Government of Tharaka Nithi
Social				
Risk of vandalism of the ablution block facilities	<ul style="list-style-type: none"> This shall require constant inspection by NIWASCO officials Conduct public sensitization programs on importance not interfering with the ablution block 	<ul style="list-style-type: none"> Number of vandalized infrastructures Records of reported cases 	Daily	All work areas <u>Responsibility</u> NIWASCO
Occupation Health And Safety Risks				

Potential Impacts	Management Actions	Monitoring Indicators	Monitoring frequency	Target Areas& Responsibilities
Health and safety risks	<ul style="list-style-type: none"> Regular check, repair and maintenance of the ablution block and septic tanks by NIWASCO officials. Carry continuous Public Health Awareness Provision of appropriate PPEs for workers 	<ul style="list-style-type: none"> Number of accidents and incidents Presence of waste water 	Daily	NIWASCO County Government of Tharaka Nithi

Table 8:14: Decommissioning ESMMMP Ablution Block

Potential Impacts	Management Actions	MONITORING Indicators	Monitoring frequency	Responsibilities
Negative impacts				
Environmental				
Solid Waste Generation	<ul style="list-style-type: none"> All removed materials that shall not be used for other purposes must be removed and recycled/reused as far as possible; Where recycling/reuse of the removed materials and other demolition waste is not possible; the materials should be taken to a licensed waste disposal site or arrangements made with the County Government; Donate reusable demolition waste to charitable organizations, individuals and institutions; 	Presence of solid waste in the environment	Daily	Contractor
Occupational Health and Safety Impacts				
Occupational Health and Safety	<ul style="list-style-type: none"> Provide the correct PPE for the workers when conducting the demolition activities; 	<ul style="list-style-type: none"> Records of accidents 	Daily	Contractor

Potential Impacts	Management Actions	MONITORING Indicators	Monitoring frequency	Responsibilities
	<ul style="list-style-type: none"> Conduct training on health and safety procedures to the workers prior to commencement of demolition; Proper plans should be made prior to demolition so as to contain the raw sewage and other waste water that poses as health risk to human beings and the environment, to prevent the workers and surrounding communities from getting into contact with it. 	and incidents		

8.5 Grievance Resolution Mechanism

A grievance is an expression of concern or complaint voiced by any person who feels they have been or will be negatively impacted by someone else's activities.

This ESIA establishes all the project proposed works are likely to encounter several grievances from different stakeholders specifically the community during the construction period. Some of the grievances likely to be encountered in the project include but not limited to:

- Grievances regarding destruction of property
- Gender Based Violence
- Poor working conditions
- Grievances related to payments (delayed and low wages)
- Labour influxes
- Discrimination against workers
- Discrimination against Vulnerable and Marginalized Groups
- Child labour
- Environmental degradation
- Disruption of amenities

This ESIA acknowledges the grievances are likely to occur and have established Grievance Redress Mechanism (GRM). A Grievance Redress Mechanism (GRM) is a locally based, formalized way to accept, assess, and resolve community feedback or complaints. KISIP 2 has already established a community level Grievance Redress Mechanism (GRM) by establishing Settlement Executive Committee (SEC) and Grievance Redress Committee. There is also a customized grievance redress log. There is also a customized grievance redress log. The Grievance Redress Processes include the following:

a) Grievance Reception and Acceptance: The GRC officials will receive and register complaints/concerns from all project affected or interested parties.

b) Acknowledgement, Assessment and Record: The complainant will receive confirmation from the GRC officials that his/her complaint has been received. The complaint note should contain all relevant and personal information given by the complainant(s). The GRC official should record all grievances, maintain and update the GRM Log/Register with the following information:

- Dates when the complaints are registered,
- Dates when the grievances are uploaded onto the project database,
- Information on proposed corrective actions/resolutions sent to complainant,
- Dates when complaints are closed out, and
- Dates when responses are sent to complainant(s).

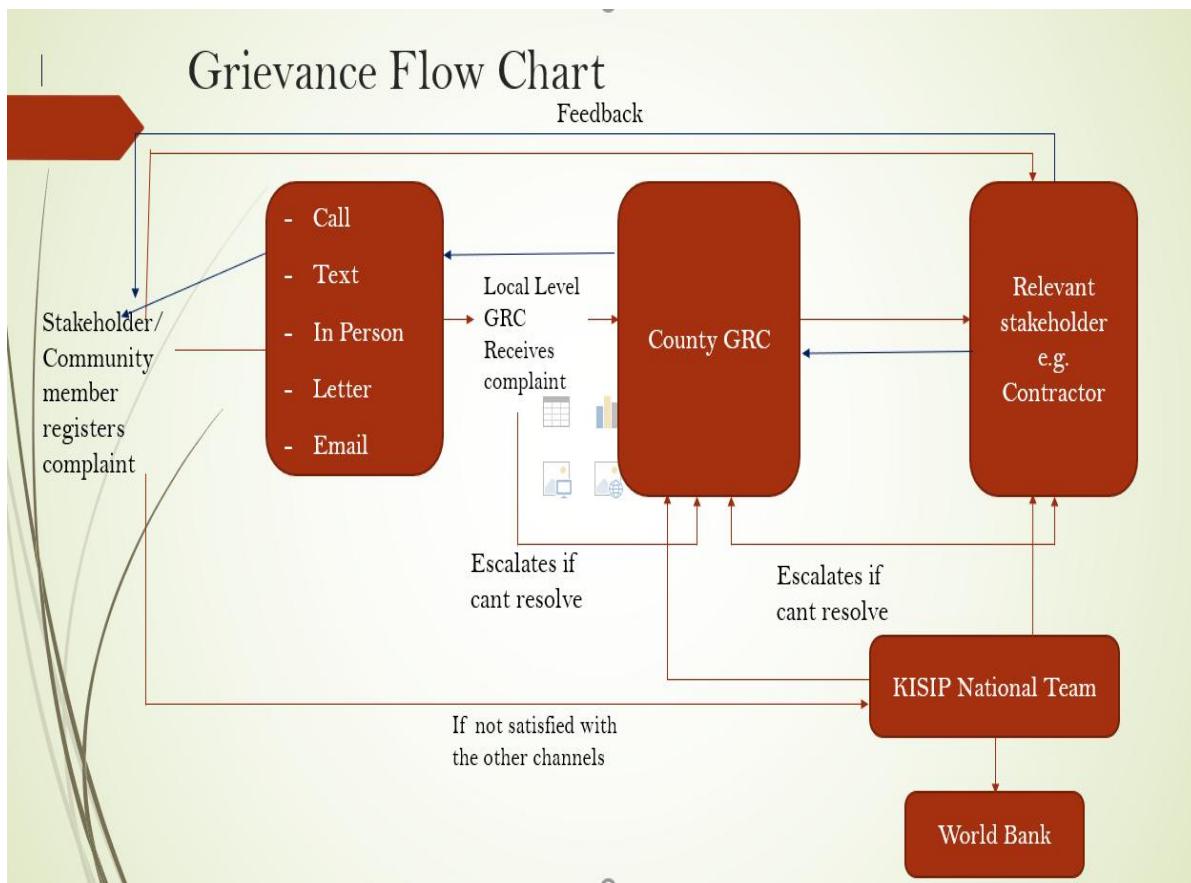
c) Investigation: Appropriate investigation will be decided at the assessment stage. If deemed necessary, the investigation can include a risk assessment. The investigation may include follow-up meetings between stakeholders and the contractor, where an impartial party is present, Minutes are recorded and added to the grievance database.

d) Resolution: Depending on the findings and their severity, a resolution will be decided within the time frames provided (See protocols 4.3). The NPCT will monitor the timelines of each resolution and ensure resolutions are made within 3 months of filing.

e) Complaint Satisfaction: **Yes:** The process concludes with a written agreement signed by the complainant(s) and management. **No:** The issue is shared with senior management. If unresolved at the settlement level, the GRC will escalate to the County. If the County is not able to resolve, the County will escalate it to the National PCT. Escalation must be done through letter or email. If it remains unresolved, or in parallel to project-level resolution, legal action may be taken. The CPCTs must inform the NPCT as soon as any court cases related to KISIP2 activities are filed, and the NPCT is responsible for informing the World Bank.

f) Documentation Management: Throughout the grievance redress process, it is important for the complaints and grievance logs to be stored in ways in which they can be easily analysed and presented. Filling of grievance forms will be done by the GRCs including resolutions and escalations. A summary grievance log will be documented in a black book or in any other manner that provides a summary of the number of grievances received, date received, the type and nature of grievances and if resolved, and or escalated. These summaries shall be collated monthly and submitted to the County GRM focal point who in turn will compile all grievance logs from within the county and submit to the National GRM focal point. A standard format for grievance logs filing and submission will be agreed and revised as necessary. This can be achieved through the use of a simple GRM database managed by the National GRM focal point with access by all the County GRM focal points.

Grievance Flow Chart



8.6 GBV GRM Protocol

KISIP 2 Project has a substantial GBV risk profile due to its location in the informal settlements, thus a separate avenue for GBV related GRM will be constituted to receive GBV related complaints that is tailored to be responsive to the sensitivities of reporting GBV and for vulnerable population.

The GBV GRM will have special procedures for responding to allegations of sexual exploitation and abuse (SEA) and sexual harassment (SH) that are made against a project actor. However, for any complaint that is reported to the GRM (including complaints involving other forms of GBV that are not related to the project), the GRM will also have procedures in place to refer the individual to GBV service providers.

For the purposes of the GRM, these terms are defined as follows:

- Gender-based violence. Gender-based violence, or GBV, is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially

ascribed (i.e. gender) differences between males and females. It includes acts that inflict physical, sexual, or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private. Across the globe, gender-based violence disproportionately affects women and girls. SEA/Sexual Exploitation (defined below) is a subset of GBV.

- Sexual exploitation. Any actual or attempted abuse of position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially, or politically from the sexual exploitation of another.
- Sexual Abuse. Actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.
- Sexual harassment. Any unwelcome sexual advance, request for sexual favours, verbal or physical conduct or gesture of a sexual nature, or any other behaviour of a sexual nature that might be reasonably expected or perceived to cause offense or humiliation to another, when such conduct interferes with work; is made a condition of employment; or creates an intimidating, hostile, or offensive work environment.
- Intimate partner violence (IPV). As defined by the World Health Organization (WHO), IPV refers to any behaviour within an intimate relationship that causes physical, psychological or sexual harm to those in the relationship. Examples of types of behaviour include:
 - ✓ Acts of physical violence, such as slapping, hitting, kicking, and beating.
 - ✓ Sexual violence, including forced sexual intercourse and other forms of sexual coercion.
 - ✓ Emotional (psychological) abuse, such as insults, belittling, constant humiliation, intimidation (e.g. destroying things), threats of harm, threats to take away children.
 - ✓ Controlling behaviours, including isolating a person from family and friends; monitoring their movements; and restricting access to financial resources, employment, education or medical care.

To fulfil the role of addressing GBV, all staff and volunteers at all levels of KISIP 2 Project should be trained (and/or have previous knowledge and experience) on the GBV Guiding Principles and the specialized procedures for receiving and referring GBV-related complaints. This set of skills will help GRM staff and volunteers to support the quality of the complaint mechanism, while at the same time ensuring the adherence to these Guiding Principles and a survivor-centred approach, including right to safety, respect, and confidentiality, of the complaint intake and management. Hotline operators should receive training on the handling of GBV related complaints in line with the principles of confidentiality and the specialized procedures.

When receiving a grievance/during the intake process, the person receiving the complaint shall respect the wishes, choices, rights, and dignity of the complainant. For the survivor/complainant to make informed decisions about whether to seek services and whether to file a complaint with the project (where the complaint involves SEA or SH), she/he needs to be provided with clear and simple information on the functioning of the system, on the possible outcomes, likely timelines, and the types of support that can be provided. The survivor/complainant must also give their consent for the sharing of basic, anonymous, non-identifiable monitoring data about the incident with the National/County KISIP 2 coordinating team and with the World Bank. If a complainant chooses not to be referred to GBV service providers or have the project take further action, then the case will be closed. The officer or volunteer must seek the survivor/complainant's consent to share basic monitoring data, and if no consent is given, no data will be recorded. For GBV cases, it is important to ensure that access to the complaints processes is as easy and as safe as possible for the complainant/survivor and that they clearly understand the referral process.

8.7 Avenues of Channelling GBV-GRM Related Cases

The avenues of channelling GBV-GRM related cases that may occur during construction phase of the project is presented in Table 8-7.

Table 8:15: Avenues of Channelling GBV-GRM Related Cases

GBV-GRM	The 1st level GRC at the project site/community level will designate 2 qualified persons within the committee who are most qualified to handle GBV-GRM matters (the Guidance Counsellor and the school principal/GBV focal person)
Communication	The County Coordinator to make dedicated toll-free contact numbers for the GBV focal persons at the project site for stakeholders' access - via posters, community consultations and awareness creation
GBV Officer	The GBV officers at the Project and County level is the focal point for the accountability, response aspects and monitoring the accountability process (e.g., determining if project-related, making sure employer, which might be the project Consultant or Contractor, is taking GBV Officer appropriate disciplinary action and investigating, etc.
GBV Service Provider	Each Project Consultant will identify existing GBV service providers in the communities and at County level to maintain a Memorandum of Understanding (MOU) for referral of GBV-GRM cases

8.8 Timeframe for processing Grievances

This section provides information on the expected timeframe for each stage of the GRM. It is expected that every responsible party will ensure they achieve the stipulated timelines. GBV/SEA/SH cases will not follow this timeframe and support must be provided to the survivor immediately due to the serious natures of SEA/SH issues.

Table 8:16: Time Frame for Processing Complaints

Process	Description	Completion Timeframe	Responsible person
Receipt of complaint	Document date of receipt, name of complainant, location, nature of complaint etc.	1 day	Secretary to GRC at project level
Acknowledgement of grievance to the complainant	By letter, email, phone	1 day	Secretary to GRC at project level
Screen and Establish the Merit of the Grievance	Review the complaint/ Listen to the complainant and assess the merit	2 days	Project level GRC Secretary & the aggrieved PAP or his/her representative
Refer unrelated project grievances	Where complaint is not related to KISIP 2 Project refer to appropriate authority and inform complainant	2 days	Project level GRC Secretary & the aggrieved PAP or his/her representative
Investigate the grievance	Visit the site, conduct investigations and interviews	1 – 3 days	Project level GRC members
Implement a redressal action	Discuss and agree on the grievance resolution	1 – 7 days	Project level GRC members & the aggrieved PAP or his/her representative
Escalate to county coordinator for a dissatisfied scenario	Refer the complainant to the County Coordinator GRC	3 – 10 days	Project level GRC Chairman
Receipt and record of complaint at county coordinator GRC	Document date of receipt, name of complainant, location, nature of complaint etc.	1 day	County level GRM Officer
Investigate/ Implement a redressal action	Review the previous action by the project level GRC/ conduct investigations and interviews. Recommend grievance resolution	2 – 7 days	County level GRM Officer

Process	Description	Completion Timeframe	Responsible person
Escalate to National Coordinator for a dissatisfied scenario	Refer the complainant to the National Coordinator GRC	3 – 10 days	National level Coordinator
Receipt and record of complaint at National Coordinator GRC Document date of receipt, name of complainant	Document date of receipt, name of complainant	1 day	National level GRM Officer
Investigate/ Implement a redressal action	Review the previous action by the GRCs/ conduct investigations and interviews. Recommend grievance resolution	2 – 5 days	National GRC
Last resort - Advice complainant of option to seek judicial redress	Where resolution is not reached, complainant is free to seek judicial redress. National Coordinator to document the case including all attempts at resolution and send a report to the TTL	7 days 5 days	National Coordinator
Close the case	Follow up to obtain feedback and document resolution in logbook	As required	GRM officers

8.9 Chance Finds Procedure

Chance find procedures are an integral part of the project ESMMP and civil works contracts. The following is proposed in this regard:

- ❖ If the Contractor discovers archaeological sites, historical sites, remains and objects during excavation or construction, the Contractor shall:
 - ❖ Stop the construction activities in the chance find area.
 - ❖ Delineate the discovered site or area.
 - ❖ Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the

responsible local authorities, or the Ministry of State for National Heritage and Culture take over.

- ❖ Notify the supervisor, Project Environmental Officer, and Resident Engineer who in turn will notify the responsible local authorities and the Ministry of State for National Heritage and Culture immediately (within 24 hours or less).
- ❖ Responsible local authorities and the Ministry of State for National Heritage and Culture would then oversee protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the National Museums of Kenya. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, namely the aesthetic, historic, scientific or research, social and economic values.
- ❖ Decisions on how to handle the find shall be taken by the responsible authorities and the Ministry of State for National Heritage and Culture. This could include changes in the layout (such as when finding irremovable remains of cultural or archaeological importance) conservation, preservation, restoration, and salvage.
- ❖ Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities.
- ❖ Construction work may resume only after permission is given from the responsible local authorities or the Ministry of State for National Heritage and Culture concerning safeguard of the heritage.

CHAPTER 9: CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

The proposed project is environmentally, legally, and socially acceptable. The potential significant environmental impacts can be adequately mitigated by the proposed measures, and it is the responsibility of the proponent and all other actors to see to it that the measures are implemented. This way, the environmental threats shall be downscaled to acceptable levels. It is on the basis above, that it is recommended that the project be issued with the necessary clearance for the project to commence implementation.

9.2 Recommendation

This assessment recommends the following provisions:

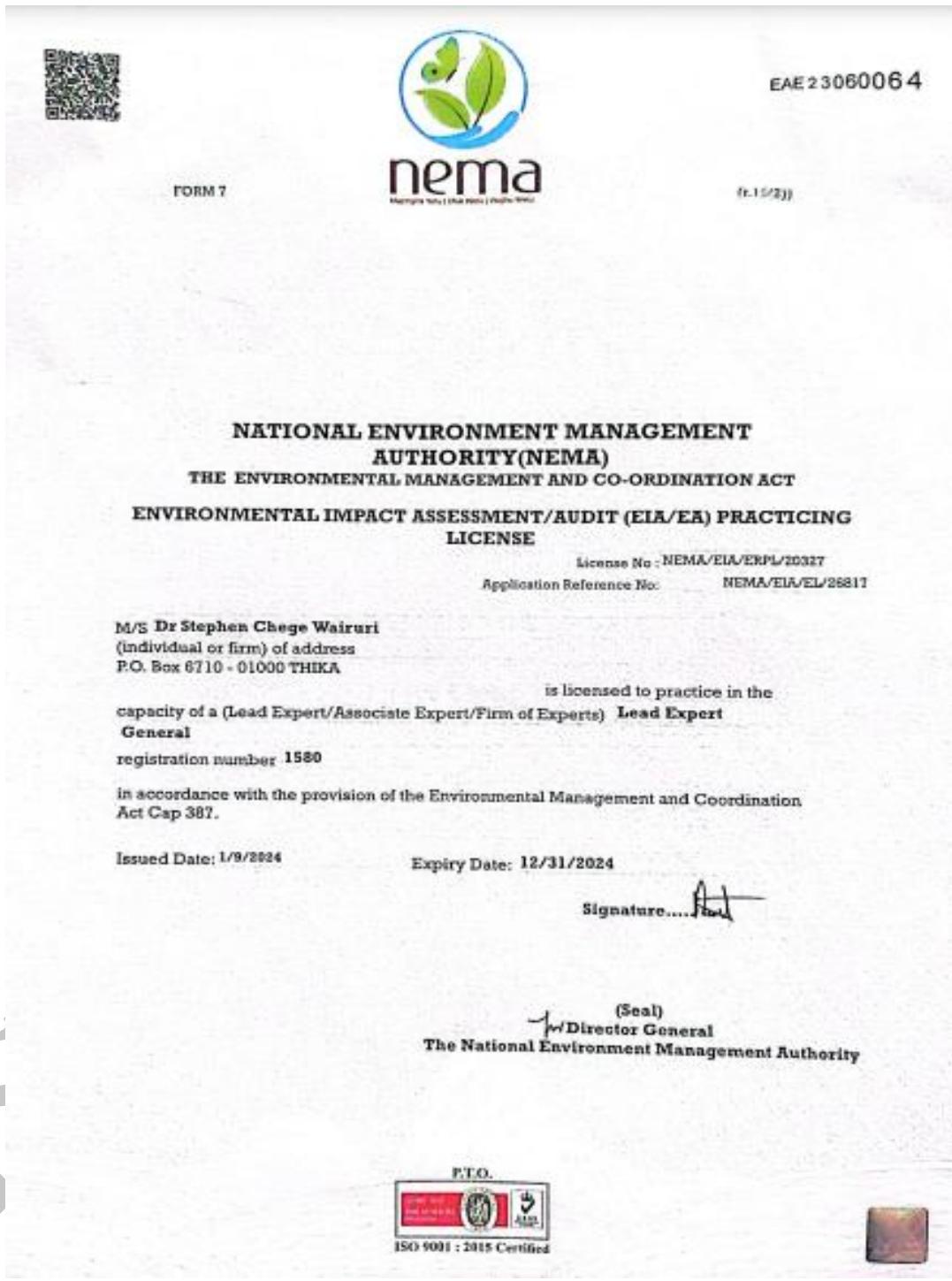
- Diligence on the part of the contractor and proper supervision by the project engineer during construction and the initial operation phase is crucial for mitigating impacts.
- Contractor shall be required to commit to implementing the Environment, Social Health, and Safety (ESHS) Provisions by developing site-specific (ESHS) plans.
- At project implementation stage, the Contractor to report to the project management team comprising of the Consultant and the project proponent monthly on how ESHS provision detailed in this ESIA are addressed.
- The proponent should be given all the available support to implement the project.
- Necessary permits should be issued by the licensing authority so that the work can commence such and NEMA license, DOSH permit, Business permit and any other relevant that may be required.
- Periodic environmental and social monitoring is required by KISIP 2 team to ensure that mitigation measures have been implemented to prevent or avert any negative impacts of the project.
- On completion of the road and Civil Works, KISIP 2 the proponent to commission an independent Consultant to undertake an initial Environment, Social, Health and Safety Audit as required by Environmental (Impact Assessment and Audit) Regulations 2003 with 2019 amendments.
- The audit shall identify nonconformities which the Contractor together with the Client shall address through the defect's liability period of the Project. This audit shall also form basis of annual Project self-audits by the Client.

REFERENCES

1. <https://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf> (retrieved on April 5, 2024, at 2:00 P.M)
2. <https://sdgs.un.org/goals>. Sustainable Development Goals
3. <https://tharakanithiassembly.go.ke/download/county-intergrated-development-plan-2023-2027/>
4. <https://www.un.org/en/climatechange/paris-agreement>.
5. KISIP 2 ESMF
6. KISIP 2 RPF
7. <https://www.knbs.or.ke/2019-kenya-population-and-housing-census-results/>
8. Republic of Kenya (2010). The Constitution of Kenya, 2010. National Council of Law Reporting. Nairobi.
9. Republic of Kenya (2000), Environment Management and Co-ordination Act, (1999), Cap 387. National Council of Law Reporting. Nairobi.
10. Republic of Kenya (2000), Environment Management and Co-ordination (Amendment), Act 2015. National Council of Law Reporting. Nairobi.

ANNEXES

Annex 1: Lead Expert NEMA License



Annex 2: Minutes and Attendance Sheet



International Development
Association
WORLD BANK GROUP



**CONSULTING SERVICES FOR INFRASTRUCTURE UPGRADING PLANS, DETAILED ENGINEERING DESIGNS
AND PREPARATION OF PROCUREMENT DOCUMENTS AND CONSTRUCTION SUPERVISION OF
INFRASTRUCTURE IMPROVEMENT WORKS IN SELECTED INFORMAL SETTLEMENTS IN THE COUNTIES
OF NYERI, MERU, THARAKA-NITHI, AND WAJIR**

KISIP 2

Project Program	Second Kenya Informal Settlements Improvement Project (KISIP 2)
Assignment Name	Consulting Services For Infrastructure Upgrading Plans, Detailed Engineering Designs and Preparation of Procurement Documents and Construction Supervision of Infrastructure Improvement Works in Selected Informal Settlements In The Counties of Nyeri, Meru, Tharaka-Nithi, and Wajir
Subject:	Minutes of Public participation Meeting for Marimanti Informal Settlement held on September 28, 2023 at Marimanti Social Hall
Date and Time:	September 28,2023
Venue:	Marimanti Social Hall

MEMBERS PRESENT NB- List of attendance sheet is attached

Name	Designation	Organization
Blanton Gitau	Engineer	KISIP National Team
Christine Sabwiri	SHO	KISIP National Team
Lydia Mbogo	Environmentalist	Losai/Gath
Moses Odhiambo	GIS expert	Losai/Gath
Risper Pete	Sociologist	Losai/Gath
Caroline Mataara	Road Engineer	Losai/Gath
Peter Kinyanjui	Assistant water Engineer	Losai/Gath
Purity Mureithi	Resident	
Doris Kendi	Resident	
Beatrice Nyaga	Resident	
Purity Mwenda	Resident	
Lucy Kajuta	Resident	
Flosy Muthoni	Resident	
Joel Njeru	Resident	
Josphat Munene	Resident	

AGENDA

1. Introduction.
2. Meeting Agenda.
3. Election of SEC and GRC members
4. Determination of the Community Priorities
5. A.O.B
6. Meeting Closure

MINUTE No.	ITEM DESCRIPTION
Min 1	<p>Introduction</p> <p>The meeting began at 9:00 a.m. with a word of prayer from one of the members. This was followed by self-introductions by all members. The Chief welcomed the attendees and handed over the meeting to the KISIP Team to take the community members through the agenda of the day.</p>
Min 2	<p>Meeting Agenda</p> <p>The Team Leader of the KISIP stated the meeting Agenda was to:</p> <ul style="list-style-type: none"> • Select a GRC and SEC committee. • Identify priority project interventions by the community members <p>The County representative underscored the crucial role of community members in identifying interventions for the KISIP 2 Project. This approach guarantees active involvement from the community, which, being well-acquainted with existing challenges, will actively contribute to shaping the project's focus and direction</p>
Min 3	<p>Election of GRC and SEC members</p> <p>The KISIP Team took the community members through the roles and responsibility of SEC and GRC members and stated their roles, function and objective will be;</p> <p>1. Grievance Redress Committee (GRC):</p> <p>Objective: The GRC will serve as a mechanism for addressing community members' grievances and concerns regarding the settlement's development projects.</p> <p>Function:</p> <ul style="list-style-type: none"> • Receives and reviews grievances from community members. • Conducts impartial investigations into reported issues. • Facilitates communication between community members and

MINUTE No.	ITEM DESCRIPTION
	<p>relevant project stakeholders.</p> <ul style="list-style-type: none"> • Recommends solutions and actions to address identified grievances. <p>2. Settlement Executive Committee (SEC):</p> <p>Objective: The SEC will be responsible for the overall governance and management of settlement affairs, ensuring that community interests are represented and protected.</p> <p>Function:</p> <ul style="list-style-type: none"> • Oversees the implementation of development projects within the settlement. • Manages settlement resources and finances transparently. • Acts as a liaison between the community and external stakeholders. • Makes decisions on matters that impact the overall well-being of the settlement. • Promotes community engagement and participation in decision-making processes. • Representing the community members • Mobilizing the community members • Creating awareness to the other community members <p>The community members were told the above by the Team leader and they were all in agreement.</p> <p>The Team Leader stated that the SEC will comprise of 11 members including;</p> <ul style="list-style-type: none"> • The Chief • Four titled land owners • Two Tenants • Faith Based Organization • Community Based Organization • Chairman • Vice chairman • Person Living with Disability • Secretary • Youth

MINUTE No.	ITEM DESCRIPTION
	<ul style="list-style-type: none"> • Widow <p>The GRC will include five members with one of the five voted as Chairman.</p> <p>The Team Leader led the meeting in the voting process and the committee members were selected.</p> <p>The vote was undertaken and the members for the GRC and SEC identified and roles allocated</p>
Min 4	<p>Determination of the Community Priorities</p> <p>KISIP Engineer underscored the pivotal role of community members in determining the priority projects to be undertaken. Providing a comprehensive list of projects within the KISIP scope, the community members were guided through the aforementioned list of selected interventions. Community members identified the following projects as the top priorities for implementation in Marimanti: [List of Priority Projects].</p> <ul style="list-style-type: none"> • Water • Roads • Drainage • High mast floodlight/street light • Street lights <p>This collective consensus reaffirms the community's endorsement of the identified projects as crucial interventions for implementation.</p>
Min 5	<p>Any Other Business</p> <p>KISIP representative expressed gratitude to all the members for taking the time to attend the meeting. He introduced the Consultant team, highlighting that they would be entrusted with the responsibility of designing the proposals put forth by the community.</p> <p>The Chief thanked the attendees for taking their time to attend the meeting and assured them that during the Project implementation they will be involved through the office and the SEC and GRC officials.</p>
Min 6	<p>Meeting Closure</p> <p>The meeting concluded at 11:30AM. Community members and stakeholders were encouraged to reach out to the project team for any additional information or clarification.</p>

Annex 3: Sample Chance Find Procedure

Chance find procedures are an integral part of the project ESMMMP and civil works contracts.

The following is proposed in this regard:

- ❖ If the Contractor discovers archaeological sites, historical sites, remains and objects during excavation or construction, the Contractor shall:
- ❖ Stop the construction activities in the area of the chance find;
- ❖ Delineate the discovered site or area;
- ❖ Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Ministry of State for National Heritage and Culture take over;
- ❖ Notify the supervisor, Project Environmental Officer and Resident Engineer who in turn will notify the responsible local authorities and the Ministry of State for National Heritage and Culture immediately (within 24 hours or less).
- ❖ Responsible local authorities and the Ministry of State for National Heritage and Culture would then be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the National Museums of Kenya. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, namely the aesthetic, historic, scientific or research, social and economic values.
- ❖ Decisions on how to handle the find shall be taken by the responsible authorities and the Ministry of State for National Heritage and Culture. This could include changes in the layout (such as when finding irremovable remains of cultural or archaeological importance) conservation, preservation, restoration and salvage.
- ❖ Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities.
- ❖ Construction work may resume only after permission is given from the responsible local authorities or the Ministry of State for National Heritage and Culture concerning safeguard of the heritage.

Annex 4: Sample filled questionnaires


REPUBLIC OF KENYA

 **IDA** International Development Association
WORLD BANK GROUP

 **AFD** AGENCIE FRANCAISE DE DEVELOPPEMENT

ESIA KEY INFORMANT INTERVIEW QUESTIONNAIRE

The Government of Kenya has received Credit facility from the International Development Association (IDA) and AFD towards the cost of the Second Kenya Informal Settlements Improvement Project (KISIP 2) and intends to apply part of the credit to procure Consultancy Services for Infrastructure Upgrading Plans, Detailed Engineering Designs and Preparation of Procurement Documents, Resettlement Action Plan (RAP) and Environmental and Social Impact Assessment (ESIA) Reports and Vulnerable and Marginalized Groups Plan (VMGP) where applicable, and Supervision of Construction of Infrastructure Works in Selected Informal Settlements in the Counties of Nyeri, Meru, Tharaka-Nithi, and Wajir.

You have been selected to participate in this exercise and we would highly appreciate your assistance for responding to all questions in this questionnaire adequately and appropriately as possible. Please fill in the following questionnaire giving in your comments where necessary.

Your response will be treated with confidentiality and will only be used for the purpose of this project.

Name of project area:	KATHUA NA MARKET
Name of the Institution:	
Name of the Respondent:	KIREMA TEOIEL
Designation:	KISIP CHAIRMAN
Tel No:	0722 508 455
Name of the Interviewer:	
Date of interview:	22/11/2023

SECTION A: GENERAL INFORMATION

1. What your views on the following infrastructures in this area?

Infrastructures	Rate (Tick appropriately)		
	Poor	Fair	Good
Water	✓		
Sanitation	✓		
Solid waste Management	✓		
Road conditions	✓		
Security		✓	
Green spaces			✓

2. Are you aware of the proposed interventions in this area under the Second Kenya Informal Settlements Improvement Project (KISIP 2) (Water, roads, sanitation, solid waste management, high mast flood lights, and street lights)?

Yes No

3. Do you support the project?

Yes No

4. State any concerns regarding the implementation of the proposed project?

N/A

5. Are there any viable options for this project?

Yes No

a) Please name them and give reasons

Green spaces, social hall

SECTION B: ANTICIPATED IMPACTS

6. What are the expected **POSITIVE** impacts of the project from the construction phase through to the commissioning and operations phases?

Security, job opportunities, improvement of roads, water connections, little

7. What are the expected **NEGATIVE** impacts of the project from the construction phase through to the commissioning and operations phases?

None

8. Do you think this project will affect the normal land use in the area and if so in what way?

N/A

9. Are there historical or cultural heritage that would be affected by this project? If so, state them.

N/A

3

10. Are there hydro-geological (ground-water) or surface water resources condition that will be affected by this project? If so, state them.

NA

11. What suggestions would you make to mitigate any adverse environmental and social impacts during the project construction, commissioning and operations?

Sprinkle water during construction

12. Any relevant observations, recommendations or comments on this project

proper
in serve a drainage

Signature:

h2

Tel No.:

Stamp :

Annex 5: Signed BoQ

DISCLOSURE COPY

Annex 6: Approved Environmental and Social Screening Report

DISCLOSURE COPY