



**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT PROJECT REPORT
FOR**

**THE PROPOSED KANYANG'ARENG RIVERBANK PROTECTION WORKS LOCATED
IN LOSAM AND KAPCHOK IN KAPCHOK WARD, POKOT NORTH SUB-COUNTY,
WEST POKOT COUNTY**

GPS COORDINATES 1° 50' 52" N, 35° 2' 18" E



**PROJECT PROPONENT
KAPCHOK COMMUNITY**

**PROJECT SPONSOR
GOVERNMENT OF KENYA/COUNTY GOVERNMENT OF WEST POKOT
WITH SUPPORT FROM THE WORLD BANK**



DECEMBER, 2021

CERTIFICATION

This Environmental and Social Impact Assessment Project Report has been prepared by GEOPLAN ASSOCIATES, a registered Firm of Experts. The report has been done with reasonable skills, care, and diligence in accordance with the Environmental Management and Co-ordination Act, no. 8 of 1999 and the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019.

We certify that the particulars given in this report are correct to the best of our knowledge.

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ON BEHALF OF KAPCHOK COMMUNITY

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TABLE OF CONTENTS

ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iv
TABLE OF FIGURES	viii
ACRONYMS AND ABBREVIATIONS	ix
EXECUTIVE SUMMARY	xi
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background	1
1.2 Project Justification.....	1
1.3 Justification of the Environmental and Social Impact Assessment (ESIA).....	2
1.4 The Objectives of ESIA Report	2
1.5 The ESIA Approach and Methodology	3
1.5.1 Desktop Studies	3
1.5.2 Field Site Assessment	3
1.5.3 Public participation and stakeholder’s consultation meetings	4
1.5.4 Individual interviews	4
1.5.5 Focused Group discussions.....	4
1.6 Covid – 19 Infection prevention and control measures	4
1.7 Content of the Report.....	5
CHAPTER TWO	6
PROJECT DESCRIPTION.....	6
2.0 Introduction.....	6
2.1 Site Description.....	6
2.2 Land ownership.....	6
2.3 Description of the proposed project activities	6
2.4 Details of Planned Activities	7
2.5 Project Designs	7
CHAPTER THREE	8
BASELINE INFORMATION	8
3.1 Introduction.....	8
3.2 Physical Environment	8
3.2.1 Climatic conditions	8
3.2.2 Topography	8
3.2.3 Geology and Soils	9
3.3 Water Resources	9
3.4. Biotic factors.....	9
3.4.1 Flora	9
3.4.2 Fauna.....	9
3.5 Socio-Economic Environment Analysis	9
3.5.1 Land-use and land tenure	9
3.5.2 Livelihood activities.....	10
3.5.3 Demography.....	10
3.5.4 Education, skills, literacy	10

3.5.5 Transport and communication infrastructure	11
3.6.6 Energy Sources	11
3.6.7 Housing Types	11
3.6.8 Sanitation	11
3.6.9 Health facilities and Morbidity	12
3.6.10 Religious beliefs and cultural practices	12
3.6.11. Social cultural norms and beliefs	12
3.6.12. Trade	12
CHAPTER FOUR.....	13
LEGAL, INSTITUTIONAL AND POLICY FRAMEWORK.....	13
4.0 Introduction.....	13
4.1 Policy Framework.....	13
4.1.1 Kenya Constitution 2010	13
4.1.2 Vision 2030.....	14
4.1.3 National gender and development policy, 2000	14
4.1.4 Policy on Gender and Sexual Based Violence 2017.....	14
4.1.5 Kenya National Youth Policy 2006	14
4.1.6 County Government Act, 2012 (No. 17 of 2012).....	15
4.2 Relevant Legislative Framework	15
4.2.1 Environmental Management and Coordination Act no. 8 of 1999 Rev 2015	15
4.2.1.1 EMCA (EIA/EA) regulations, 2003	15
4.2.1.2 EMCA (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009	15
4.2.1.3 EMCA (Waste Management Regulations 2006)	16
4.2.1.4 EMCA (Noise & Excessive Vibration Pollution Control Regulations, 2009) Legal Notice 61	16
4.2.1.5 Environmental Management and Coordination Act (Air Quality) Regulations, 2008.....	17
4.2.1.6 EMCA (Water quality regulations 2006).....	17
4.2.1.7 EMCA (controlled substances regulations, 2007.....	17
4.2.1.8 EMCA (fossil fuel emission control) Regulations 2006.....	18
4.3 Other legislations	18
4.3.1 The Physical and Land Use Planning Act, 2019.....	18
4.3.2 Land Titles Act Cap 282.....	18
4.3.3 The Wildlife Conservation and Management Act 2013	18
4.3.4 The Occupational Health and Safety Act, 2007.....	19
4.3.5 The Public Health Act (Cap. 242).....	19
4.3.6 Employment Act, 2007	20
4.3.7 Work injury benefits Act, 2007	20
4.3.8 Trade licensing Act Cap 497.....	20
4.3.9 National Construction Authority (2011).....	20
4.3.10 Climate Change Act, 2016.....	21
4.3.11 Sexual Offences Act of 2006 (The Sexual Offences (Amendment) Bill, 2016)	21
4.3.12 HIV and AIDS Prevention and Control Act No. 14 of 2006	21
4.3.13 Water Resources Management Rules, 2007	22

4.3.14 Agriculture Act, Cap 318.....	22
4.3.15 Pests Products Control Act, Cap 346.....	22
4.3.16 Food, drugs and Chemical Substances Cap 254.....	23
4.3.17 Integrated National Land use guidelines by NEMA.....	23
4.3.18 The National Museums and Heritage Act 2006.....	24
4.5.19 Penal Code (Cap. 63).....	24
4.4 World Bank Environmental Safeguards	24
4.4.1 OP/BP 4.01 (Environmental Assessment)	24
4.4.2 OP/BP 4.04 (Natural Habitats)	25
4.4.3 OP/BP 4.09 (Pests Management).....	25
4.5 International Conventions and Treaties	26
4.5.1 United Nations Convention to Combat Desertification, 1994.....	26
4.5.2 Conservation of Biological Diversity (CBD) Regulations 2006	26
4.5.3 Rio Declaration (1992) and Agenda 21	26
4.5.4 United Nations Framework Convention on Climate Change, 1992	26
4.5.5 Sustainable Development Goals (SDGs).....	27
4.6 Other structures relevant to the sub project	Error! Bookmark not defined.
4.6.1 Grievance Redress Mechanism.....	Error! Bookmark not defined.
ANALYSIS OF PROPOSED PROJECT ALTERNATIVES	28
5.1 Introduction.....	28
5.2 Alternative Location	28
5.3 Alternative technology.....	28
5.4 The No Project Alternative	29
5.5 The Project Alternative	29
CHAPTER SIX.....	30
PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS	30
6.1 Introduction.....	30
6.2 Objectives of Public Participation and Stakeholders engagement.....	30
6.3 Methods used in public participation and stakeholder consultations.....	31
6.3.1 Focused Group Discussions.....	31
6.3.2 Community meeting (public Barazas)	31
6.4 Summary of Issues Raised by the Community and Stakeholders and Response	32
CHAPTER SEVEN.....	33
POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS AND MITIGATION MEASURES	33
7.1 Introduction.....	33
7.2 Potential positive environmental and social impacts in the construction phase	33
7.2.1 Positive Socio-Economic Impacts during Construction	33
7.2.2 Negative Environmental Impacts & Mitigation during Construction.....	33
7.2.3 Negative Social Impacts & Mitigation during Construction	35
7.3 Potential Environmental and Social Impacts in the Operation Phase.....	40
7.3.1 Positive Environmental and social impacts in the operation phase	40
7.3.2 Negative Environmental Impacts in the Operation Phase	42
7.3.3 Negative Social Impacts during Operation	42

7.4 Decommissioning Phase	42
CHAPTER EIGHT	44
ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP).....	44
8.1 Introduction.....	44
8.2 Monitoring and Management.....	44
8.3 Compliance Monitoring - Operation Phase Monitoring	44
8.4 Environmental & Social Management & Monitoring Plan (ESMMP) sensitizations	46
8.4.1 Negative Environmental Impacts During Construction Phase	46
8.4.2 Negative Social Impacts During Construction Phase	49
8.4.3 Environmental Impacts during Operations Phase.....	58
8.4.4 Social Impacts during Operations Phase.....	59
8.4.5 Environmental and Social Impacts during Decommissioning.....	63
CHAPTER NINE.....	65
CONCLUSION AND RECOMMENDATIONS	65
9.1 Conclusion	65
9.2 Recommendations.....	65
REFERENCES	66
ANNEXES	67
Annex 1: Screening Checklist.....	67
Annex 2: Sample Filled in Individual Questionnaires	72
Annex 3: Minutes of Public Baraza and Stakeholders Consultation	77
Annex 4: Attendance Register for ESIA community participation	84
Annex 5: The Layout of the Proposed River Protection.....	90
Annex 6: Lead Expert NEMA Practising License	91
Annex 7: Land Ownership Documents.....	92
Annex 7.1: Letter from CEC Lands and Physical Planning	92
Annex 7.2 PDP for Kanyangareng River Bank Protection.....	93
Annex 8: Project Photo Gallery	94
Annex 9: Letter of No Objection from WRA	96
Annex 10 Integrated Pest Management Plan	97
Annex 11: Design Drawings	101
Annex 12. Chance Find Procedure	102

TABLE OF FIGURES

Figure 1 Map showing project location i.e. River Kanyang’areng as it joins the main tributary to Turkwel Gorge Dam6
Figure 2: Mean annual rainfall in Turkwell Catchment.....8

ACRONYMS AND ABBREVIATIONS

ACZ	Agro-climatic zones
AIDS	Acquired Immune Deficiency Syndrome
AMSL	Above Mean Sea Level
ASCV	Agricultural support and Chain Value
ASDS	Agricultural Sector Development Strategy
CAACs	Catchment Area Advisory Committees
CBS	Central Bureau of Statistic
CBD	Convention on Biological Diversity
CESSCO	County Environmental Social Safeguard and Compliance Officer
CDD	Community Driven Development
CIDP	County Integrated Development Plan
CoK	Constitution of Kenya
CPCU	County Project Coordinating Unit.
CRT	County Review Team
CSO	Civil Society Organizations
DOHS	Directorate of Occupational Health and Safety
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMMP	Environmental & Social Management & Monitoring Plan
FS	Feasibility Study
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GIS	Geographical Information System
GOK	Government of Kenya
Ha	Hectares
HIV	Human Immunodeficiency Virus
HVC	High Value Crops
I&AP	Interested and Affected Parties
ICT	Information and Communication Technologies
IDA	International Development Association
IE	Impact Evaluation
IKS	Indigenous Knowledge Systems
IWUAs	Irrigation Water Users Associations
KCSAP	Kenya Climate Smart Agriculture Project
KFS	Kenya Forest Service
KIHBS	Kenya Integrated Household Budget Survey
Kshs	Kenyan Shilling

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

KWS	Kenya Wildlife Services
M&E	Monitoring and Evaluation
MCM	Million Cubic Meters
MDGs	Millennium Development Goals
MEWNR	Ministry of Environment, Water and Natural Resources
MoA	Ministry of Agriculture
MOF	Ministry of Finance
MoH	Ministry of Health
NEMA	National Environment Management Authority
NET	National Environmental Tribunal
NPCU	National Project Coordination Unit
NGO	Non-Governmental Organization
NIB	National Irrigation Board
NRT	National Review Team
OP/BP	Operational Policy
OSHA	Occupational Safety and Health Act
PAD	Project Appraisal Document
PHO	Public Health Officer
PIC	Public Information Centre
PMU	Project Management Unit
PPE	Personal Protective Equipment
PRA	Participatory Rural Appraisal
PRSP	Poverty Reduction Strategy Paper
SEA	Sexual Exploitation and Abuse
SERC	Standards and Enforcement Review Committee
TOR	Terms of Reference
UNCBD	United Nations Convention of Biological Diversity
VCT	Voluntary Counselling and Testing
WASREB	Water Services Regulatory Board
WB	World Bank
WHO	World Health Organization
WRA	Water Resources Authority
WRUA	Water Resources Users Association
WSB	Water Services Board
WSP	Water Services Provider
WUAs	Water Users Associations

EXECUTIVE SUMMARY

The proposed Kanyang’areng riverbank protection project is within Kapchock ward, Pokot North Sub County, West Pokot County. It is located between Kodulem and Konyao sub-location, Losam and Kapchok location. The project area lies between coordinates 1° 50’ 52” N, and 35° 2’ 18” E. The objective of the proposed project is to protect the Kanyang’areng River, the nearby bridge and roads and enhance sustainable agriculture thus improving on food security as well as enhancing economic growth and development, which is in line with the KCSAP Project Development objective. The Kanyang’areng riverbank protection works project was proposed during a public participation budget making process involving all the relevant stakeholders and convened by the local leaders. During the public participations, flash floods were highly ranked as a recurring challenge along River Kanyang’areng to the extent that when its banks burst, it wreaks havoc destroying the nearby farms and crops. Though a seasonal river, it was noted that it renders movement of goods and people impossible for long hours as the roads and Kanyang’areng bridge becomes impassable. Over seasons the riverbanks have been highly eroded and silted, the riparian areas are also de-vegetated and deforested, contributing to the river changing its course and flooding when it rains heavily. The County’s leadership on behalf of the community saw the need to address the challenges and the project was proposed as indicated in the County Integrated Development Plan.

The project will promote conservation of farming land covering 471.5 acres on both side of the Kanyang’areng River. This project will benefit a population of 1800 persons with 1074 males and 726 females. This is inclusive of 1500 indirect beneficiaries (930 males and 570 females) and 300 direct beneficiaries (144 males and 156 females), as well as 77 vulnerable beneficiaries composed of 48 males and 29 females. The benefits of the proposed river rehabilitation project include employment creation, increased revenue for government, market for building material, increased household income, flood control, reduced sedimentation & protected riverbank, increased vegetation cover in the riparian, enhanced ecosystem services, growth of Ng’otut trading centre, increased accessibility, protected infrastructures e.g., Ng’otut primary school and improved alternative livelihood.

The project is implemented through the Kenya Climate Smart Agriculture Programme (KCSAP) – a Government of Kenya (GoK) initiative funded by World Bank/ International Development Association (IDA) – whose development objective is to increase agricultural productivity and profitability of targeted rural communities in selected counties including West Pokot. The targeted agricultural value chains include sorghum, finger millet, maize, beans, and green grams. Fruit trees including mangoes, citrus and bananas will also be planted along the valley. The specific intervention measure proposed in this project is mainly Kanyang’areng riverbank protection works. The specific activities shall involve procurement of preliminary and general items, clearing the site of obstacles, excavations, construction of gabions, groynes and bank reinstatement, growing indigenous trees and fruit species on the reclaimed river banks, etc.

The planning of the project entailed a participatory approach where the members of the community were involved in the Participatory Integrated Community Development (PICD), designs, and Environmental and Social Impact Assessment (ESIA) processes. This Environmental and Social Impact Assessment (ESIA) has been undertaken in compliance with EMCA cap 387; Rev. 2015, the Environmental (Impact Assessment and Audit) Regulation, 2003 (Rev. 2009) and the applicable World Bank’s Operational Policies. The ESIA process started by screening, followed by scoping, and then the actual ESIA study.

The County Project Coordinating Unit (CPCU) contracted a consultant to undertake an Environmental and Social Impact Assessment (ESIA) study according to Environmental Management and Coordination Act (EMCA) no. 8 of 1999 and its subsequent supplements; the Environmental (Impact Assessment and Audit) Regulation, 2003 (Rev. 2009); EMCA (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006; the Land Acts, the Water Act 2002 and the Agriculture Act among other pertinent legal and institutional frameworks regulating major development including the World Bank Environmental and Social Safeguard Policies. Other relevant legislations included the public health, policy on gender and sexual based violence, HIV/AIDS prevention and control Act, and sexual offences Act, among others.

This ESIA CPR was carried out using several methods. These were; review of existing literature on similar projects, baseline studies of the project area, among others. Interviews and stakeholder consultations were also conducted. This is normally achieved through holding meetings and barazas to discuss the pros and cons of a project, however during this period of the Corona Virus disease (COVID-19) pandemic such action may result to more spread of the virus and put more persons at risk. During these meetings, all COVID 19 protocols including keeping a social distance of 1.5 meters away, frequent sanitizing and use of masks were adhered to. Among the methods used for public participation and stakeholder consultation meetings included; community meeting which was held on 27th April 2021 and 15th may 2021 and was attended by 134 and 55 participants respectively. Of the total participants, there were 106 males and 83 females. Forty-seven (47) questionnaires were administered to the community participants, and 39 were dully filled in and returned. The community participants were also grouped into smaller groups referred to as focused group discussions. 2 FGDs were conducted for males and females. In the female FGD, there were 12 members while the male FGD had 9 members. The aim of this was to get to know the impacts of the proposed project from two different genders. Stakeholders consultation meeting was also conducted comprising people who may have interest on the project both directly and indirectly. The members of the stakeholder’s consultation meeting included; the area chief, ESIA expert, CESSCO, officer Ministry of water, officer WRA, community representative (2), Director Environment, Kanyangareng river protection works committee (3) and the County Agricultural Engineer.

Some of the issues raised included vegetation loss, increased soil erosion, risks of accidents and injuries to workers during the construction stage , possibility of HIV/AIDS spreading, drug and substance abuse within the community. Suggested measures to address the issues raised included selective removal of vegetation, establishment of indigenous tree nurseries, limiting vegetation

clearing to the project site and planting fruit trees along the cleared land, use earth excavation debris to back fill open surface and ensure proper compaction to reduce vegetation loss and soil erosion. Additionally, all workers shall be provided with personal protective equipment PPEs to avoid cuts and pricking objects, those operating machines will be keen to avoid carelessness during working hours, the workers will be trained on proper use and storage of equipment, well trained and experienced drivers will be employed. It was suggested that community members be sensitized to HIV/AIDS spread, and drug and substance abuse.

Major negative environmental and social impacts are increased soil erosion, noise and vibration generation. Additionally, Occupational Health and Safety (OHS), risk of accidents to community due increase in traffic, increased exposure to transmissible diseases including HIV/AIDS and COVID 19, child labour, Gender based violence and sexual exploitation and abuse are some of the other expected negative impacts. Proposed mitigation measures include Contractor’s Health and Safety Management Plan (CHSMP). Contractors to develop Standard Operating Procedures (SOPs) (should adhere to WHO, the World Bank and Ministry of Health guidelines on COVID 19 containment measures) for managing the spread of Covid-19 during project execution and submit them for the approval by the client before mobilizing to site, local community members to be given priority in employment opportunities, in casual and unskilled labour; Proponent to train Social Accountability and Integrity Committee (SAIC) and administration on GBV incidences monitoring, assessment, prevention and control; Proponent to ensure the contractor complies with National and WB policies and rules on welfare of children and develop and implement a SEA action plan with an Accountability and Response Framework (ARF) as part of the Contractor-ESMP. Implementation of watershed management plan will also be among the key mitigation measures

The budget for ESMMP will be Kshs **1,465,000** while the total cost for the project is Kshs **24,895,830.00** The ESMP will form part of the Contract and will be implemented by the contractor, proponent, and other stakeholders. The monitoring of the implementation of the ESMP will be by KCSAP CPCU through its County Environment and Social Safeguard Compliance Officer (CESSCO) and NEMA officers in terms of enforcement and compliance. The proponent should share the ESMP with the selected contractor and the latter will be required to develop and implement a Contractor-Specific ESMP. The CPCU will follow up and monitor implementation of the ESMP. The CPCU/ CESSCO, contractor, the proponent will be required to ensure that the mitigation measures proposed for the construction, operation and decommissioning phases in the ESMP are followed.

Considering the positive impacts of this project and the observation that the potential negative impacts are will not result to significant, cumulative, or irreversible n and will be easily mitigated through the ESMP. the project is, therefore, recommended for approval by the National Environment Management Authority (NEMA) for issuance of an ESIA license subject to annual environmental audits after operating for one year.

CHAPTER ONE INTRODUCTION

1.1 Background

Flash floods are a recurrent challenge along Kanyang’areng seasonal River to the extent that when its banks burst, it wreaks havoc destroying the farms of maize, beans, sorghum, cowpeas and green grams. Furthermore, it renders movement of people and agricultural produce impossible. The Kapchok community had prioritized the project in the CIDP- 2018-2022. The choice of the project was validated through a 3-tier process. This involved all the beneficiaries; community members and leaders; Ward leaders, Village Elders; and Sub-county technical departments (Sub CTDs). The CPCU then facilitated survey to ascertain land ownership and the design of the project. The proposed river bank protection, aims at improving agricultural productivity of the area by controlling floods through sustainable land management. The specific objective includes improving access to markets and trading; reducing soil erosion; controlling flash floods, increase agricultural productivity and income hence food security. The proposed project is to be supported by KCSAP project whose aims are to promote food security, alleviate poverty, and promote sustainable livelihoods of the rural communities. The activities involved will include conservation and protection of the river banks through construction of dykes and planting of indigenous trees and fruit trees to address the challenge. The project is estimated to **cost Kshs 24,895,830.00**.

1.2 Project Justification

The main economic activity carried out along the neighbourhood of Kanyang’areng seasonal River is crop farming mainly sorghum, cowpeas, millet, beans, maize, and green grams. These supplement the main source of livelihood in the area which is livestock rearing. The proposed river bank protection is aimed at reducing floods especially during the rainy season, control soil erosion as well as ease the movement of farm produce from the farms to the markets and to the households. This in return will boost household income and spur economic development in the area. Food security will also be gained. Controlled soil erosion will protect the farms along the river as well as improve the water quality. The proposed project activities include river training (through construction of gabions, groynes and river bank reinstatement) to control soil erosion and siltation, and planting of indigenous trees and fruit trees using sustainable farming methods. All these will contribute to food security and poverty alleviation. Equally, a significant segment of households in the project areas will benefit from resulting jobs and income from sale of agricultural produce. It is important to note that this project meets the government targets on the Big Four Agenda – especially on Food and Nutrition Security and indirectly Universal Healthcare – and the country’s vision 2030. KCSAP also targets at increasing agricultural productivity, increasing resilience to climate change (adaptation) and decreasing incidences of greenhouse gas (GHG) emission (mitigation). The proposed project is anticipated to benefit a total of 1800 persons with 1074 males and 726 females. This is inclusive of 1500 indirect beneficiaries (930 males and 570 females), a direct of 300 people (144 males and 156 females), as well as 77 vulnerable beneficiaries (poor, widow, widowers, orphans, physically challenged, elderly HIV/AIDS affected /infected) composed of 48 males and 29 females.

The following specific considerations were important in supporting the implementation of Kanyang’areng riverbank protection activities. First and foremost, this specific activity will be carried out on a seasonal water way or riparian, hence there will be no issues of displacement and compensation whatsoever. Secondly, the proposed development is very beneficial and cost effective given sand is readily available and water can be extracted off season from the sandy river way. In addition, very little operation and maintenance cost will be expected once the proposed project is completed and handed over to the community. The community will be sensitized and trained adequately for sustainability of the project. Currently crop farming in the surrounding farms increases the economy for the area residents, and by so makes investment in the project relevant to KCSAP development objective of “increasing agricultural productivity”.

1.3 Justification of the Environmental and Social Impact Assessment (ESIA)

The County Project Coordinating Unit (CPCU) contracted a consultant to undertake an Environmental and Social Impact Assessment (ESIA) study according to section 58 of the Environmental Management and Coordination Act (EMCA 387) Rev. 2015, and Environmental (Impact Assessment and Audit) Regulation, 2003, and the World Bank Environment and Social Safeguards policies; Environmental Assessment (OP 4.01) which require all new projects of this magnitude to undergo ESIA study. The main objective of the ESIA was to identify existing and potential environmental impacts and concerns that the interested and/or affected parties have with the proposed development intervention, as well as the associated prevention and mitigation measures for the negative impacts as stipulated in the proposed Environmental and Social Management Plan (ESMP) in chapter 8.

1.4 The Objectives of ESIA Report

- To comply with the Environmental (Impact Assessment and Audit) Regulations, 2003, Regulation 6, which requires that an application for an Environmental and Social Impact Assessment (ESIA) license and applicable World Bank Policies be done.
- To study the baseline environmental conditions in the project area, such as the physical, biological and socio-economic environment;
- To study the project conditions and requirements in terms of location, construction and operational requirements;
- To assess the anticipated positive and negative impacts (both environmental and social) of the proposed project and develop mitigation measures for the negative/adverse impacts and enhancement measures for the positive impacts during all phases of the project cycle.
- Prepare an environmental and social management plan (ESMP) as well as an environmental and social monitoring plan for implementation, management and monitoring of mitigation measures along with budgetary estimates, institutional and reporting requirements.

1.5 The ESIA Approach and Methodology

This ESIA began with environmental and social screening, followed by scoping and the actual ESIA study. The study involved the use of several techniques and methodologies which were necessary for collecting and collating baseline information, understanding the legal and policy framework, predicting the potential impacts, assessing the nature of the impacts and determining the order in which the impacts are to be avoided and or mitigated. The team was guided by the requirement of the National Environmental Management Authority (NEMA); Environmental Impact Assessment Guidelines, section 58 of EMCA no. 8 of 1999 and Environmental (Impact Assessment and Audit) Regulations and the World Bank Environment and Social Safeguards policies; Environmental Assessment (OP 4.01). The methods used in the study are discussed below.

1.5.1 Desktop Studies

Desktop studies were conducted by reviewing available reports, development plans and maps, and other reports on the general area, to compile relevant baseline on biophysical and socio-economic information about the study area. The biophysical information was compiled on environmental aspects such as flora, fauna, topography, drainage, soils, geology, hydrogeology, and climate. On the socio-economic environment, the studies compiled information on aspects such as population, economic activities, and land use. Desktop analysis of secondary data was undertaken to review past research done on the project area. Documents that were reviewed included among other documents:

- The KCSAP Project Appraisal Document (PAD)
- EMCA no. 8 of 1999 and Rev.2015
- West Pokot County CIDP 2018-2022
- 2019 Census Reports Volumes I and II.
- The World Bank Environment and Social Safeguard Framework
- KCSAP ESMF
- Socio-economic survey reports (2015/16 Kenya Integrated Household Budget Survey (KIHBS))
- Hydrology Assessment Study Report
- The Participatory Integrated Community Development (PICD) reports for the resident Community Driven Development Committees (CDDCs)

1.5.2 Field Site Assessment

Field site visits were carried out for biophysical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts, establish part of the environment to be affected and extent of the impacts. Observations were made on basis of a checklist and clarification sought from the local community in regard to the proposed project area. The purpose of the field visits was:

- Obtain available and relevant information and data from the local public offices including Agriculture and Livestock and the Local administration.

- Evaluate the environmental setting around the proposed project site. Observation focused on topography, land cover, flora and fauna, climate, hydrology of the area and public amenities among others
- Evaluate social, economic and cultural setting in the entire project area
- Undertake a comprehensive consultative public participation exercise to a large section of the affected persons as well as stakeholders.

1.5.3 Public participation and stakeholder’s consultation meetings

This method was used to gather direct information from the project beneficiaries on the anticipated impacts of the proposed project implementation and the potential mitigation measures. This is in compliance with the guidelines by NEMA on carrying out ESIA public consultations before the implementation of any proposed activity. Where public consultations were held the West Pokot KCSAP CESSCO took the lead and ensured compliance with all COVID-19 regulations of (social distancing of 1.5-2 metres, sanitization of hands, the number per meeting limited to 12 persons per facilitator and limiting the time of the meeting to one hour). Through public consultations written and oral information was obtained on the benefits, anticipated negative impacts and mitigation measures (refer to Annex 2 and 3 on the minutes of public participation). The CESSCO and the ESIA lead expert held a stakeholders’ consultative forum with technical and lead departments and other key stakeholders. This report has incorporated all the views and suggestions from public participation as shown in chapter 6.

1.5.4 Individual interviews

Interviews were held with the local stakeholders and community members using questionnaires to get their views on the project such as benefits, potential problems and possible solutions and whether they felt the project should be implemented or not. Out of 47 questionnaires distributed to the community members in the area 39 were filled in and returned. (Annex 2)

1.5.5 Focused Group discussions

Additionally, information pertaining the proposed activity was sought from the community members through focused group discussion with males and females community members to capture their views on concern and benefits of the proposed activity as well as what they felt should be done to minimize and/or mitigate the issues of concern.

1.6 Covid – 19 Infection prevention and control measures

The review of this ESIA is undertaken during the Coronavirus disease (COVID-19) pandemic outbreak. The preparation of the ESIA including the relevant consultations have been undertaken in strict compliance with guidelines for infection prevention and control in the country. Additionally, specific mitigation measures have been introduced to prevent the spread of the pandemic during the construction period. Moreover, consultations required as part of the mitigation measures, such as during training on E&S issues, also pose a risk of infection to communities. For this reason, the risk of contracting the virus during

consultations will be avoided, minimized and mitigated with specific measures (wearing of face masks, use of hand sanitizers/ hand washing with soap, keeping a social distance of 1.5-2m in meetings and gathering not more than 15 people for meetings) to ensure national requirements on social distancing and recommendations on how to minimize contact are adhered to.

1.7 Content of the Report

This ESIA has investigated and analysed the anticipated environmental and social impacts of the proposed project in line with the World Bank Social Safeguards and EMCA Environmental (Impact Assessment and Audit) Regulations, 2003. Consequently, the report is organized into nine substantive chapters. Following this introductory chapter, Chapter 2 presents the Nature of the proposed project and project activities while Chapter 3 presents the Baseline Information. Chapter 4 gives the Policy, Legal, Institutional and Administrative Framework. Chapter 5 Analyses the various Alternatives to the Project and Chapter 6 presents the Outcome of the Public Consultation and Participation process, Chapter 7 identifies and discusses the Potential Impacts and mitigation measures of the project. Chapter 8 presents the Environmental and Social Management & monitoring Plan (ESMMP) while Chapter 9 gives the conclusions and recommendation. Finally, References and Annexes

CHAPTER TWO PROJECT DESCRIPTION

2.0 Introduction

This chapter presents the project description in terms of site description, land ownership, project activities, project designs and estimated costs

2.1 Site Description

The proposed sub-project falls within upper Turkwel catchment. This comprises of water towers originating from Uganda. The proposed project is situated at Ngetut, 90 km from Kapenguria town along the Kapenguria-Alale road between Ngetut village Kodulem and Konyao sub location of Losam and Kapchok location, Konyao ward, Pokot North Sub-county West Pokot County (see figure 1 below). The geographical location is 1° 50’ 52” N and 35° 2’ 18” E.



Figure 1 Map showing project location i.e. River Kanyang’areng as it joins the main tributary to Turkwel Gorge Dam

2.2 Land ownership

The land on which the project will be situated is unregistered community land. A letter from Lands and physical planning (See Annex 7.1) is available. The construction of dykes will take place on the riparian land and part of the development plans (PDP) is depicted in annex 7.2. Water Resource Authority (WRA) granted a no objection for work to continue on the riparian Zone (see annex 9).

2.3 Description of the proposed project activities

The proposed project activities include:

- Conservation and protection of the riverbanks through construction of dykes

- Planting of indigenous and fruit trees

2.4 Details of Planned Activities

The planned activities during construction phase include (refer to bill of quantities prepared for this project) procurement of preliminary and general items (including construction of a site office and the Resident Engineers office as well as furnishing them, purchase of stationery, equipment and reagents to be spent, material testing, provision of labour to assist with the office cleaning, site measurements and checking and testing of the works, Provision of project sign board as per the drawing), clearing the site of obstacles, excavations, construction of Gabions, Groynes and Bank Reinstatement wall. During implementation stage, there shall be planting of appropriate indigenous trees species and other crops on the reclaimed river banks etc. The materials to be used include sand, cement, construction blocks and Hardcore.

2.5 Project Designs

Refer to Annex 9. Dykes will be constructed as per the design drawings to protect river banks from continued erosion and prevent further inundation of adjacent farms.

CHAPTER THREE BASELINE INFORMATION

3.1 Introduction

This chapter covers both physical environment and socio-economic factors of the proposed project site

3.2 Physical Environment

3.2.1 Climatic conditions

The area is characterized by two rainy season, the long rains from end of March to May and the short rains from October to early December. Rainfall analysis depicts a mean annual rainfall of 1309.4 mm. The project lies within an ASAL area experiencing low rainfall and high temperatures. The highest temperatures are experienced in January-March and lowest in June-July with an average of 30⁰C. Flash floods are a recurring challenge along the seasonal river Kanyang’areng to the extent that when it burst it wreaks havoc to farms and roads.

Details of Climate Mean annual rainfall as represented by observed stations in and around the area is presented in Figure 2. It closely compares with that downloaded from Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS, app.climateengine.org/climate Engine). Kanyang’areng catchments comprises the water towers falling across in Uganda. Rainfall here follows that of East Africa described by Ogallo 1979 as falling in March –May and again in October to December. River Kanyangareng falls within Turkwell catchment and rainfall here decreases northwards to a low of 200 mm in Lodwar while stations in the south enjoy a high of 1200 mm as represented by Kapenguria station (Henry Njuguna, 2021)

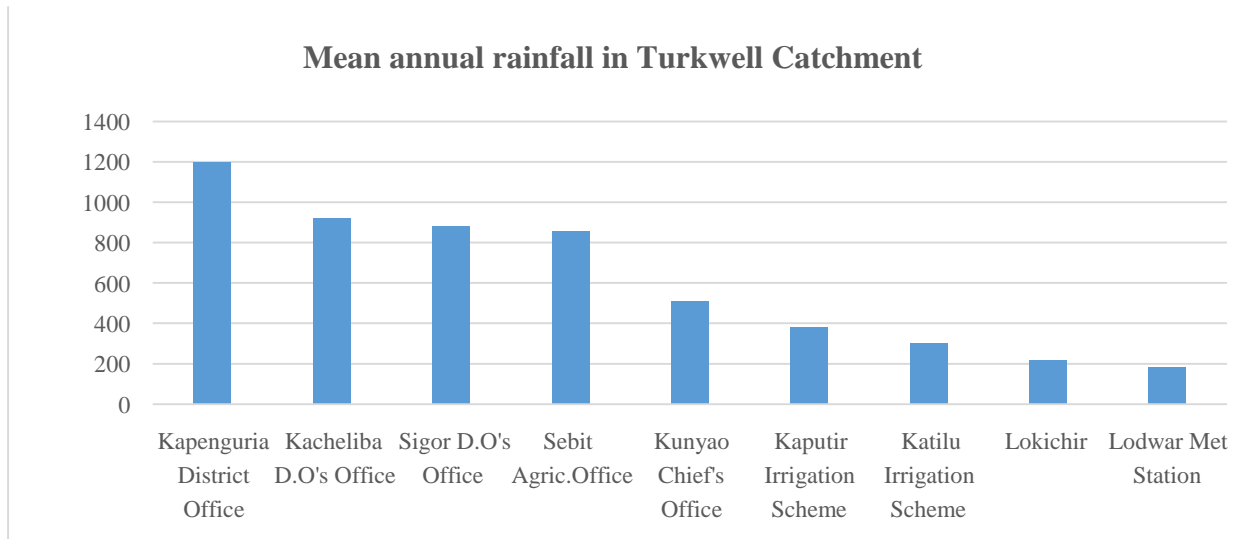


Figure 2: Mean annual rainfall in Turkwell Catchment

3.2.2 Topography

The major physical features in the project area are an undulating plain that is interrupted in few areas by low hills. The land generally slopes south eastwards with an altitude at 1173m

above sea level. River Kanyang’areng is the most striking topographical feature within the project area, and it empties its waters into Turkwel (Henry Njuguna, 2021.)

3.2.3 Geology and Soils

The Rock type in the project ward is metamorphic rocks, partly rich in ferromagnesian minerals. The Soils are well drained, shallow to moderately deep, gravelly and stony, sandy loam to sandy clay loam of various colours. The soils’ Productivity is moderate with low moisture holding capacity and high vulnerability to erosion. The alluvial deposits around the riverine environments are highly susceptible to erosion by water and wind. Soils in the hinterlands are shallow and have undergone seasons of trampling by livestock, thus easily eroded during the rainy seasons (*Project area Geology report 2021*)

3.3 Water Resources

River Kanyanga’reng is the main source of water during on and off rain season for both domestic use and livestock watering. During off seasons water is extracted from the sandy base of Kanyanga’reng river course. The season river emanates from Uganda and only flows during the rainy season though residents scoop points of the sandy river course in search for water during dry spell. Residents also access water from Ngetut and kedomich solar powered community borehole situated 3km away from the project area (*Field data 2021*).

3.4. Biotic factors

3.4.1 Flora

The vegetation found in the area is characterised by tall grass, shrubs, thorny to broad leave vegetation forming green canopy along the riparian area. The thick vegetation is as result of favourable ecological condition of fertile alluvial soils and availability of river water. The various crops grown in the ward include vegetables, millet sorghum, maize, beans and sweet potatoes. The project site is not in a protected area and does not have plants that have been marked for protection (*Field data 2021*)

3.4.2 Fauna

The major livestock kept in the sub project area includes; cattle, sheep, goats, donkeys and poultry. Wild animals include birds, reptiles, insect and rodents; squirrels, hyrax, rats etc. The proposed sub-project site is not in a protected area and is not home to any endangered or threatened animal or plant species. It also does not have a corridor for any animals. There is no protected wildlife in the sub project area or any wildlife that has been identified for special protection (**Field data 2021**)

3.5 Socio-Economic Environment Analysis

3.5.1 Land-use and land tenure

The area is mainly occupied by agro-pastoral community, who have started embracing crop farming on small scale basis as way of improving their livelihood, food security and poverty reduction. This is due to climate change and decreasing land mass which cannot adequately support nomadic pastoralism. The livestock kept are mainly local breed of cattle (10 per house hold), goats (20 per house hold), camels (1 per house hold), poultry (10 per house hold), donkeys 50 total, bee hives (10 per house hold), and sheep (30 per house hold) (*Field*

Data 2021). The crops grown include; maize, finger millet, beans, leafy vegetables and sorghum. The main land tenure system within the project ward is communal land ownership.

3.5.2 Livelihood activities

Kapchok ward where the proposed project is located is mainly a pastoralist livelihood zone. Crop farming is practised on a small scale mainly along river Kanyang’areng. The community majorly depends on livestock but in the recent years the community has diversified their livelihood into bee keeping, crop farming, fishing along river Kanyang’areng and small scale businesses. **(Field data 2021).**

3.5.3 Demography

The population of the county in the 2019 census was 621,241. This population comprised of 307,013 males and 314,213 females. The population of Pokot North Sub County 2019 is 64780 males and 69702 females. The table below shows the distribution of population by sex, number of households, land area, population density in sub locations within the project area. (Source; 2019 population and housing census)

Table 1: Distribution of Population Administrative Units

Sub Locations	Total	Sex		Total	Conventional Households	Land Area In Km ²	Density Person Per Km ²
		Male	Female				
Kapchok	7,735	3,665	4,070	1,426	1,426	195.0	40
Kamenchwa	815	390	425	160	160	36.3	22
Konyao	5,269	2,495	2,774	951	951	63.7	83
Kopeyon	626	310	316	116	116	49.8	13
Napitiro	1,025	470	555	199	199	45.2	23
Kapiyen	1,388	652	736	251	251	82.0	17
Kodulem	1,880	910	970	360	360	66.8	28
Leyo	1,311	638	673	238	238	42.8	31
LOSAM	1,364	672	691	265	265	65.1	21
Totals	21,413	10,202	11,210	3,966	3,966	647	278

Source; 2019 population and housing census, volume 11 p.130

3.5.4 Education, skills, literacy

West Pokot County has low literacy levels of 30% compared to the national level of 62%. There are 1,032 pre-primary school’s centres in West Pokot County with 838 ECD teachers. ECDE enrolment currently stands at 77,679. This enrolment represents approximately 51 per cent of the total eligible number of ECD school age children under this age bracket. Low enrolment is contributed by the nomadic lifestyle, long distances to schools and lack of enough school feeding programs. The county has a gross primary school enrolment of 89 %and a transition rate of 66 % to secondary schools. The gross secondary school enrolment stands at 75 %. Issues affecting primary school going girl child include lack of sanitary pads,

inadequate teaching staff, inadequate learning and reading materials, inadequate access to water and healthcare, insecurity, high household poverty levels, and lack of electricity connections in some schools. The project site has the following education institutions; chitkal ECDE (3km), Ngetut primary school (600m), Cheptokol primary school (7km). Apart from this, the county has the following secondary schools namely; Kapenguria, Chepareria, Ortum, Sigor, Sina and Kodich as well as extra mural tertiary level institutions to include universities and teachers training institutes. *During the implementation of the project, mitigation measures will be put in place to safeguard against child labour (Source CIDP 2018-2022, field Data 2021).*

3.5.5 Transport and communication infrastructure

The road network in the County is predominantly earth and gravel surface which makes up 87 percent of the road network. Kanyang’areng River can be accessed through Makutano-Kacheliba –Konyao Alale- murram road. The project area is 4kms away from the tarmac road. The county has no rail network, ports and airports. The airstrips are completely inactive. In terms of mobile handset communication, the major mobile operators existing in the project ward are (Safaricom, airtel and MTN-Uganda). In addition, the county has three local FM radio station namely Kalya FM, Kokwo radio and Northrift radio. They offer platforms for people to air their views and for authorities to disseminate policies and issues affecting the people (*Source CIDP 2018-2022 and Field Data 2021*).

3.6.6 Energy Sources

Energy is one of the infrastructural enablers of the three pillars of Vision 2030 and the level and intensity of commercial energy use is a key indicator of the degree of economic growth and development. The main source of energy in the county for cooking is fuel wood which accounts 90 per cent of the energy needs. Petroleum products accounts for 5 per cent of energy needs and Paraffin is used by 8 per cent of population. Other sources of energy in the county include charcoal and solar. The community in the project area use solar energy for lighting and fuel wood for cooking at 100% (*Field Data 2021, Source CIDP 2018-2022*).

3.6.7 Housing Types

Housing types found in West Pokot county are; grass thatched houses, semi-permanent and permanent houses. In overall, there are 88,026 grass thatched houses, 5,129 permanent and semi-permanent houses. Traditional grass thatched houses (manyattas) are found in most parts of Pokot North and Pokot central Sub-Counties (*Source CIDP 2018-2022*). There are 12 houses constructed with iron sheets and mud walls, 90% are made thatched and mud walls. House construction is the female role in this community, the community reported that for the last few years, they have been encountering challenges in acquiring grass for roofing due to droughts and other climate related conditions (**Field Data 2021**)

3.6.8 Sanitation

The project area is having only 5 households with pit latrines and the rest of the community use the bushes. This could contribute to the pollution of water sources particularly surface water sources and cause of related infections. There is need for intensive sensitization by the

Public Health Department and the Proponent to enhance further sanitation in the area (**field Data 2021**)

3.6.9 Health facilities and Morbidity

Health facilities in the ward include Konyau Dispensary, Amudat Hospital in Uganda 36km, Matany moroto 200km in Uganda, Kacheliba 45kms, Kapenguria 78km referral. Reported cases of diseases in the county are typhoid is leading at 40% followed by Malaria 20%, brucellosis 12%, and STIs & STDs (39.1 %) (**field data 2021**)

3.6.10 Religious beliefs and cultural practices

The people living here are Christians, but also have a strong attachment to African traditional religious practices.

3.6.11. Social cultural norms and beliefs

Men are the key decision makers at household and community level. Women are responsible for provision of housing. Men take the role of Household Headship according to culture, with male headed households being 50% while female headed households 30% and child households-20%

3.6.12. Trade

The main trading centre is Kachelipa town while the nearest townships are Ngetut center (1km), Losum (6km), Amudat in Uganda (4kms) at the junction to Ngetut (2kms), and Kanyao(11kms) and Suguta 10km away from the site. There are livestock markets at Amudat and Konyau townships where the community sell their livestock and purchase the required basic commodities.

CHAPTER FOUR

LEGAL, INSTITUTIONAL AND POLICY FRAMEWORK

4.0 Introduction

This chapter presents the legal, institutional and policy frameworks that are relevant / apply to Kanyangareng Riverbank Protection Works Project.

4.1 Policy Framework

4.1.1 Kenya Constitution 2010

The Kenya Constitution 2010 states that everyone has a right to a clean and healthy environment in Section 42(Every *person has the right to a clean and healthy environment*), which includes the right:

- a. To have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69
- b. To have obligations relating to the environment fulfilled under Article 70.

The Constitution identifies the responsibility of the national government in respect to the environment in Sections 69 and 70: Section 69 1) The State shall :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; Utilize the environment and natural resources for the benefit of the people of Kenya.

1) Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources. Section 70: 1) If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.

2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate: - a. to prevent, stop or discontinue any act or omission that is harmful to the environment; b. to compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or c. to provide compensation for any victim of a violation of the right to a clean and healthy environment.

3) For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury. *The proponent shall comply with the Kenya constitution 2010 to ensure that the proposed river bank protection does not cause any harm to the citizens as they are entitled to a clean and safe environment and that all benefit from the utilization of the natural resources.*

4.1.2 Vision 2030

The Vision 2030 is the Country’s Economic Blueprint that maps the development agenda by seeking to make Kenya a globally competitive middle-income country by 2030. It is being implemented through a series of five-year Medium-Term Plans (MTP). The overall goal of the Environment, Water and Sanitation Sector as outlined in the Vision is to attain a “clean, secure and sustainable environment” by 2030. The vision includes equity as a recurrent principle in economic, social and political programmes. Special attention has been given to investment in arid and semi-arid (ASAL) counties, communities with high incidence of poverty, unemployed youth, women, and all vulnerable groups. Devolution under Vision 2030 is expected to play a key and enhanced role in correcting existing economic and social inequalities.

The implementation of the proposed project is an effort to increase agricultural productivity for small scale holders and agro pastoral farmers of Kapchok ward, through river bank protection of the Kanyang’areng River thereby reducing soil erosion and siltation and enhancing sustainable agriculture. When implemented, the sub project is expected to improve the social and economic life of the community in Kapchok ward.

4.1.3 National gender and development policy, 2000

The policy by the department of gender, in the Ministry of Public Service, Youth and Gender outlines the national agenda for gender equality, equity and inclusivity and how Kenya intends to realize these ideals. The policy promotes national values and principles of governance in relation to equality, equity, inclusiveness and non-discrimination. *The proponent shall conform to the above policy through equitable employment opportunities for all gender without discrimination. Also during tendering all genders shall be considered equal and able to supply the required goods and services. Opportunities targeting differently abled persons shall be provided for the benefit of VMGs.*

4.1.4 Policy on Gender and Sexual Based Violence 2017

The policy puts in place a framework to accelerate implementation of laws, policies and programmes for prevention against SGBV. The overall objective of the policy is to progressively eliminate sexual and gender-based violence through the development of a preventive, protective, supportive and transformative environment. *The sub project proponent shall ensure that the community as well as employees are protected against gender and sexual based violence. This subproject ESIA has put in place plans through the ESMP to develop and implement a GBV action plan. with an Accountability and Response Framework as part of the Construction-ESMP (C-ESMP) and administration of the whole project cycle, (as required by of this policy is to put in place a framework to accelerate implementation of laws, policies and programmes for prevention and response to SGBV.*

4.1.5 Kenya National Youth Policy 2006

This Policy aims at ensuring that the youth play their role alongside adults in the development of the Country. The National Youth Policy visualizes a society where youth have an equal opportunity as other citizens to realize their fullest potential. *The proposed development Project will provide direct employment to the youth as required by the Policy.*

4.1.6 County Government Act, 2012 (No. 17 of 2012)

This is an Act of Parliament that gives effect to chapter 11 of the Constitution; to provide for county governments' powers, functions, and responsibilities to deliver services and for connected purposes.

Part VIII of the Act outlines the Principles of citizen participation in counties among others reasonable access to the process of formulating and implementing policies, laws, and regulations, including the approval of development proposals, projects, and budgets, the granting of permits and the establishment of specific performance standards and protection and promotion of the interest and rights of minorities, marginalized groups and communities and their access to relevant information. *The proponent has complied with the outlined principle of public participation through the planning, screening, designing and ESIA process. The proponent will promote public participation throughout the project cycle.*

4.2 Relevant Legislative Framework

4.2.1 Environmental Management and Coordination Act no. 8 of 1999 Rev 2015

The Environmental Management and Coordination Act (EMCA) of no. 8 of 1999 were enacted to provide an appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. Under EMCA various regulations have been enacted as

4.2.1.1 EMCA (EIA/EA) regulations, 2003

The prescribed format for Environmental and Social Impact Assessment (ESIA) guidelines in Kenya has been developed and gazetted. The regulations require that ESIA covers issues outlined in schedule 2 that is, (ecological, social, landscape, land use, and water considerations) and general guidelines in schedule 3 (impacts and their sources, projects details, national legislation, mitigation measures, a management plan, and environmental auditing schedules and procedures. *This ESIA process has complied with the provisions of these regulations. The proponent conducted screening and scoping which then informed the ESIA study based on NEMA recommendation. The proponent shall monitor the implementation of the environmental management plan in the ESIA project report on mitigation, minimization, and avoidance of adverse impacts arising from the project activities as well as enhancing the positive impacts.*

4.2.1.2 EMCA (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009

These Regulations, made under the Environmental Management and Co-ordination Act, no. 8 of 1999, make provision for the management, conservation and sustainable use of wetlands and wetland resources and the sustainable utilization and conservation of (resources on) river banks, lake shores, and the seashore. The Regulations, among other things, set out general conservation and management principles, define duties of the Standards and Enforcement Review Committee and County Environment Committees in respect of wetlands, shores and banks. It states in section III part 17 that Environmental impact assessment as required under the Act shall be mandatory for all major activities on river banks, lake shores and the

seashore. The regulation also requires that resources on the river banks, lake shores and the sea shore shall be utilized in a sustainable manner. The objective of the above regulation are;

(a) To facilitate the sustainable utilization and conservation of resources on river banks, lake shores, and on the seashore by and for the benefit of the people and community living in the area;

(b) Promote the integration of sustainable use of resources in riverbanks lake shores and the seashore into the local and national management of natural resources for socio economic development;

(c) Enhance education, research and research related activities; and

(d) Prevent siltation of rivers and lakes and control pollution or and other activities likely to degrade the environment.

The Proponent shall comply with the provisions of the Act in protecting the shoreline, preventing and controlling pollution and siltation in rivers by pre-treating water before disposal into the water bodies.

4.2.1.3 EMCA (Waste Management Regulations 2006)

The Waste Management Regulations (2006) are contained in the Kenya Gazette Supplement No 69, Legal Notice No 121 of immediate relevance to proposed development for the purposes of this scoping report is Part II, Sections 4(1-2), 5 and 6. Section 4 (1) states that No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.’ Sections 4 (2) and 6 explain that the waste generator must collect, segregate (hazardous waste from non-hazardous) and dispose waste in such a facility that shall be provided by the relevant local authority. Section 5 provides methods of cleaner production (so as to minimize waste generation) which includes the improvement of production processes through: conserving raw materials and energy. Waste management has been identified as a major problem in most construction projects. The construction of gabions and groins works shall definitely produce wastes. *The proponent and all the involved parties are expected to comply with the above regulation by adhering to the provided ESMP for measures proposed towards management of wastes generated for the proposed project. Measures to be undertaken for proper waste disposal include clearance of non-reusable and recyclable waste and disposing off in designated disposal site. The proponent will comply with the provisions of EMCA in managing wastes as stipulated under waste management regulations.*

4.2.1.4 EMCA (Noise & Excessive Vibration Pollution Control Regulations, 2009) Legal Notice 61

This regulation prohibits any person from causing unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health or safety of others and the environment. Part 11 section 6 (1) provides that no person shall cause noise from any source which exceeds any sound level as set out in the First Schedule of the regulations.

It gives standards for maximum permissible noise levels for construction sites, mines, and quarries. It also gives maximum permissible noise levels for silent zones, places of worship, residential (indoor/outdoor), mixed residential; and commercial. *This subproject ESIA has*

identified all the possible sources of noise/vibrations and has provided the appropriate mitigation measures as outlined in the ESMP for compliance with outlined maximum levels provided for in this regulation. The proponent therefore will ensure compliance with this regulation at all stages of the subproject implementation process by steering the adherence to the provided ESMP.

4.2.1.5 Environmental Management and Coordination Act (Air Quality) Regulations, 2008.

The Kenyan Air Quality Standards as part of *The Environmental Management and Co-ordination Act* no. 8 of 1999, were transposed into Kenyan legislation through *The Environmental Management and Co-ordination (Air Quality) Regulations, 2014*. As previously mentioned, these standards include a consideration of the type of area within which the proposed project is located – i.e. industrial area, residential area and controlled area. For the purposes of the air quality assessment for the proposed river bank protection, it is assumed that the residential and/or controlled area standards will apply along the whole alignment of the proposed river bank, whichever are most stringent. *The proponent will ensure compliance with Air quality regulations by enforcing all the proposed preventive and mitigation measures in the ESMP e.g. proper maintenance of machinery and avoiding unnecessary vehicle and machinery movement and idling, any stockpiles of earth (excavated), though little, to be backfilled and properly compacted or covered and watered during dry or windy conditions to reduce dust emissions. Providing masks to all personnel in dust generation areas throughout the period of construction.*

4.2.1.6 EMCA (Water quality regulations 2006)

These regulations are described in legal notice no. 120 of the Kenya gazette supplement number no. 68 of September 2006. These regulations apply to drinking water, agricultural water, water for recreational purposes water for fisheries and wildlife, and water used for any other purpose. These regulations outline,

Quality standards for sources of domestic water; Quality monitoring for sources of domestic water; Standards for effluent discharge into the environment; Monitoring guide for discharge into the environment; Standards for effluent discharge into public sewers: Monitoring for discharge of treated effluent into the environment.

The water quality standards shall be maintained by proper adherence to the mitigations provide to prevent the occurrence of water pollution.

4.2.1.7 EMCA (controlled substances regulations, 2007)

These regulations aim to regulate the production, trade and use of controlled substances and products and provide for a system of data collection to facilitate compliance. The regulations call for promoting the use of ozone friendly substances and products, equipment and technology to ensure that products used do not deplete the ozone layer.

The proponent together with other project parties shall work hand in hand to ensure that the project does not bring threats to the ozone layer. There should be fitted chimneys to prevent excessive release of gases to the atmosphere

4.2.1.8 EMCA (fossil fuel emission control) Regulations 2006

These regulations are described in Legal Notice No. 131 of the Kenya Gazette Supplement no. 74, October 2006. The regulations include internal combustion engine emission standards, emission inspections, the power of emission inspectors, fuel catalysts, licensing to treat fuel, cost of clearing pollution and partnerships to control fossil fuel emissions. The fossil fuels considered are petrol, diesel, fuel oils and kerosene.

The proponent should ensure that the vehicles are maintained and serviced regularly to protect against emission of fossil fuels

4.3 Other legislations

4.3.1 The Physical and Land Use Planning Act, 2019

The Physical and Land Use Planning Act, 2019 came into force on 5th August, 2019, repealing the Physical Planning Act of 1996 (the 1996 Act). The 2019 Planning Act govern matters relating to planning, use, regulation and development of land in Kenya. Some of the changes introduced by the 2019 Planning Act include; Increased public participation: Members of the public will now be given the opportunity to give their views and raise objections to various matters e.g. the suitability of the national and county plans; Classification of developments: Developments are no longer classified as either Class —All or Class BII but rather the 2019 Planning Act lists developments that require development permission Time allowed for land to be restored by the developer where development permission was not sought in advance, failing which the county shall restore the land at the cost of such developer; 60 days: If an applicant does not receive a response to their application for development permission after this period, such application will be deemed to have been approved; Every 10 years: Counties are required to prepare their respective county plans. *The proponent has applied for and obtained PDP for the proposed project.*

4.3.2 Land Titles Act Cap 282

The Land Titles Act Cap 282 section 10 (1) states that there shall be appointed and attached to the Land Registration Court a qualified surveyor who, with such assistants as may be necessary, shall survey land, make a plan or plans thereof and define and mark the boundaries of any areas therein as, when and where directed by the Recorder of Titles, either before, during or after the termination of any question concerning land or any interest connected therewith, and every area so defined and marked shall be further marked with a number of other distinctive symbol to be shown upon the plan or plans for the purposes of complete identification and registration thereof as is herein after prescribed.

The project site is mainly on riparian land while the farms along the river course are communally owned. The riparian land is Kenyan government land and according to water quality regulations 2006, conservation measures / activities are permissible within the full width of a river or stream to a minimum of 6metres and a maximum of 30metres.

4.3.3 The Wildlife Conservation and Management Act 2013

The Wildlife Conservation and Management Act, 2013 is solely responsible for the protection, conservation, sustainable use, and management of all wildlife resources. The principles of the Act including devolution, effective public participation, ecosystem

approach, recognition of wildlife conservation and management as a form of land use on public, community and private land, self-sustainability and sustainable utilization and equitable benefit sharing.

The proposed site is not a home of any endangered wildlife species and does not provide corridors for wildlife and thus would not cause threat to any wildlife. The project site is not habitat to any wildlife and does not contain species of biological conservation significance. Therefore, no human-wildlife conflict is anticipated during the implementation of the Kanyang’areng river bank protection works project. The proponent will however work in consideration to the available biodiversity.

4.3.4 The Occupational Health and Safety Act, 2007

This Act replaced the Factories Act (CAP514). It provides for the safety and welfare of workers and all persons lawfully present at work places and sites and provides for the establishment of the National Council for occupational safety and health (OSH) and for related purposes. There are a number of regulations under this act but the regulations related to this proposed project are the Building Operations and Engineer Construction Rules.

The proponent identifies OHS issues at all the stages of the project implementation and adequately provides for mitigation in the ESMP in this ESIA project report. The proponent will share the ESMP with the contractor to enable him/her to implement the CESMP which will be strictly followed during construction. Compliance of the CESMPs will be monitored by the regulatory agents. A comprehensive occupational health and safety audits will be carried out periodically to ensure compliance with this Act particularly in the construction phase. COVID-19 control measures have been provided in the ESMP.

4.3.5 The Public Health Act (Cap. 242)

The Public Health Act (PHA), the primary legislation applicable to matters of public health crises, authorizes public health authorities, particularly the Minister of Health, to take various actions during public health crisis, including declaring an infectious disease a —notifiable infectious disease or a —formidable epidemic, endemic or infectious disease and taking the necessary prevention and suppression measures to fight the disease. Specific powers accorded to health authorities for the purpose of prevention and suppression of an infectious disease include search, seizure, and detention powers; the power to designate any place as a quarantine area, including ships and aircraft; and the power to restrict or ban immigration into the country. Kenyan and international laws impose certain transparency requirements on the country’s government. Chief among these are the requirement under the PHA to periodically publish information regarding infectious diseases in Kenya, neighboring countries, and around the world, and the obligation under the International Health Regulations to report any public health emergency to the World Health Organization (WHO).

Section 115 of the Act states that no person/institution shall cause a nuisance or condition liable to be injurious or dangerous to human health. The law requires that all lawful, necessary, and reasonably practicable measures be taken to maintain areas under jurisdiction clean and sanitary to prevent the occurrence of nuisance or condition liable for injurious or dangerous to human health.

The proponent defines the necessary measures in the ESMP to prevent the occurrence of nuisance or condition liable for injurious or dangerous to human health during the construction and the operation phase of the project. Proposed measures include ensuring OHS during construction; dust management through watering and covering of soil stockpiles; proper disposal of unrecyclable or un-reusable waste, provision of hand washing points, provision of sanitary facilities (latrines) and community sensitization campaigns on communicable diseases such as COVID-19. Additionally, COVID-19 control measures have been provided in the ESMP and will be implemented during all phases of the project cycle.

4.3.6 Employment Act, 2007

Section.3. (1) States that this Act shall apply to all employees employed during the project implementation under a contract of service. Section 5 (3) demand that no employer shall discriminate directly or indirectly, against an employee or prospective employee or harass an employee or prospective employee on grounds of race, colour, sex, language, religion, political or other opinions, nationality, ethnic or social origin, disability, pregnancy, mental status or HIV status.

The Proponent will ensure fairness and gender equity during the recruitment of the labour force in all the phases on the project implementation. Preference will be given to the local community for both skilled and unskilled labour as provided for in the ESMP.

4.3.7 Work injury benefits Act, 2007

Section.7. (1) of the Act requires that the proponent should obtain and maintain an insurance policy, in respect of any liability that the employer may incur under this Act to any of his employees.

The proponent will engage a qualified, registered and licensed contractor for the Kanyang’areng river bank protection works project and ensure that those employed are covered insured. The contractor will also provide the necessary PPEs to the workers to avoid and minimize chances of work-related injuries.

4.3.8 Trade licensing Act Cap 497

The proponent is required by section 5 of the Act to source for the building and construction materials and machinery necessary during the project the implementation process of the proposed project from licensed suppliers.

The contractor will comply with section 5 of this Act by procuring construction materials, equipment and machinery from licensed suppliers as specified in the engineer’s design and bill of quantities. The supervising engineer will assess the quality of work and materials used in the project by the contractor making sure that it complies with this Act by following the Bill of Quantities.

4.3.9 National Construction Authority (2011)

The National Construction Authority Act, Number 41 of 2011 streamlines, overhauls and regulates the construction industry in Kenya. The Act contains provisions on the quality and safety standards of any construction work.

The proponent will ensure the engagement of a registered and qualified contractor as required under the water act for the construction of the project. The proponent will ensure that regular site meetings by all the relevant stakeholders are held to oversight the work.

4.3.10 Climate Change Act, 2016

The CCA aims at reducing 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 development and implementation of the Kanyang’areng river bank protection works project will contribute towards this Act by mitigating against climate change through tree planting and enhancing the resilience of the community to drought and other related climate change effects through promotion of sustainable agriculture.

4.3.11 Sexual Offences Act of 2006 (The Sexual Offences (Amendment) Bill, 2016)

This is an Act of Parliament to make provision for sexual offences, their definition, prevention and the protection of all persons from harm through unlawful sexual acts, and for connected purposes. Section 15, 17 and 18 focuses mainly on sexual offenses on minor (children).

The Proponent will develop and implement a SEA (Sexual exploitation and abuse) action plan with an Accountability and Response Framework as part of the Construction-ESMP (C-ESMP). The SEA action plan will 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) and National policies and regulations on SEA. The Contractor will implement the C-ESMP signed with the proponent to address and resolve all identified and emergent SEA concerns.

4.3.12 HIV and AIDS Prevention and Control Act No. 14 of 2006

This legislation provides measures for the prevention, management and control of HIV and AIDS, to provide for the protection and promotion of public health and for the appropriate treatment, counselling, support and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes. Among the purposes of this Act as outlined in section 3 (a) is to promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS; and (d) to positively address and seek to eradicate conditions that aggravate the spread of HIV infection. Section 7 makes provision for HIV and AIDS education in the workplace in this case even the informal workplace is included.

Section 12 prescribes the penalty for unsafe practices or procedures which might lead to the infection of another person with HIV. Section 31. Prohibits discrimination in the workplace based on the HIV/AIDS status of a person.

This ESIA project report has captured HIV/AIDS as a risk in the proposed project and through the ESMP provided adequate measures. The HIV Policy therefore will be complied with during implementation of the Project; the Contract will incorporate in Bid Document

and implement HIV awareness initiatives, HCT or VCT services during construction of the Project.

4.3.13 Water Resources Management Rules, 2007

The Water Resources Management (WRM) Rules, 2007 are made as per Section 110 of the Water Act, 2002 and were gazetted on 28th September 2007. The provisions and functions of the Authority are stipulated in Part III of the Water Act, 2002. As a subsidiary to the Act, a legislative supplement, The Water Resources Management Rules, 2007 was gazetted to guide all policies, plans, programmes and activities that are subject to the Water Act, 2002. The Water Resources Management Rules empower Water Resources Authority (WRA) to impose management controls on land use falling under riparian land. The project will be required to submit authorization to the Water Resources Management Authority within 12 months of the commencement of the rules as stated in Part II Section 17 (1). Failure to submit the documents may be used as a basis for revocation, variation or cancellation of the permit or authorization.

Part VII Section 97 of the Rules states that the Authority shall, where applicable, require an applicant to show evidence of compliance with the provisions of EMCA. Section 99 states the need for controlling and measuring devices for accurate measurement of the water abstracted.

The project works need authorization from the Water Resource Authority. The same body is a partner in the said project.

The proposed Kanyang'areng riverbank protection Project has already got the clearance from WRA to progress with the project. (see annex 9) this will ensure that all the set guidelines as stipulated in the said policy are followed.

4.3.14 Agriculture Act, Cap 318.

This Act is under review, however, it seeks to promote and maintain stable agriculture to provide for the conservation of soil and its fertility and to stimulate the development of agricultural land in accordance with the accepted practices of good land management and good crop husbandry. During the entire course of the project, there is need for practice of good crop husbandry as well as soil fertility maintenance as a vital component to the enhancement of agricultural output.

The project shall ensure that appropriate soil and water conservation practices are observed within the project area and the surrounding farms, fruit trees especially mangoes, oranges and pawpaw will be promoted in the farms around the project area to enhance conservation.

4.3.15 Pests Products Control Act, Cap 346

The Act of parliament regulates the importation, exportation, manufacture, distribution and use of products used for the control of pests and of the organic functions of plants and animals and for connected purposes. It also regulates against use of pest control products without due analysis from a certified analyst specialist and inspection from an appointed inspector in addition to granting due guidance on the licensing of use and storage of the said products.

The Kanyang’areng riverbank protection project is meant to reduce land degradation and improve the quality, quantity and variety of agricultural outputs from the area through the expansion of the farming activities. There are bound to be numerous crop enhancement activities involving the use of pesticides and other chemicals. The relevant provisions in the Act will seek to play an integral role in regulating the use of such products approved by Pest Control Board during the operational phase of the project and should therefore be followed within the course of the project implementation. (refer to annex 8 for IPM)

4.3.16 Food, drugs and Chemical Substances Cap 254

Section 24 of the act stipulates disposal of chemical substances in certain manner likely to cause contamination of food or water for human consumption or in a manner liable to be injurious or dangerous to the health of any person shall be guilty of an offence.

The act seeks to ensure safe use and disposal of chemical substances by the farming community during the operational phase

4.3.17 Integrated National Land use guidelines by NEMA

Chapter 3 of the integrated National land use guidelines by NEMA gives provision for the following measures to address challenges of farming along the riverbank. Provide buffer zones of between 2m - 30m width measured from the highest water mark for rivers/ streams depending on the width, water volume, whether permanent or seasonal and the use of that water. Where the highest water mark cannot be determined consider the width of the river on either side to arrive at an appropriate buffer.

In addition to stream/ river/lake setbacks, utilize erosion control devices, integrated pest management plans and rehabilitate disturbed areas. Incorporate best management practices to prevent pollution of rivers, streams, wetlands and near shore waters.

Riparian areas should be identified by the WRUAs Management of the riparian areas should be considered once they are identified - specify activities that can be allowed in such areas such as bee keeping and indigenous vegetation through WRUAs and District Environment Committees (DECs) who can come up with by-laws.

The WRUAs shall incorporate best management practices that prevent pollution of rivers, streams, wetlands, near shore waters, lake setbacks, utilize erosion control devices; integrated pest management plans, and rehabilitate disturbed areas. All activities within the riparian area must be reviewed and approved by DECs. Water Resources Authority (WRA) to profile and report the physical, chemical and biological characteristics of all the rivers, lakes, wetlands and other surface water bodies and report as national profiles e.g. the National Rivers Profile, the National Lakes Profiles among others.

Establish a comprehensive monitoring regime to such lakes, rivers and wetlands and report for compilation on the state of environmental reports. WRA to coordinate the development, adapting, and implementation of management plans that shall rationalize the use of resources and mitigate on the negative impacts on rivers and lakes. Profile and report human activities around such lakes, rivers and wetlands, clearly indicating the impact of such activities on the system. Develop, adapt and implement management plan that shall rationalize the use of resource and mitigate on the negative impacts. WRA shall be responsible for documentation and this shall be reported to the DECs and PECs and any other

related sectoral statutory committees in their jurisdiction. The DEC’s and PEC’s shall issue necessary notices and orders in order to stop degradation of such lakes, rivers, wetlands and other surface water bodies. Environmental Inspectors and Compliance Officers shall also undertake necessary enforcement actions on such incidences in accordance with EMCA No.8 of 1999, Water Act 2002 and any other relevant legislation. Preserve and maintain the rivers, natural streams and drainage ways within the developed areas by designating them as part of the open space system. To the extent possible, limit any modifications to natural gulches and drainage ways, unless they are necessary for flood protection, to preserve water quality and protect aesthetic and biological resources. Discourage the planting of eucalyptus and invasive species in the water resource areas while giving preference to alternative species such as bamboo among others as envisioned in the “Guidelines on Eucalyptus” developed by the Kenya Forest Service (KFS). *The beneficiaries shall be guided by the above guidelines in order to ensure sustainable land management practices. A no objection was granted by WRA to proceed with the river bank protection.*

4.3.18 The National Museums and Heritage Act 2006

This is an Act of Parliament to consolidate the law relating to national museums and heritage; to provide for the establishment, control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya; to repeal the Antiquities and Monuments Act (Cap. 215) and the National Museums Act; and for connected purposes. This act together with World Bank policy OP 4.11 on Physical Cultural Resources will be quoted if the project will encounter such materials. *The Contractor will follow the chance find procedures outlined if previously unknown heritage resource is accidentally encountered during the project construction period.*

4.5.19 Penal Code (Cap. 63)

This act addresses commission of offenses that are punishable by law. Section 191 of the Penal Code provides that any person or institution that voluntarily corrupts or fouls water for public springs or reservoirs, rendering it less fit for its ordinary use shall be guilty of an offense.

The proponent has taken all the necessary measures to ensure that the provisions of this Act are complied with through this ESIA/ESMP. The proponent has taken precautionary steps towards preventing or reducing adverse effects that might arise from the activities of the proposed Kanyangareng river bank protection project in the whole project cycle.

4.4 World Bank Environmental Safeguards

A group of Operational Policies (OPs) have been developed by the World Bank Management as being particularly important in ensuring that the banks’ projects do no harm to people and the environment. The following World Bank environmental safeguards (Operational Policy (OP) /Bank Procedure (BP)) will guide the proposed project.

4.4.1 OP/BP 4.01 (Environmental Assessment)

The principal objective of OP/BP 4.01 is to ensure that World Bank financed projects are environmentally sound and sustainable. The policy is triggered if a project is likely to have

potential (adverse) environmental risks and impacts in its area of influence. OP/BP 4.01 covers impacts on the natural environment, human health and safety, and trans-boundary and global environment. The assessment has considered: the natural environment (air, water, and land); human health and safety social aspects (involuntary resettlement, indigenous peoples and physical cultural resources).

The proposed project was screened for environmental and social risks and subjected to ESIA, which is the subject of this report. This report has established all the significant impacts that need to be addressed and proposed appropriate measures to prevent or reduce any risk that may be posed to the physical, biological and social environment. The adverse impacts and their mitigation measures are well outlined in the ESMP including responsible parties, duration and cost in the whole project cycle. The public were consulted as required by this Policy.

4.4.2 OP/BP 4.04 (Natural Habitats)

The policy is intended to promote environmentally sustainable developments by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water area where most of the native plant and animal species are still present). *The proposed site has no known species of biological conservation significance. The proponent through this ESIA and ESMP has proposed measures for protecting, preserving and conserving the environment in the project setting from anticipated adverse impacts. The proponent will undertake the planting of indigenous and fruit trees in the project area.*

4.4.3 OP/BP 4.09 (Pests Management)

The policy is meant to minimize and manage the environmental and health risks associated with pesticide use and promote and support safe, effective, and environmentally sound pest management. *Farming along the riverbank may increase the use of pesticides and fertilizers which goes against the pest management policy. The project will prepare an integrated pest management plan that will focus on the impacts and mitigation measures that will arise during the entire project life cycle (refer to annex 8 for IPM).*

4.3.6 OP/BP 4.10 (Indigenous Peoples)

The objective of this policy is to design and implement projects in a way that fosters full respect for Indigenous Peoples’ dignity, human rights and cultural uniqueness and so that they receive culturally compatible social and economic benefits and do not suffer adverse effects . The beneficiaries and the project ward populace are entirely Pokot community who are not considered to trigger OP/BP 4.10.

4.5 International Conventions and Treaties

Kenya has ratified or acceded to numerous international treaties and conventions. Those that have direct connection with the proposed sub Project are described below.

4.5.1 United Nations Convention to Combat Desertification, 1994

The convention addresses issues of concern related to land degradation through desertification and the impact of drought, particularly in arid, semi-arid and dry sub-humid areas, known as the drylands. This convention is domesticated in EMCA no. 8 of 1999; Rev.2015.

The proponent will conform to the above convention by promoting reforestation and afforestation activities through planting of indigenous trees and fruit trees by the locals in the farmlands along the river.

4.5.2 Conservation of Biological Diversity (CBD) Regulations 2006

These regulations are described in Legal Notice No. 160 of the Kenya Gazette Supplement No. 84 of December 2006. The regulations apply to the conservation of biodiversity which includes Conservation of threatened species, Inventory, and monitoring of BD and protection of environmentally significant areas, access to genetic resources, benefit-sharing and offenses and penalties.

The proposed project site is not habitat to any threatened or endangered species of flora or fauna. Therefore, it does not pose any threat to any plant or animal life in the project context. The Proponent and contractor will ensure that great care is exercised in the protection of vegetation during construction by selective/ minimal removal of trees limited to the project site and later replacement.

4.5.3 Rio Declaration (1992) and Agenda 21

Principle 17 of the Rio Declaration on Environment and Development calls for use of ESIA as a national decision-making tool to be used in assessing whether proposed activities are likely to have a significant adverse impact on the environment. It also emphasizes the role of competent national authority in the decision-making process. It stresses the need to exercise the precautionary principle. Agenda 21, which was also as a result of this convention, enabled governments (Kenya included) to: “Promote the development of appropriate methodologies for making integrated energy, environment and economic policy decisions for sustainable development, inter alia, through environmental impact assessment (9.12(b)). Agenda 21 sets the framework within which countries can establish their national environmental laws.

The Proponent has complied with the above treaty by engaging qualified and registered experts in undertaking this ESIA which is a tool that shall assist in identifying the environment and social impacts for the proposed Kanyang’areng riverbank protection works and their mitigation measures, which will ultimately promote sustainable development.

4.5.4 United Nations Framework Convention on Climate Change, 1992

It sets the ultimate objective of stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (human-induced) interference with the climate system. Development projects in Kenya such as the

proposed project are expected to take climate change issues into consideration, to the extent possible, in their relevant social, economic, and environmental policies and actions.

The proponent through the implementation of the Kanyang’areng riverbank protection works project will contribute towards enhancing resilience to impacts of climate change and reduction in GHG emissions through increased planted vegetation and trees, therefore, contributing to the goals of this convention.

4.5.5 Sustainable Development Goals (SDGs)

The following goals are relevant to the project.

Goal 1: No Poverty (end poverty in all its forms everywhere)

Goal 2: Zero hunger (End hunger, achieve food security and improved nutrition and promote sustainable agriculture.)

Goal 13: Climate Action (Take urgent action to combat climate change and its impacts)

Goal 5: Achieve gender equality and empower all women and girls

The proposed Kanyang’areng riverbank protection works project will contribute to the SDGs by; improvement of crop production and productivity through sustainable agriculture, planting fruit trees and indigenous trees and promotion of gender equality throughout the entire project cycle.

CHAPTER FIVE

ANALYSIS OF PROPOSED PROJECT ALTERNATIVES

5.1 Introduction

During formulation of the proposed development, several alternatives were considered to ensure that the best option of project development was adopted. The project alternatives considered included:

5.2 Alternative Location

An alternative location is one of the options considered for this project. In this case, the proponent will have to move the project to another site instead of implementing it on the proposed site. However, this is not a feasible option considering that the proposed site was chosen by the community in consultation with other stakeholders and experts from County Government and National Government on the suitable site after considering all other alternatives sites and the site to be protected.

5.3 Alternative technology

The following options were considered as possible technical alternatives in controlling the floods and protecting the riverbank: river training by erecting different types of embankments and using different types of spurs (Groynes).

There are two types of embankments: Marginal embankments or dykes or levees and Retired embankments. The marginal embankments are constructed as close to the banks as possible to restrict the flood water from submerging the area behind them, while Retired embankments are constructed at a distance from the riverbanks. Thus, retired embankments are the intermediate type between the case of marginal embankments and river with no embankments. Retired embankments are generally constructed on a lower ground away from the banks. The aim of providing levees is to confine the river flood water within the cross section available between the embankments. The retired embankments are costlier than dykes due to increased height and risks; hence the project considered the low-lying dykes (levees).

A spur is a structure constructed transverse to the river flow and is projected from the bank into the river. In practice, there are two types of spurs- either ‘Permeable’ or ‘Impermeable’. Permeable spurs are constructed by driving wooden bullies or bamboos, filled in with brush wood, with sarkanda mattresses or other suitable material. These are helpful in causing quick siltation due to damping of velocity. They are useful when concentration of suspended sediment load is heavy as they allow the water to pass through them easily. Impermeable spurs are made of solid core, constructed of stones or earth and stones with exposed faces protected by pitching. These spurs can withstand severe attacks as compared to the permeable spurs. Based on the working characteristics, spurs may also be classified as (a) repelling (deflecting), (b) attracting and (c) neutral (sedimenting) spurs. Repelling or deflecting spurs are those which incline upstream at an angle of 60° to 70° to the river course and deflect the current towards the opposite bank. They cause silting in still water on the upstream pocket. Attracting spurs incline downstream and allow deep channel flow continuously along their noses. They cause scour just on the downstream side of the head due to turbulence. The river flow is attracted towards the spur.

River training by erecting low lying dykes (levees) and use of impermeable spurs with deflecting working characteristics were recommended for Kanyangare’ng river protection works due to the above reasons.

5.4 The No Project Alternative

The “No project scenario” was rejected as it was counter development since the community required protection of the river bank which will lead to the improvement of their livelihoods.

5.5 The Project Alternative

This is the proposed project, which encompasses river training by erecting low lying dykes (levees) and use of impermeable spurs with deflecting working characteristics as designed by the engineer on the current location indicated in this report. The methods utilize locally available materials, are cost effective and efficient. In addition, the impermeable spurs can withstand severe attacks as compared to the permeable spurs. This option was considered the best option because it shall guarantee river bank protection. This will cause improvement of the environment, livelihoods, and potential for improvement of biodiversity conservation.

CHAPTER SIX

PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS

6.1 Introduction

This chapter presents the participatory and stakeholder consultation processes, the methods used to engage the public and community members, and the outcomes of the participation. The government of Kenya has enshrined the need for public involvement in project development in the Constitution of 2010. This has also been set out in the EMCA, no. 8 of 1999 and Environmental (Impact and Audit) Regulations, 2003. It is also a requirement for Bank funded projects of this magnitude to undergo public participation. Public participation and Stakeholder engagement is most effective when initiated at an early stage of any proposed project development process and is a crucial part of early project decision making, the assessment, management, and monitoring of the project. Additionally, it is critical in any construction project due to varied interests among different parties involved. Effective stakeholder engagement can significantly improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. Public participation and stakeholder engagement is an inclusive process conducted throughout the project life cycle.

Where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project environmental, public and stakeholder engagement is a process through which stakeholders influence and share concerns over development initiatives, the decisions and resources which affect them. It is a vital process that provides an avenue to involve project affected groups and other stakeholders in the disclosure of information concerning a project, to deliberate at an early stage on issues that will need to be addressed both environmentally and socially and the course of action most suited to achieve mitigation of the negative impacts emanating from the development and implementation of the proposed project as well as enhancing project benefits to the stakeholders.

6.2 Objectives of Public Participation and Stakeholders engagement

The objectives of engaging the community members and other stakeholders in this project include: Build up confidence between the stakeholders and the proponent to minimize the risk of delays in the implementation of the proposed project; Help the project proponent to make informed assessment of public opinion about the project, and the nature and extent of opposition likely to occur during the implementation stage; Bring out the contentious issues and gives a chance to those who may be affected by the proposed project to give their views; Have a fair interaction with affected groups and identify with them strategies to minimize the negative impacts of the proposed river bank protection; and get No Objection from them as well as broad community support for the proposed project.

6.3 Stakeholder Mapping

The ESIA team undertook a stakeholder mapping exercise and analysis. All identified stakeholders were consulted with the motive of collecting their views as regards the project and associated beneficial and adverse effects. The views and comments have been incorporated in this report. Effort was made to contact all with information on the following issues:

- a) Assessment of the baseline environmental and social conditions
- b) Consideration of feasible and environmentally and socially preferable alternatives
- c) Protection of human rights and community health, safety and security (including risks, impacts and management of project’s use of security personnel)
- d) Protection and conservation of flora and fauna
- e) Labor issues (including labor standards), and occupational health and safety
- f) Impacts on affected communities, and disadvantaged or vulnerable group

Table 1: Stakeholder Mapping Checklist

No.	Stakeholder (Primary/Secondary)	Category
1	KCSAP members	Proponent/Project implementers
2	People directly and indirectly impacted by the project	Project Affected Persons (PAP)
3	Officials from County Government of Taita Taveta	County Government/Devolved unit
4	Chief/Sub chief	Local administration/Central unit

6.4 Methods used in public participation and stakeholder consultations

The process of public participation and stakeholder consultation is normally achieved through holding meetings and barazas to discuss the pros and cons of a project. However, during this period of the Corona Virus (COVID-19) pandemic such action were discouraged to prevent spread of the virus and putting more persons at risk. In adherence to the guidelines released by NEMA on conducting public participation and comply with the MOH protocols, the consulting team avoided meetings and used the methods discussed below to collect the required information.

6.4.1 Focused Group Discussions

Focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perception’s attitudes, beliefs, opinion or ideas. In the case of the proposed river bank protection of Kanyangareng river. Two FGDs for males and females comprising of 25 participants were conducted on 14th and 13th May 2021 to help bring home the views of all genders concerning the proposed project (Minutes for both in annex 3).

6.4.2 Community meeting (public Barazas)

The community meeting targeted the community members with interest in undertaking farming along the Kanyang’areng River including agro-pastoralists and pastoralists. Preliminary meetings were held with key informants and key stakeholders (37 participants) and follow up meetings in form of community Barazas (2) were held on 10th July 2020 and

15th May 2021. This was carried out to promote project acceptance by the community members and promote inclusivity during project implementation. The consultants were helped by the chiefs and local village elders to mobilize the community members to attend the meeting that was held at Ngotut centre; a common community meeting was held at the project site. A checklist for baseline information during the public participation was filled in. (annex 2) Minutes for the public participation and stakeholder meetings were written and annexed. (annex 3)

6.5 Summary of Issues Raised by the Community and Stakeholders and Response

The community participants all welcomed the proposed project development on the basis of the perceived direct and indirect benefits that include; job creation, increased agricultural productivity and nutrition, Increased household incomes, Increased school enrolment as children will be able to cross the bridge near Ngotut centre once the waters are contained, Increased vegetation cover, Controlled soil erosion, Reduced floods, Livelihood diversification and Improved living standards. They however raised the following concerns:

Issues Raised /Concerns	Response on mitigation measurers
Vegetation Loss and disturbance	Selective removal of vegetation, Establish indigenous tree nurseries, Limit vegetation clearing to the project site and Plant fruit trees along the cleared land
Increased soil erosion	Minimize exposed areas by properly demarcating the project area to be affected by the construction works, Use earth excavation debris to back fill open surface and ensure proper compaction, Selective removal of vegetation, Encourage roof water catchment within the project site, Establish indigenous tree nurseries
Risks of accidents and injuries to workers	The workers should always wear PPEs to avoid cuts and pricking objects, Those operating machines should always be keen to avoid carelessness during working hours, Train the workers on proper use and storage of equipment, employ well trained and experienced drivers.
Moral decay /unwanted behaviours/social evils	Sensitisation of community and site workers on ensuring high moral standards and healthy relationships

CHAPTER SEVEN

POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS AND MITIGATION MEASURES

7.1 Introduction

The proposed project activity will result in both positive and negative environmental and social impacts to the community as shown below.

7.2 Potential positive environmental and social impacts in the construction phase

7.2.1 Positive Socio-Economic Impacts during Construction

a) Employment Creation

Construction works will provide employment opportunities for both skilled and unskilled labour in the form of casual labourers, masons, carpenters, joiners, electricians and plumbers during the project construction phase.

b) Source of Revenue for Government

The supply of construction materials to the project and fuel will contribute revenue to the county and national government in form of VAT, Cess, fuel levies among others.

c) Provision of Market for Supply of Building Materials

The construction works will require supply of large quantities of building materials such cement, timber, steel, among others most of which will be sourced from the local market.

d) Increased household income

Beside employment of community members in the project during construction the proposed project will also create market for sale of construction materials by the locals and foodstuffs by women to the workers. This will lead to increased household income and improved living standards during the construction phase.

7.2.2 Negative Environmental Impacts & Mitigation during Construction

(a) Vegetation Loss

Vegetation cover in the project area consists of shrubs are likely to be removed during the excavation thus impacting negatively on existing biological life. Slight increase in vegetation clearing while constructing the gabions and dykes may interfere with the natural ecosystem.

Proposed mitigation measures include: *Development and implementation of an afforestation plan in consultation with all stakeholders including the community – This is already in place; Support establishment of a community tree nursery for indigenous trees; Sensitization of the labour force against felling trees outside demarcated areas for firewood or sale; Compensatory planting of trees or other appropriate vegetation after construction works; Construction workforce to be sensitized on environmental and ecological conservation; and Have strict control of construction vehicles to ensure that they operate only within the area to be disturbed by access routes and other works; and avoid cutting down indigenous tree species.*

ii) Increased soil erosion and siltation

There could be an increase in the soil erosion at the area during the construction activities that involves excavation, use of heavy machinery and vegetation clearing. This will remove the ground cover resulting in bare land thus leaving the soil exposed to agents of soil erosion by winds and rainwater leading to siltation of the river and affecting the aquatic life.

Mitigation measures will comprise: *Contractor to limit excavation to the marked boundaries of the project site; use designated routes for the vehicles to avoid accelerated de vegetation that causes soil erosion; clearance of vegetation should wait until the contractor is ready to undertake excavation; and Excavated earth should be held on locations of the site not susceptible to storm water runoff to avoid siltation of the river. Further, the works are to be concentrated on approximately 200M section of the banks of a lengthy (over100KM) seasonal rive. Trainings of stakeholders on river bank protection and conservation will be up scaled.*

iii) Soil Compaction

The traffic especially of machineries and the construction workforce within the project areas is likely to lead to compaction of the soil structure further leading to reduced capacity of the water to infiltrate into the soil thereby affecting the soil -water balance and the hydrological cycle largely.

Mitigation measures: *Control construction vehicles to ensure that they operate only within the area marked to be disturbed by access routes and other works to avoid accelerated soil compaction.*

iv) Air pollution (Dust and Exhaust emissions)

During construction, the project will generate substantial quantities of dust at the construction site and the farmlands while establishing the crop fields and dykes. The sources of dust emissions will include excavation, levelling, tilling works, and to a small extent, transport vehicles delivering building materials, emission of large quantities of dust may lead to significant impacts on construction workers and the neighbouring local residents. The trucks used to transport various building materials from their sources to the project site might contribute to increases in emission of CO₂, NO_X and fine particulates along the way as a result of diesel combustion. Such emissions can lead to health complications among the workers. The impacts of such emissions can be greater in areas where materials are sourced and at the construction site as a result of frequent gunning of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas.

Mitigation measures: *Any stockpiles of earth (excavated), though little, should be enclosed or covered and watered during dry or windy conditions to reduce dust emissions; Drivers and machine operators to avoid unnecessary running of engines when not in use; Dust masks should be provided to all personnel in dust generation areas throughout the period of construction; and All equipment on site should be properly maintained and in good operating condition so as to emit minimal air pollution.*

v) Excessive noise and vibration

The construction works, delivery of building materials by heavy trucks, blasting and use of machinery/equipment including bulldozers, generators, metal grinders and concrete mixers will contribute to high levels of noise and vibration within the construction site and the surrounding area. Such noise within the site can affect project workers and the residents, passers-by and other persons in within the vicinity of the project site.

Mitigation measures will include: *People working in the construction site should be provided with ear muffles; Sound-attenuated equipment should be used in as much as possible; Ensure use of equipment with exhaust systems in good working condition should be encouraged to reduce the noise levels; and the equipment should also be regularly serviced and maintained.*

Vi) Increased solid waste generation

Large quantities of solid waste will be generated at the site during construction works. Such waste will consist of metal cuttings, rejected materials, surplus materials, surplus spoil, excavated materials, papers, paper bags, empty cartons, broken glass, and single use COVID 19 prevention face masks among others. Such solid waste materials can be injurious to the environment through chocking of water bodies, blockage of drainage systems and human and animal health. This may be heightened by the fact that some of the waste materials including metal cuttings and plastic containers which are not biodegradable and can have long term and cumulative effects on environment.

Proposed mitigation measures are: *The excavated material shall be recycled; Minimizing waste generated by adopting cleaner production methods such as conserving raw materials, enabling the recovery and re-use of the waste product where possible; Use durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time; and Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements of nature i.e. sunshine, rain etc.*

vii) Oil Spills

The machines on site and vehicles contain moving parts, which require continuous oiling to minimize the usual corrosion or wear and tear. Possibilities of such oils spilling and contaminating the soil and water on site are real.

Mitigation measures: *Proper maintenance of vehicles and other equipment (those using petroleum products) to avoid fuels and lubricants spills at the project site; The contractor should properly handle, storage, and disposal off oils and greases and their wastes during construction by ensuring that servicing is strictly done at designated servicing yard or external petroleum stations; and Site staff to be sensitized on safety procedures for fuel storage and re-fueling should be well understood and implemented by site staff.*

7.2.3 Negative Social Impacts & Mitigation during Construction

(a) Occupational Health and Safety (OHS)

During the excavation and construction stage of the river and the banks accidents may occur. Accidents may also occur in the construction of the gabions and injuries by wrongly placed equipment, tools or other construction materials.

Mitigation measures; *The sites to be protected or fenced off from unauthorized intrusions and warning signs installed; barricades should be properly placed and strictly adhered to; All workers to be provided with full protective gear (PPEs) and to use them; Workers to be trained on first aid & a fully equipped First Aid Kit provided at site; The contractor to have Incident and Accident Registers on site for recording of injuries or any OHS incidence; Contractor to prepare an emergency management and preparedness plan for accident response & avail Emergency contacts for police, ambulance, etc.; Contractor to appoint a qualified health and safety person to manage OSH issues; and Tools and equipment to be placed in a safe place when not in use.*

(b) Risk of Accidents to the community

Hauling of equipment (plant and machinery) and other materials and supply to the project site may pose a potential risk of accidents to animals, people, especially children.

Mitigation measures are: *Contractor to sensitize the community on the project and the project period and what caution to be taken by the community; Contractor to employ qualified drivers; Drivers to be instructed to observe required speed limits and Installation of warning sign boards at the construction site and identified risk areas.*

(c) Increase in incidences of HIV/AIDS and STIs

The inflow of people as site workers and traders, may bring communicable diseases to the sub project area such as HIV/AIDs and other sexually transmitted infections (STIs).

Mitigation measures: *Contractor will sensitize workers and community members on HIV/AIDS and other communicable diseases; Contractor’s Health and Safety Management Plan (CHSMP) to be enforced through the Directorate of Occupational Health & Safety (DOSHS); Controlled access to Contractor’s Workforce Camps by outsiders; and Contractor to provide standard quality condoms at the construction site during the construction period.*

(d) Health Impacts: Covid -19 spread

Health Impact- spread of COVID19 among construction workers at work sites. The World Health Organization declared COVID-19 a global pandemic after assessing both its alarming levels of spread and severity, and the alarming levels of inaction. Consequentially, WHO issued various guidance and measures to prevent the spread of the virus. The measures have been adopted worldwide. Similarly, the Kenyan government has since then issued several guidance and directives after the first case was registered on March 13th 2020. These included complete cessation of movement to and from areas considered hot spots and night curfew, social distancing guidelines, closure on non-critical and essential enterprises, closure of places of worship and public gatherings, mandatory use of masks in public places, among others. During project execution (civil works), large numbers of workers will be required to assemble together in meetings, toolbox talks and even at work sites; varied number of workforce including suppliers of material and services are also expected to come in from

various places in the country which may be COVID-19 hot spots; and interaction of workers with the project host community will happen as workers find accommodation close to work sites, and/or return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community. The presence of international workers, especially if they come from countries with high infection rates, may also cause social tension between the foreign workers and the local populations.

Recently, the WHO has warned that the virus is here to stay for a long time and might persist and become our new way. The Government of Kenya has also lifted some of the initial movement controls and allowed the resumption of business, with certain industry specific guidelines being enforced. The duty of care has now been transferred to individual citizens and enterprises. Recognizing the potent risk this may present, it is difficult to clearly outline exhaustive mitigation measures under the mitigation impacts. As such, there is need for the client and the contractor to develop and adopt COVID-19 Standard Operating Procedure (SOPs) in line with the World Bank guidance, Ministry of Health Directives and site-specific project conditions. These SOPs need to be communicated to all workers and enforced to the latter without fail. In addition to the requirement of the SOPs, the following mitigation measure shall also be adopted:

COVID-19 – Mitigation Measures against spread of COVID-19 amongst workers:

- The Contractors will develop SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilizing to site. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;
- Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors;
- Avoid concentration of more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing of at least 2 meters;
- All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs;
- The project shall put in place means to support rapid testing of suspected workers for covid-19;
- Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used;
- Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, doorknobs, handrails etc.;
- Social risk - Spread of COVID-19 amongst community members during consultations

- Efficient and meaningful engagement, a wide range of individual participants, groups in the local community and other stakeholders will be involved. The types of consultations to be used to pass information shall be through public Baraza’s, electronic means shall be used where possible and one-on-one basis meetings while observing the COVID-19 mitigation measures to ensure safety stakeholders involved, the community at large and the client. The consultations will involve verification of PAPs covering the occupants of the affected area and vulnerable persons and groups; awareness raising, sensitization of PAPs and gauging attitude to the project; training and capacity building for livelihoods restoration, grievance redress, and execution of site - specific surveys among others. If carried out conventionally, these activities would lead to close interaction between the proponent and the community members leading to a high risk of spreading COVID-19 amongst community members during the consultation process.
- To minimize the risk of spread of COVID-19 amongst community members, alternative means of consultation will be required as mitigation measures to ensure social distancing and appropriate communication measures. The mitigation measures will be supervised by a communications/ stakeholder engagement / social safeguards expert in the project proponent’s team.

Mitigation measures against spread of COVID-19 amongst community members

- Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;
- Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;
- Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Allow participants to provide feedback and suggestions (iv) Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration. (v) In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chart groups.
- Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants.

(e) Labour influx

During the construction works influx of labour force may cause an increase in illicit behavior, crime and/or perceptions of insecurity by the local community. Such behavior may contribute to insecurity concerns such as theft, physical assaults, substance abuse and prostitution.

Mitigation measures; *The proponent will adhere to national labour code and WB policies through incorporating the same in the Procurement and Contract Agreement document for implementation by the contractor; All workers engaged in the project to be sensitized on the national code of conduct and the World Bank policies; Local community members will be given priority in employment opportunities, in casual and unskilled labour; Train the community on the project requirements and product; The Contractor to ensure that comprehensive data on all workers involved in the project during construction is kept (register of all workers kept on site); and Training of PMC, SAIC, CESSCOs and community policing of the project.*

(f) Risk of social conflict

Conflicts may arise between the local community and the construction workers, which may be related to cultural, or ethnic differences, or based on competition for local resources. Tensions may also arise between different groups within the labor force, and pre-existing conflicts in the local community may be exacerbated.

Proposed mitigation measures will be: The proponent adhere to national labour code and WB policies through incorporating the same in the Procurement and Contract Agreement document for implementation by the contractor; Contractor to sensitize the workers on code of conduct (COC); Develop and implement local hiring rules in consultation and partnership with the local community; and Train workers and the project management committee and rank members on conflict management and resolution.

(g) Child labour

The proposed project will result in increased opportunities for the sale of goods and services to the incoming workers, which can lead to child labor in the production and delivery of such goods and services contributing to absconding of children from schools and increased school dropout rates.

Mitigation measures: *The proponent will sensitize the community on national children welfare policies, children laws and World Bank policies on the protection of children and the importance of children being educated; The Proponent to ensure the Contractor complies with national and WB policies and rules on welfare of children; and Control to ensure there is no child labour at the construction. This can be done by using Identification Cards to verify the age of the workers and casuals.*

(h) 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.

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 will 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 will include how the project will 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, employments 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.

7.3 Potential Environmental and Social Impacts in the Operation Phase

7.3.1 Positive Environmental and social impacts in the operation phase

(a) Flood control, reduced sedimentation & protected river banks

Flash floods are a recurring challenge along River Kanyang’areng to the extent that when its banks burst, it wreaks havoc destroying the farms of maize, beans, sorghum, cowpeas and green grams. The proposed project activities (construction of gabions and groynes/dykes) will result in the prevention and mitigation of flash floods and general flood control of nearby farms as well ensuring containment of the flood water under the Kanyangaren bridge. The project will also reduce sediment transportation and thus minimize bed and bank erosion of river Kanyang’areng and Turkwel dam.

(b) Increased Vegetation Cover

The planned planting of fruit and indigenous trees will improve vegetation cover/reduce surface run -off, improve river bank stability and minimize siltation. It will also increase soil fertility, add biomass and increase ecosystem habitats for living organisms.

(c) Enhanced ecosystem

Once the proposed riverbank protection works has been well established, a variety of flora and fauna will flourish in the riparian area due to conducive habitats.

(d) Increased food and nutrition security

Most of the land in the project area has not been productive due to flooding and soil erosion. The proposed project will solve these problems. After the rehabilitation works the proposed planting of fruit trees and the protection of farm lands will result in increased fruit (paw paws and mangoes) and crop yield (sorghum, cowpeas, green grams, maize, beans) among households in the project area. This will increase food security and nutrition reducing cases of malnutrition especially in the children.

(e) Reduced family conflicts

Increased food production and food security in the project area will lead to family wellbeing due to the readily availability of food. This will translate into reduced wrangles in the family particularly those relating to provision of food in households.

(f) Growth of trading centres

The project will result in the development of infrastructures such as roads. This will attract investment in the area resulting in business growth and the growth of local trading centres such as Ngetut.

(g) Protection of infrastructures

The implementation of the project will result in the protection of essential facilities and infrastructures from flooding. Example is Ngetut and Koderia Primary schools which had been under the threat of being submerged by floods.

(h) Increased Mobility

During rains the bridge at Ngotut usually becomes impassable due to floods. This cuts off Ngotut from the rest of the areas until the floods subside. Movement of people including school children and agricultural produce find it to be impossible. The proposed project activities will result into the flood water passing under the bridge making the road passable at all times.

(i) Increased Livelihoods

Sorghum, green grams, cowpeas, maize and beans are targeted as the crops to promote within the area. This will boost the resident’s source of income, providing an alternative to pastoralism.

(j) Employment creation

The value chain in the crop production to consumption will employ so many households both directly and indirectly. Employment avenues especially to the farming groups and the value chain will be created in the operation phase.

(k) Increased household income

The project will result into an increase in household income from the sale of mango & pawpaw by those households that would benefit from receiving and planting the fruit trees.

Increased agricultural productivity will also result in earning of income by households especially from the sale of horticultural crops.

7.3.2 Negative Environmental Impacts in the Operation Phase

(a) Water Pollution

Due to enhanced farming activities along the river, there is a possibility of agrochemical substances and plant nutrients finding their way into the river. The pollution of the river would lead to the deterioration of water quality, algal blooms, proliferation of aquatic weeds and eutrophication.

Mitigation measures will be: *Training farmers on integrated pest management methods and avoid encroachment to the riparian areas as well as practicing sustainable farming; and Development and implementation of IPMP by the proponent.*

(b) Soil Erosion and continued siltation

Due to increased farming activities in the area, there is a possibility of soil erosion occurring on farms. This can affect agricultural productivity as well as causing siltation in the river

Mitigation measures will include: *Applying sustainable agricultural practices such as construction of soil conservation measures e.g. terraces and cut off drains, planting of grass strip, mulching, practicing conservation agriculture and agroforestry with appropriate riparian vegetation. In addition, farmers will be sensitized and educated on soil erosion control measures. Sensitize the community on importance of the protection and conservation of the riparian area; strengthen the existing water user association through training on the protection and the management of the riparian and the water shed. Development and implementation of watershed management plan.*

7.3.3 Negative Social Impacts during Operation

i) Spread of HIV/AIDS

This can be attributed to increased income generation resultant new businesses, attracting many people, Issues like drug trafficking might be introduced, alcohol and drug abuse, prostitution etc. These vices can lead to increased spread of STDs and HIV/AIDS.

Mitigation measures: *This will involve periodic HIV/AIDS and other communicable diseases awareness workshops by ministry of health; and Creation of awareness to the community on drug and drug abuse by ministry of health and county commissioners’ office through the area chief*

7.4 Decommissioning Phase

This is the formal process of removing something from the operational stage, and it is the final phase in the project cycle. It may present both positive and negative environmental impacts. Decommissioning dykes and gabions do not require much maintenance and its potential destruction, is minimal to the environment if well executed. This involves removal of wires, metal bars used to support the structures, concrete, stones etc. Positive impacts of decommissioning the proposed Kanyang’areng River bank protection works project include: job creation and river bank restoration

The main negative impacts at the phase are mainly losses in the dykes and gabion structures. Other notable negative effects include the generation of demolition waste, noise and vibration generation, air pollution through dust and exhaust emissions and occupational hazards.

CHAPTER EIGHT

ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1 Introduction

The proponent acknowledges the fact that the proposed project activities will have impacts on the environment and socio-economic well-being of the local residents. Thus, the main focus will be on reducing negative impacts and maximizing positive impacts associated with the project activities through a programme of continuous improvement.

The environmental and social management and monitoring plan (ESMMP) involves risk management strategies that should be undertaken by the project proponent and all the stakeholders to mitigate negative environmental and social impacts. This ESMMP thus provides a logical framework within which the environmental issues of social concerns will be mitigated and monitored.

The ESMMP has been developed and outlined to bring home the key findings of the Environmental and social Impact Assessment recommending necessary mitigation actions to improve environmental and social quality. The ESMMP outlined below in table 1 addresses the identified issues of concern (potential negative impacts) and mitigation measures as well as roles, costs and indicators. The ESMMP focuses on all phases of the proposed Kanyang’areng River bank protection project (construction, operational and decommissioning),

8.2 Monitoring and Management

The project will establish both compliance and effects monitoring plans. The compliance monitoring mechanisms will ensure that the various project organizations are implementing the provisions of the ESMMP effectively and on time. The effects monitoring mechanisms will check on the impacts which the project is having on the physical, biological and social environment, by regular measuring of indicators. The results will be fed back to project management for evaluation. During the project preparatory stages, the proponent, Kanyangaren project PMC and the CPCU will ensure that the measures outlined in the ESMMP are complied with. When the construction phase commences, it is expected that a supervising consultant (Engineer) be appointed to ensure compliance of the construction contractor. The project Management Unit through the CESSCO and the Monitoring & Evaluation Officer (MEO) will prepare periodic project compliance reports to the KCSAP CPCU & NPCU and other relevant stakeholders.

8.3 Compliance Monitoring - Operation Phase Monitoring

Periodic preparation of Project Compliance reports will be prepared by the proponent and the MEO, through review of reports and regular site inspections will ensure that the project is implemented in compliance with the ESMMP. The financing partner will mount periodic supervision missions.

8.4 Grievance Redress Mechanism (GRM)

All concerns grievances related to environmental and social performance of the project will be responded in a timely manner by all parties involved. Grievance redress mechanism will be implemented to receive and facilitate of such concerns and grievances. Concerns from the community will be addressed promptly and effectively. The community/ project-affected parties will be informed the about the grievance process in the course of its community engagement activities, and will make publicly available a record documenting the responses to all grievances received; and handling of grievances will be done in an appropriate manner and be discreet, objective, sensitive and responsive to the needs and concerns of the project-affected parties. Project management committee will receive the grievances at the community level, then address it, and if not resolved escalated at the KCSAP office for further resolutions. A complaints box will also be placed strategically for the any community member to access and place complain. The box will be operated and opened weekly by ward Agriculture officer for SAIC or CPCU to address.

Attached is a template of a grievance register available at PMC with SAIC chairman for logging in any concerns raised during implementation and operation phase of the sub-project.

GRM Register

Date	Complainant Name	Name of the sub-project	Ward	Mode	issues of Concern	complainants address status	Response mechanism	Remarks

8.4 Environmental & Social Management & Monitoring Plan (ESMMP) sensitizations

8.4.1 Negative Environmental Impacts During Construction Phase

Environment/Social Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
Disturbance of vegetation	<ul style="list-style-type: none"> • Development and implementation of an afforestation plan in consultation with all stakeholders including the community – already in place. • Support establishment of a community tree nursery for indigenous trees • Sensitization of the labour force against felling trees outside demarcated areas for firewood or sale. • Compensatory planting of trees or other appropriate vegetation after construction works. • Construction workforce to be sensitized on environmental and ecological conservation; and have strict control of construction vehicles to ensure that they operate only within the area to be disturbed by access routes and other works; and avoid cutting down indigenous tree species. 	<p>Area cleared of vegetation</p> <p>Number of tree nursery established.</p> <p>Number sensitization meetings on environmental conservation held</p> <p>NO. of trees to be planted through the afforestation plan</p>	<p>Proponent</p> <p>Supervising engineer/Contractor</p> <p>PMC</p>	<p>M & E reports</p> <p>Engineer’s report</p> <p>Photographs</p>	<p>Once</p>	<p>150,000</p> <p>Tree nursery establishment</p>
Soil Erosion & siltation	<ul style="list-style-type: none"> • Contractor to limit excavation to the marked boundaries of the project site; • Use designated routes for the vehicles to avoid accelerated de vegetation that causes soil erosion; 	<p>Time of excavation</p> <p>Area excavated</p> <p>Designated site for stock pile available</p> <p>Number of</p>	<p>Contractor/supervising engineer</p> <p>Proponent</p> <p>Department of water</p>	<p>Engineers reports</p> <p>Photographs</p> <p>Attendance register</p>	<p>12 months</p>	

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	<ul style="list-style-type: none"> • Clearance of vegetation should wait until the contractor is ready to undertake excavation; and • Excavated earth should be held on locations of the site not susceptible to storm water runoff to avoid siltation of the river. 	compactions runs made Marked routes for vehicles available		Sectoral Field reports CESSCO reports		
Soil compaction	Control construction vehicles to ensure that they operate only within the area marked to be disturbed by access routes and other works to avoid accelerated soil compaction.	Area compacted Cases if vehicles/ machinery operating outside designated routes/ areas	Contractor	Report	12 months- During construction	
Air pollution (Dust and Exhaust emissions)	<ul style="list-style-type: none"> • Any stockpiles of earth (excavated), though little, should be enclosed or covered and watered during dry or windy conditions to reduce dust emissions; • Drivers and machine operators to avoid unnecessary running of engines when not in use; • Dust masks should be provided to all personnel in dust generation areas throughout the period of construction; and • All equipment on site should be properly maintained and in good operating condition so as to emit minimal air pollution. 	Frequency of machinery/ vehicle maintenance No / frequency of water sprays and mists No. of designated hauling/stockpiles areas No of PPEs procured/ Proportion of workers with requisite PPEs No of drivers trained/advised due diligence on machine/vehicle operation	Contractor/Supervising engineer/work foreman NEMA	LPOs Reports Signed contracts between Contractor & employees	12 months	100,000

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<p>Excessive Noise and vibration generation</p>	<ul style="list-style-type: none"> • People working in the construction site should be provided with ear muffles; • Sound-attenuated equipment should be used in as much as possible; Ensure use of equipment with exhaust systems in good working condition should be encouraged so as to reduce the noise levels; and • The equipment should also be regularly serviced and maintained. 	<p>Number of ear muffles purchased. Number of workers using ear muffles. Number of vehicles and machinery not on idling when not in use. Time of operation Frequency of vehicle/ machinery servicing</p>	<p>Contractor/Supervising engineer/work manager</p>	<p>Local purchase orders Reports Receipts Available servicing cards/receipts</p>	<p>12 Months</p>	<p>10,000</p>
<p>Increased solid waste generation</p>	<ul style="list-style-type: none"> • The excavated material shall be recycled; • Minimizing waste generated by adopting cleaner production methods such as conserving raw materials, enabling the recovery and re-use of the waste product where possible; • Use durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time; and • Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements of nature i.e. sunshine, rain etc. 	<p>No of litter bins installed Licensed waste handler in place No of trainings on waste management NO. of bins for handling COVID 19 related wastes such as face masks</p>	<p>Contractor/Project Manager</p>	<p>Receipts Attendance Register Photos</p>	<p>12 months</p>	<p>55,000</p>

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Oil Spills	<ul style="list-style-type: none"> • Proper maintenance of vehicles and other equipment (using petroleum products) to avoid fuels and lubricants spills at the project site; • The contractor should properly handle, storage, and disposal off oils and greases and their wastes during construction by ensuring that servicing is strictly done at designated servicing yard or external petroleum stations; and • Site staff to be sensitized on safety procedures for fuel storage and re-fueling should be well understood and implemented by site staff. 	Designated site for disposal of contaminated materials available Number of sensitization meetings on oil spills held Number of motor vehicle servicing undertaken Number of vehicles serviced	Contractor/supervising engineer	Servicing receipts/cards Reports Attendance registers	12 months	30,000
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8.4.2 Negative Social Impacts During Construction Phase

Environment/Social Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
Occupational Health and Safety (OHS)	<ul style="list-style-type: none"> • The sites to be protected or fenced off from unauthorized intrusions and warning signs; barricades should be properly displayed and strictly adhered to; • All workers to be provided with full protective gear (PPEs) and to use them; • Workers to be trained on first aid & a fully equipped First Aid Kit provided at site; 	<ul style="list-style-type: none"> • No of Labels and warning signs installed • No of workers using PPEs • No of staff/ workers trained on first-aid • No of First-aid Kits installed • No of incidences/ accidents reported 	Contractor/Supervising engineer/work foreman Work foreman Directorate of Occupational Health and Safety (DOSH)	Purchase receipts Reports Attendance register Records of testimonials of drivers	12 months	50,000

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	<ul style="list-style-type: none"> • The contractor to have Incident and Accident Registers on site for recording of injuries or any OHS incidence; • Contractor to prepare an emergency management and preparedness plan for accident response & avail Emergency contacts for police, ambulance, etc.; • Contractor to appoint a qualified health and safety person to manage OSH issues; and Tools and equipment to be placed in a safe place when not in use. 	<ul style="list-style-type: none"> • NO. of emergency plan for accident response in place • Emergency contacts at the site • No of persons insured 				
Increased traffic flow & Risk of Accidents to the community	<ul style="list-style-type: none"> • Contractor to sensitize the community on the project and the project period and what caution to be taken by the community; • Contractor to employ qualified drivers; • Drivers to be instructed to observe required speed limits and Installation of warning sign boards at the construction site and identified risk areas. • The direction of vehicles movement and road signs i.e. “construction in progress” shall be clearly indicated. Someone shall be 	<ul style="list-style-type: none"> • Number of drivers instructed • No. of signage in identified risk areas • No. of community sensitizations on project implementation, risks and safety measures 	Contractor/Supervising engineer	Photographs Attendance register Site visits	12 months	15,000

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	assigned to control traffic					
Increase in incidences of HIV/AIDS and STIs	<ul style="list-style-type: none"> • Contractor to sensitize workers and community members on HIV/AIDS and other communicable diseases. • Contractor’s Health and Safety Management Plan (CHSMP) to be enforced through the Directorate of Occupational Health & Safety (DOSHS); • Controlled access to Contractor’s Workforce Camps by outsiders; and Contractor to provide standard quality condoms at the construction site during the construction period. 	<ul style="list-style-type: none"> • Number of worker and community sensitized on HIV /AIDS • No of condom dispensing equipment installed • Number of meetings held for workers and community on HIV/AIDS awareness 	Contractor Proponent Public Health	Attendance registers Site visits	12 months	50,000
Spread of COVID-19 amongst construction workers	<ul style="list-style-type: none"> • The Contractor will develop SOPs for managing the spread of Covid-19 during project execution in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions; • Mandatory provision and use of appropriate PPE) shall be required for all project personnel including workers and visitors; • Concentration of more than 15 people in a location to be avoided; Maintain social distancing of at least 1.5 meters 	<ul style="list-style-type: none"> • No of SOP(s) developed, • No of training material developed, • No of PPE purchased and used, • No of installed handwashing equipment installed. 	All the Project components Supervising Eng. & Contractor(s)	SOPs Project assessment reports Purchase orders/receipts Photos	12 months	50,000

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	<p>where two or more people gathered;</p> <ul style="list-style-type: none"> • Subject workers and other people visiting the site to rapid Covid-19 screening which may include temperature check and other vital signs; • Install hand-washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings; and • Ensure routine sanitization of shared social facilities 					
<p>Spread of COVID-19 amongst community members during consultation sessions</p>	<ul style="list-style-type: none"> • Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced; • Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters; 	<ul style="list-style-type: none"> • No of SOP(s) developed, • No of training material developed, • No of PPE purchased and used, • . • 	<p>proponent Supervising Eng. & Contractor(s)</p>	<p>SOPs Project assessment reports Purchase orders/receipts Photos</p>	<p>2 months</p>	<p>50,000</p>

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	<ul style="list-style-type: none"> ● The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet; ● Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Allow participants to provide feedback and suggestions (iv) Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration. (v) In situations where online interaction is challenging, disseminate information through digital platform (where available) like 					
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ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

	<p>Facebook and WhatsApp & Chart groups.</p> <ul style="list-style-type: none"> • Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants. 					
Labour risks including labor influx	<ul style="list-style-type: none"> • The proponent adherence to national labour code and WB policies through incorporating the same in the Procurement and Contract Agreement document for implementation by the contractor; All workers engaged in the project to be sensitized on the national code of conduct and the World Bank policies; • Local community members will be given priority in employment opportunities, in casual and unskilled labour; • Train the community on the project requirements and product; • The Contractor to ensure that comprehensive data on all workers involved in the project during construction is kept (register of all workers kept on site); and • Training of PMC, SAIC, 	<ul style="list-style-type: none"> • Number of trainings for PMC, SAIC, CESSCOs and Community policing of the project • NO. of community members trained on project requirements • No of locals employed as a proportion of the overall labor force 	Contractor/ Proponents Supervising Engineer	Training reports Workers register local administration report on GBV incidences monitoring, assessment	12 months	50,000

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

	CESSCOs and community policing of the project					
Child labour	<ul style="list-style-type: none"> The proponent to sensitize the community on national children welfare policies, children laws and World Bank policies on the protection of children and the importance of children being educated; The Proponent to ensure the Contractor complies with national and WB policies and rules on welfare of children; and Control to ensure there is no child labour at the construction. This can be done by using Identification Cards to verify the age of the workers and casuals. 	<ul style="list-style-type: none"> -No. of sensitizations on children welfare -No of registered workers -No of workers who have signed the code of conduct 	CPCU	Signed agreements attendance registers copies of ID. Card No. of workers	12 months	10,000
Gender-based Violence (GBV)	<ul style="list-style-type: none"> The contractor will develop an appropriate code of conduct for his workers and sensitize them on GBV Proponent to sensitize the community on GBV and facilitate the development of an appropriate grievance redress mechanism that includes the local leadership 	<ul style="list-style-type: none"> Code of conduct prepared No of sensitizations on GBV held for the workers No of community members sensitized No of grievances received and resolved 	contractor GBV Expert proponent	GBV plans developed Attendance registers GBV action plans	12 months	30,000

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

<p>Sexual Exploitation and Abuse</p>	<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 will 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 will include how the project will 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 	<ul style="list-style-type: none"> • Code of Conduct developed • Number of staff trainings on SEA conducted • SEA FP • Community Liaison trained in PSEA • IEC materials for workers’ sites and community 	<p>contractor proponent</p>	<p>SEA action plans developed Attendance registers</p>	<p>12 months</p>	<p>70,000</p>
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	<p>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 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 					
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ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

	<p>integration of SEA in job descriptions, employments 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.</p>					
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8.4.3 Environmental Impacts during Operations Phase

Environment/Social Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
Water pollution	Training farmers on integrated pest management (IPM) methods and avoid encroachment to the riparian areas as well as practicing sustainable farming; and	NO. of IPMP developed & implemented NO. of farmers	CPCU Agriculture department WRA	Reports Attendance	Quarterly	100,000

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

	Development and implementation of IPMP by the proponent.	trained on IPM				
Soil erosion & Siltation	Applying sustainable agricultural practices such as construction of soil conservation measures e.g. terraces and cut off drains, planting of grass strip, mulching, practicing conservation agriculture and agroforestry with appropriate riparian vegetation. In addition, farmers will be sensitized and educated on soil erosion control measures. Sensitize the community on importance of the protection and conservation of the riparian area; strengthen the existing water user association (WUA) through training on the protection and the management of the riparian and the water shed. Development and implementation of watershed management plan.	NO. of sustainable agricultural practices implemented NO. of community members sensitized On riparian protection and conservation NO. of watershed management plans developed and implemented NO of WUA sensitized	Proponent Contractor Dept. of Livestock and agricultural officers Proponent Community in catchment area	Designs & BQs Reports Photographs Attendance Registers Training manuals	Annually	150,000

8.4.4 Social Impacts during Operations Phase

Environment/Social Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
Spread of HIV/AIDS	Conduct periodic HIV/AIDS and other communicable diseases awareness workshops Creation of awareness to the community on drug and drug abuse	NO. of people sensitized on HIV/AIDS and drugs abuse	CPCU Chiefs Project management committee ministry of health	Training reports Attendance Photos	quarterly	30,000
Safety, Health and	Development & implementation of	NO. of IPMP	CPCU	Reports	Quarterly	30,000

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

Occupational Concerns	Integrated Pesticide Management Plan (IPMP)	developed & implemented	Proponent Department of Agriculture			
Spread of COVID-19 amongst workers	<ul style="list-style-type: none"> ○ The Contractor will develop a SOPs for managing the spread of Covid-19. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives, and site-specific project conditions. ○ Mandatory provision and use of appropriate Personal Protective Equipment (PPE) ○ Avoid concentrating of more than 15 workers at one location. ○ Maintain social distancing at least 2 meters. ○ All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs. ○ The project shall put in place means to support rapid testing of suspected workers for covid-19. 	<p>Availability of:</p> <p>SOP(s), Training material, PPE, Sanitizing facilities, Installed handwashing equipment</p>	<p>All the Project components Supervising Eng. & Contractor(s)</p>	<p>SOPs, Project assessment reports, Purchase orders/receipts, Photos</p>	<p>monthly</p>	<p>30,000</p>

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

	<ul style="list-style-type: none"> ○ Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used. <p>Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, doorknobs, handrails etc.</p>					
<p>Risk of Spread of COVID-19 amongst community members during consultations processes</p>	<ul style="list-style-type: none"> ○ Electronic means of consulting stakeholders and, holding meetings, whenever possible, shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced. ○ Avoid concentrating of more than 15 community members at one location. ○ Maintaining social distancing at least 2 meters ○ The team will be provided with appropriate PPE such as masks 	<p>Availability of SOP(s), Training material, PPE, sanitizing facilities</p> <p>Availability of SOP(s), Training material, PPE, sanitizing facilities</p> <p>No. of participants registered online.</p> <p>Evidence of use of electronic media for information dissemination/engage</p>	<p>All the Project components</p> <p>Supervising Eng. & Contractor</p> <p>Communication / stakeholder engagement expert in the Team</p>	<p>Purchasing orders, Receipts</p>	<p>Monthly</p>	<p>20,000</p>

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

	<p>for them and for the number of people they intend to meet.</p> <ul style="list-style-type: none"> ○ Hold meetings in small groups, mainly in form of FGDs ○ Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants. 	<p>ment e.g., printed electronic mails, addresses of video links created etc</p>				
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 will 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>SEA Action Plan Code of Conduct Number of staff trainings SEA FP Community Liaison trained in PSEA IEC materials for workers’ sites and community Discrete SEA reporting pathway</p>	Contractor GBV Expert	SEA action plan Attendance registers	1 month	20,000
Gender-based Violence (GBV) at the community level	<ul style="list-style-type: none"> ○ The contractor will implement provisions that ensure that GBV at the community level is not triggered by the Project, including: ○ Effective and on-going 	<p>Number of SEA action plans prepared Code of conduct prepared Number of staff trainings on SEA held.</p>	Supervision Consultant GBV Expert	GBV plans Attendance registers GBV action plans	1 month	30,000

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

	<p>community engagement and consultation, particularly with women and girls;</p> <ul style="list-style-type: none"> ○ Review and updating of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; delivery of water supplies; etc. 	<p>-Number of PSEA community liaison trainings carried out</p> <p>Number of IEC materials available</p>				
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8.4.5 Environmental and Social Impacts during Decommissioning

Environment/Social Impact	Proposed Mitigation Measure	Monitoring Indicator	Responsibility	Means of Verification	Time Frame	Estimated cost (Kshs)
Demolition waste	<p>Use of an integrated waste management system for solid wastes through: Reduction; Reuse and Recycling.</p> <p>Use of NEMA registered waste handler</p> <p>Provide waste receptacles at demolition site</p>	<p>Volume of waste generated</p> <p>NO. of registered waste handler used</p> <p>NO. of waste receptacles</p>	<p>Contractor/supervising engineer</p> <p>Proponent</p>	<p>Reports</p>	<p>Throughout demolition period</p>	<p>100,000</p>
Vegetation disturbance	<p>Implement appropriate re-vegetation program to restore the site to its original</p>	<p>Area planted with vegetation</p>	<p>Contractor/supervising engineer</p>	<p>Reports</p>	<p>Throughout demolition</p>	<p>50,000</p>

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

	status. Consider use of indigenous plant species in re-vegetation	NO. of riparian trees/ vegetation planted	Proponent		period	
Increased occupational health and safety risks	Provision of appropriate personal protective equipment as well as ensuring a safe and healthy environment for demolition workers.	NO. of workers using PPEs NO. of PPEs purchased	Contractor/supervising engineer Proponent	Purchase receipts	Throughout demolition period	5,000
Noise and vibration	Sensitize demolition vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used. Sensitize demolition drivers to avoid hooting especially when passing through sensitive areas such as hospitals and schools. Ensure that demolition machinery is kept in good condition to reduce noise and vibration generation.	NO. of drivers sensitized	Contractor/supervising engineer Proponent		Throughout demolition period	factored
TOTAL						1,465,000

CHAPTER NINE CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

This assessment has ascertained that the construction of the proposed Kanyangareng River Rehabilitation Sub-project will be on a riparian land and therefore there shall be no restriction to access to the project site. The project will have both positive and negative impacts on the physical and the surrounding human environment. Positive impacts include flood control, soil erosion and siltation control, employment creation, riparian protection and conservation, improved agricultural productivity, among others. The negative impacts include noise and dust pollution, disturbance of vegetation water pollution, soil erosion, socio-economic impacts such increase in communicable diseases such as HIV/AIDS, COVID 19, child labour, GBV/SEA issues among others. The project design has integrated measures to mitigate negative impacts with a view to ensuring compliance with applicable laws and procedures. Additional and more detailed measures are provided in the ESMMP and will help in mitigating the impacts. Overall, the ESIA study concludes that the sub project will **not** generate significant negative impacts that can compromise the ecological and environmental wellbeing of the area as well as health and safety of the residents.

9.2 Recommendations

It is thus recommended that the proposed project proponent be allowed to go ahead provided the outlined mitigation measures are implemented to as outlined in the ESMMP. The ESMMP should be shared with the Contractor and the same should be required translate this ESMMP into and implement Contractor-Specific Environmental and Social Management Plan (CESMP). The contractor will also be required to employ a qualified Environmental and Social Safeguards specialist to oversee implementation of the ESMP. On approval, it is recommended that the proponent should implement the proposed project based on the proposed plans and if alterations are necessary, advice should be sought from the CESSCO, subsequently environmental expert and County NEMA director. The proponent will be required to undertake annual environmental audits pursuant to the provisions of the Act.

REFERENCES

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- 2.] Hydrological Survey Report for the proposed Kanyang’areng River Bank protection works
- 3.] Republic of Kenya (2004), State of Environment Report, NEMA, Nairobi
- 4.] Republic of Kenya (2004), District Environment Profile, NEMA, Nairobi
- 5.] Republic of Kenya, District Development plan, 2002-2008, Government Printer, Nairobi
- 6.] Republic of Kenya, Environmental Management and Coordination Act no. 8 of 1999, Government Printer, Nairobi
- 7.] Republic of Kenya, Water Act (2002), Government Printer, Nairobi
- 8.] Republic of Kenya, Factory and Other Places of Work Act, Cap 514. Government Printer, Nairobi
- 9.] Republic of Kenya, Public Health Act, Cap 242, Government Printer, Nairobi.
- 10.] Republic of Kenya, Environmental audit/Audit Regulations 2003, (Legal Notice No.101) Government Printer, Nairobi.
- 11.] Republic of Kenya, Legal Notice 31: Factories and Other Work Places (Safety and health Committees) Rules, 2004, Government Printer, Nairobi
- 12.] UNEP and ACTS (2001), Making of Framework Environmental

ANNEXES

Annex 1: Screening Checklist

Annex 12A: Environmental and Social screening Check list
ESM Sub-projects Screening Checklist (Prototype)
 (Sub-projects screening process by benefitting communities/Agencies)

Section A: Background information

Name of County: West pokot county

Name of CPCU /Researcher: West County project coordinator Philip Tingaa

Sub-project location: Kapchok ward

Name of CBO/Institution:

Postal Address: Kapchok ward

Contact Person: Philip Tingaa Cell phone: 0722 600096

Sub-project name: Kanyang'areng River Bank protection works

Estimated cost (KSh): 24,000,000

Approximate size of land area available for the sub-project: 5.8 aas

Objectives of the sub project: Reduce land degradation, improve income, food security, livelihood

diversification through availability water

Activities/enterprises undertaken: Vegetative guards, green grass

How was the sub-project chosen? Through consultative meetings with the community

Expected sub project duration: 3 months

Section B: Environmental Issues

Will the sub-project:	Yes	No
Create a risk of increased soil erosion?		✓
Create a risk of increased deforestation?		✓
Create a risk of increasing any other soil degradation soil degradation?		✓
Affect soil salinity and alkalinity?		✓
Divert the water resource from its natural course/location?		✓
Cause pollution of aquatic ecosystems by sedimentation and agro-chemicals, oil spillage, effluents, etc.?		✓
Introduce exotic plants or animals?		✓
Involve drainage of wetlands or other permanently flooded areas?		✓



Cause poor water drainage and increase the risk of water-related diseases such as malaria?		✓
Reduce the quantity of water for the downstream users?		✓
Result in the lowering of groundwater level or depletion of groundwater?		✓
Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater?		✓
Reduce various types of livestock production?		✓
Affect any watershed?		✓
Focus on Biomass/Bio-fuel energy generation?		✓

If the answers to any of the above is 'yes', please include an EMP with sub-project application.

Section C: Socio-economic Issues

Will the sub-project:	Yes	No
Displace people from their current settlement?		✓
Interfere with the normal health and safety of the worker/employee?		✓
Reduce the employment opportunities for the surrounding communities?		✓
Reduce settlement (no further area allocated to settlements)?		✓
Reduce income for the local communities?		✓
Increase insecurity due to introduction of the project?	✓	
Increase exposure of the community to HIV/AIDS?	✓	
Induce conflict?	✓	
Have machinery and/or equipment installed for value addition?		✓
Introduce new practices and habits?		✓
Lead to child delinquency (school drop-outs, child abuse, child labour, etc.)?		✓
Lead to gender disparity?		✓
Lead to poor diets?		✓
Lead to social evils (drug abuse, excessive alcohol consumption, crime, etc.)?	✓	

Section D: Natural Habitats

Will the sub-project:	YES	NO
Be located within or near environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species?	✓	
Adversely affect environmentally sensitive areas or critical habitats – wetlands, woodlots, natural forests, rivers, etc.)?	✓	
Affect the indigenous biodiversity (Flora and fauna)?	✓	

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KCSAP Kenya Climate-Smart Agriculture Project

Cause any loss or degradation of any natural habitats, either directly (through project works) or indirectly?	✓	
Affect the aesthetic quality of the landscape?	✓	
Reduce people’s access to the pasture, water, public services or other resources that they depend on?		✓
Increase human-wildlife conflicts?		✓
Agrochemical use		
Will the sub-project:		
Involve the use of pesticides or other agricultural chemicals, or increase existing use?		✓
Cause contamination of watercourses by chemicals and pesticides?		✓
Cause contamination of soil by agrochemicals and pesticides?		✓
Experience effluent and/or emissions discharge?		✓
Export produce? Involve annual inspections of the producers and unannounced inspections?		✓
Require scheduled chemical applications?		✓
Require chemical application even to areas distant away from the focus?		✓
Require chemical application to be done by vulnerable group (pregnant mothers, chemically allergic persons, elderly, etc.)?		✓
Use irrigation system in its implementation?		✓

If the answers to any of the above is ‘yes’, please include an EMP with sub-project application.

Section E: Pesticides and Agricultural Chemicals

This questionnaire will be used with the farmers groups for purpose of implementing the IPMF

1) Pest Control practices

a) Do you use any pesticides to control pests (Insects, diseases, weeds) of crops each season?

Yes _____ No _____ If yes, Name them:	Name of pesticide	Name of pest, disease, weed controlled	Number of times applied/season	When did you apply (growth stage or month) Quantity purchased

If No, WHY?

b) If you use any of the above pesticide types, do you keep records of the:

Section F: Vulnerable and Marginalized Groups meeting requirements for OP 4.10

Are there:	Yes	NO
People who meet requirements for OP 4.10 living within the boundaries of, or near the project?		✓
Members of these VMGs in the area who could benefit from the project?		✓
VMGs livelihoods to be affected by the sub project?		✓

If the answer to any of the above is 'yes', please consult the VMGF that has been prepared for the project.

Section G: Land Acquisition and Access to Resources

Will the sub-project:	Yes	No
Require that land (public or private) be acquired (temporarily or permanently) for its development?		✓
Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)		✓
Displace individuals, families or businesses?		✓
Result in temporary or permanent loss of crops, fruit trees and pasture land?		✓
Adversely affect small communal cultural property such as funeral and burial sites, or sacred groves?		✓
Result in involuntary restriction of access by people to legally designated parks and protected areas?		✓
Be on monoculture cropping?		✓

If the answer to any of the above is 'yes', please consult the mitigation measures in the ESMF, and if needed prepare a (Resettlement Action Plan) RAP.

Section H: Proposed action

(i) Summarize the above:	(ii) Guidance
All the above answers are 'No' There is at least one 'Yes' ✓	<ul style="list-style-type: none"> • If all the above answers are 'No', there is no need for further action; • If there is at least one 'Yes', please describe your recommended course of action (see below).

(iii) Recommended Course of Action

If there is at least one 'Yes', which course of action do you recommend?


✓ CPCUs and County Director of Environment (CDE) will provide detailed guidance on mitigation measures as outlined in the ESMF; and Specific advice is required from CDE and CPCUs regarding sub-project specific EIA(s) and also in the following area(s)

All sub-project applications/proposals MUST include a completed ESMF checklist. The KCSAP-CPCU and CDE will review the sub-project applications/proposals and the CDEs will sign off; The proposals will then be submitted to NPCU for clearance for implementation by communities in the proposed subprojects.


Expert Advice


The National Government through the Department of Monuments and Sites of the National Museums of Kenya can assist in identifying and, mapping of monuments and archaeological sites; and Sub-project specific ESIA's, if recommended, must be carried out by experts registered with NEMA and be followed by monitoring and review. During the process of conducting an EIA the proponent shall seek views of persons who may be affected by the sub-project. The WB policy set out in OP 4.01 requires consultation of sub-project affected groups and disclosure of EIA's conclusions. In seeking views of the public after the approval of the sub-project, the proponent shall avail the draft ESIA report at a public place accessible to project-affected groups and local NGOs/CSOs.

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

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Completed by: [type here] *Langirodau Lotar 4*
Name: [type here] *Chairman Management committee*
Position / Community: [type here] *Ngatut Village*

Date: [type here] 

Field Appraisal Officer (CDE): [type here]
Signature: / 
COUNTY DIRECTOR OF ENVIRONMENT
WEST POKOT COUNTY
P. O. BOX 115 - 35100, KAPEMBURWA
Email: westpokot@env.go.ke
Web: www.env.go.ke

Date: [type here] *27th February 2019*

Annex 2: Sample Filled in Individual Questionnaires

1

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED KANYANG'ARENG RIVERBANK PROTECTION PROJECT AT WEST POKOT COUNTY

SUB-COUNTY: Pokot/NORTH WARD: KAPCHOK PLOT NUMBER: LOCATION: LODIM SUB-LOCATION: KADULEM

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the

- Are you a resident of the proposed project area? Yes [] No []
- How far is your place of residents from the proposed project area? 3 Km
- For how long have you resided in this area? 20 YEARS
- Are you aware of the proposed project? Yes [] No []
- a) do you anticipate any conflict or complains against the project with respect to:
 - land/soils Yes [] No []. If yes indicate close of the land if falls to restricted cultivate
 - water Yes [] No []. If yes indicate
 - Human health/Life Yes [] No []. If yes indicate
 - loss of life Yes [] No []. If yes indicate
 - wild life Yes [] No []. If yes indicate
 - air quality Yes [] No []. If yes indicate
 - culture and religion Yes [] No []. If yes indicate
 - education Yes [] No []. If yes indicate

b) If any in 5(a) above is yes how well could they be mitigated? When ever restricted or allianated from cultivation to be considered in the project to earn

- In your view,
 - What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife, etc) do you anticipate from the project at all phases (construction, operation and decommissioning phase)?

1. N. Gutut bridge that it is in danger of water sweeping will be save, seedling water from the river / floods will be controlled under right water channels, farms around N. Gutut primary school approached by the river Kanyangareng banks will be save from drawing
 - What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife, etc) do you anticipate from the project at all phases (construction, operation and decommissioning phase)?

1. many trees around the banks that was used for bee hives hanging will be lose hence no honey to sell
 - How can the negative impacts be mitigated? The res is little to do but the project is of highest significance to the people around
- Should the project be implemented? Yes [] No []
- If no, why?
- Respondent Name: John Basse ID No/phone:
No: 23456789 sign: [Signature] date: 14/5/2021

THANK YOU FOR YOUR COOPERATION

1

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

STAKEHOLDERS’ PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED KANYANG’ARENG RIVERBANK PROTECTION PROJECT AT WEST POKOT COUNTY

SUB-COUNTY: Pokot North WARD: Kapchok PLOT NUMBER: LOCATION: LOC 7 SUB-LOCATION: Kodulom

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the

1. Are you a resident of the proposed project area? Yes No
2. How far is your place of residents from the proposed project area?
3. For how long have you resided in this area?
4. Are you aware of the proposed project? Yes No
5. do you anticipate any conflict or complains against the project with respect to:
 - land/soils Yes No If yes indicate
 - water Yes No If yes indicate
 - Human health/Life. Yes No If yes indicate
 - loss of life Yes No If yes indicate
 - wild life Yes No If yes indicate
 - air quality Yes No If yes indicate
 - culture and religion Yes No If yes indicate
 - education Yes No If yes indicate
- b) If any in 5(a) above is yes how well could they be mitigated?
6. In your view.
 - a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
improve Energy and life standard, improve Agriculture for both Animal and plant husbandry.
 - b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases(construction, operation and decommissioning phase)?
Exclusion of resources.
 - c) How can the negative impacts be mitigated?
proper management of resources.
7. Should the project be implemented? Yes No If no, why?
8. Respondent Name: NEMBA LODON ID No/phone No: 0757744519 date: 14/05/2021

THANK YOU FOR YOUR COOPERATION

2

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED KANYANG'ARENG RIVERBANK PROTECTION WORKS PROJECT AT WEST POKOT COUNTY

SUB-COUNTY West pokot WARD Kapchok PLOT NUMBER..... LOCATION..... SUB-LOCATION Kaducuma

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the

1. Are you a resident of the proposed project area? Yes [], No [].
2. How far is your place of residents from the proposed project area?
3. For how long have you resided in this area?
4. Are you aware of the proposed project? Yes [], No [].
5. do you anticipate any conflict or complains against the project with respect to:
 - land/soils Yes [], No []. If yes indicate.....
 - water Yes [], No []. If yes indicate.....
 - Human health/Life Yes [], No []. If yes indicate.....
 - loss of life Yes [], No []. If yes indicate.....
 - wild life Yes [], No []. If yes indicate.....
 - air quality Yes [], No []. If yes indicate.....
 - culture and religion Yes [], No []. If yes indicate.....
 - education Yes [], No []. If yes indicate.....

b) If any in 5(a) above is yes how well could they be mitigated? difficult

6. In your view, a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases (construction, operation and decommissioning phase)?

easy adaptation of rural and services
to increase the productivity of community economic
to increase livestock production

b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife,etc) do you anticipate from the project at all phases (construction, operation and decommissioning phase)?

pollution of streams due to human dig

c) How can the negative impacts be mitigated?

to control the human dig

7. Should the project be implemented? Yes [], No []. If no, why? paper work

8. Respondent Name Philip ID No/phone No 0722529850 date 16/5/2021

THANK YOU FOR YOUR COOPERATION

5

STAKEHOLDERS' PERCEPTIONS ON THE POTENTIAL SOCIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED NANYANG'ARENG RIVER BANK PROTECTION PROJECT AT NG'ARIT COUNTY

SUB-COUNTY N. POKOT WARD KAPCHOK PLOT NUMBER N/A LOCATION LAIAM SUB-LOCATION KADULIEMA

This project is anticipated to have effects on the physical, biological and socio-economic environments of the surrounding area and the community. It is important, therefore, to determine these impacts and public participation is a requirement of Environmental Management and Coordination Act, 1999 (Section 58 on Environmental Impact Assessment) in this process. Therefore, as a key stakeholder (i.e. local leader/ surrounding institution or organization/ interested person or group), we request for your comments on the potential socio-economic and environmental impacts of the

1. Are you a resident of the proposed project area? Yes [], No []
2. How far is your place of residents from the proposed project area? 8 km
3. For how long have you resided in this area? 21
4. Are you aware of the proposed project? Yes [], No []
5. a) do you anticipate any conflict or complains against the project with respect to:
 - land/soils Yes [], No []. If yes indicate YES
 - water Yes [], No []. If yes indicate NO
 - Human health/Life Yes [], No []. If yes indicate NO
 - loss of life Yes [], No []. If yes indicate NR
 - wild life Yes [], No []. If yes indicate NR
 - air quality Yes [], No []. If yes indicate NO
 - culture and religion Yes [], No []. If yes indicate NO
 - education Yes [], No []. If yes indicate NO

b) If any in 5(a) above is yes how well could they be mitigated? Prevent the loss by building gabions on both sides

6. In your view,
 - a) What are the **Positive** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife, etc) do you anticipate from the project at all phases (construction, operation and decommissioning phase)?
 - Save jobs
 - Road will be passable
 - Food production will increase
 - b) What are the **Negative** socio-economic and environmental impacts (i.e. to people, land/soil, water, forest, air, wetlands, livestock, wildlife, etc) do you anticipate from the project at all phases (construction, operation and decommissioning phase)?
 - Same will happen land due to erosion
 - Scramble for land

c) How can the negative impacts be mitigated? Keep animals (more)
Plant trees and bee keeping

7. Should the project be implemented? Yes , No [].
If no, why?
8. Respondent Name Mika chepo ID No/phone 37232736
No. 0728527898 sign. [Signature] date

THANK YOU FOR YOUR COOPERATION

Annex 3: Minutes of Public Baraza and Stakeholders Consultation

RIVER KANYANGARENG PROTECTION COMMUNITY PARTICIPATION FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT MEETING HELD ON 27.04.2021 AT KANYANGARENG

MEMBERS PRESENT *(Refer to attendance register for full list)*

	Name	Designation	Contact
1	Peter Lokedi	Community member	0706676973
2	John lotokori	Community member	0703737205
3	Philip Komole	Community member	0741757702
4	Simon Lomerinyang	Community member	0714271736
5	Lokwaris Longuramuk	Community member	0791746902
6	David Kiptoo	Community member	0743496660
7	Daniel Limaris	Community member	0742943188
8	Samwel Riwale	Community member	0741366487
9.	Alex Lodow	Community member	0741113089
10	Chepurai Rabecca	Community member	
11	Abraham Cherume	Community member	
12	William Lotem	Community member	0795332698
13	Musa Losili	Community member	0795494266
14	Luka Komole	Community member	0728349307
15	Thomas P. Lotongar	Ass/Chief	0729493148
16	Agneta Aaleyo	Smart Agriculture dpt	0723690718
17	Willy Kiproop	Smart Agriculture dpt	0720936905
18	Raphael Magal	ESIA expert	0735380746
19	Edwin Pkemei	ESIA expert	0722814583

AGENDA

1. **Environmental and social impact assessment community participation meeting.**
2. **A.O.B**

MIN 01/27/4/2021: PRELIMINARIES

The meeting was called to order by the chairperson at 2.30pm and the opening prayer was conducted by one member. Area chief (Chairing) then welcome all the members and thanked them all for attending the meeting after a short notice, He further said that it will be beneficial to work together as a community towards success of the Kanyangareng river protection project. The chair also reiterated that time and again during long rains the Kanyangareng Bridge has been nightmare to cross due to overflow and siltation. This is

majorly as a result of farming along the riverine beyond recommended section. He further encouraged members present to represent the rest by deliberating freely on the day’s agenda.

MIN 02/27/4/2021: INTRODUCTION OF MEMBERS PRESENT

The chair requested the members from office of smart Agriculture and consultancy team present to introduce themselves and also mention their department. After completion of introduction session, the chair further emphasized that as we sit for the meeting every person present should maintain social distance as per the ministry of health regulation to curb COVID-19 pandemic. He further said that only maximum of ten (15) people of your choice will only be allowed to represent the rest of the community members during discussion. All community members accepted the request and complied with it effective fully. Since there was no previous meeting minutes the members went straight to the day’s agenda.

MIN 03/27/4/2021: ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROPOSED PROJECT

The officer from the agriculture department did a brief explanation for the meeting. He also reminded the community that doing agriculture is good, but it should observe environmental conservation. He said that human activities are the primary cause of the river changing its course in River Kanyangareng. He also informed community members to do correct farming practice as they were thought by agriculture officers. He further said destruction along the river bank has been the main reason for the river to changing its course. He encouraged all members to participate fully in the project to correct mistakes and conserve the river. The officer said that about Ksh 24 million funds are available to improve production, building of gabions, terraces, and planting of trees. The officer then invited the E.S.I.A team to take over.

One of the expert team member posed a question to the local members of the community if they were conversant with what it entails when environmental and social impact is undertaken. In their response only a few members had clue of what it is. This prompted the consultancy team to elaborate more to ensure that everyone understands what it is and its benefits before project implementation. The explanation made resulted in community representative giving out crucial details of information necessary for the preparation of the Environmental report. Some of the important details collected from the meeting were.

1. Community members confirmed that they have been having a challenge to cross the bridge at Kanyangareng connecting Konyao and Kiwawa mainly during long rains season because of water logging. They claimed that over year’s siltation and change of river course has been witnessed. They further said that they have lost crops due to floods. This was evident as from observation they practiced farming upto the river banks.
2. One member said that they like to extend the farming to the river rine because of fertile alluvial soil.
3. All community members unanimously confirmed that they clear bushes completely along the bank to keep off notorious pests and wild animals that destroy their crops. Some of the stubborn wild animals include Monkeys, Baboons, antelopes, warthogs, porcupines, squirrels, rats and wild birds.

4. One of the member observed that since the construction of Turkwel dam some years back they have been witnessing change of river course, flooding hence they also attribute some of this problem of flooding due to the siltation of Turkwel dam. This has also resulted in some of the reptiles like crocodile moving upstream due to conducive environment.
5. The community is interested in growing of both food crops and fruit trees like maize, beans, cassava, sweet potatoes, French beans, green grams, ground nuts, bananas, mangoes, avocados, pawpaw, oranges, sugarcanes, tomatoes, vegetables, watermelon etc.
6. All community members unanimously agreed that they are in support of the proposed Kanyangareng river conservation and are ready to practice sound agricultural practice. They further said that the project will bring more good than what they are doing now hence they are eagerly wait for the project to commence.
7. It was confirmed from the meeting that the parcel of land for the proposed project is community owned hence official documentation for the ownership were not available.
8. The proposed project will benefit many farmers from both sides of the river. The total numbers of beneficiaries are 276 farmers cultivating of about 500 acres.

MIN 04/27/04/2021 ANALYSIS OF BOTH POSITIVE AND NEGATIVE IMPACTS FOR THE PROPOSED PROJECT
POSITIVE IMPACTS

These were enumerated as follows:

- ✓ Employment Creation
- ✓ Provision of Market for Supply of Building Materials
- ✓ Alternative Improved Livelihood
- ✓ Increased Vegetation Cover
- ✓ Improved nutrition.
- ✓ Enhanced riverbanks
- ✓ Increased productivity
- ✓ Enhanced ecosystem services
- ✓ Maximum land use

NEGATIVE IMPACTS

These were enumerated as follows:

- ✓ Vegetation Loss
- ✓ Increased soil erosion
- ✓ Soil Compaction
- ✓ Dust emissions
- ✓ Exhaust emissions
- ✓ noise and Vibration
- ✓ Increased water demand
- ✓ Increased solid waste generation
- ✓ Oil Spills

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

- ✓ Risks of accidents and injuries to workers

MIN 05/27/04/2021 AOB

One community member requested that the County Government should implement the project sooner

MIN 06/27/04/2021 ADJOURNMENT

There being no other business, the meeting ended at 4.00pm with a prayer from Chepurai

Minutes prepared by Secretary

Name: Walia Chemah.....Sign: [Signature].....
Date: 27/4/2021.....

Minutes Confirmed by Chair

Name: Lore Odite.....Sign: Lore.....
Date: 27/04/2021.....

Minutes for the proposed river bank protection for Kanyangareng River project ESIA public participation and stakeholder consultations meetings held at the project site on 13th May 2021

Members present

Refer to the attached list of attendance.

Agenda

1. Preliminaries
2. Proposed project activities
3. Expected project benefits
4. Anticipated adverse impacts of the proposed projects
5. The proposed mitigation measures.
6. The way forward.

Min 01/2021 Preliminaries

The meeting was started by a word of prayer from a community member. The county CEO welcomed the community members to give their views concerning the proposed project

Min 02/2021 The proposed project activities

Min 03/2021 Expected project benefits

Reduced GBV and family conflicts, increased food production, reduced flooding, the road will be passable, protection of Ngatut and Kadara primary schools from flooding, employment opportunities, increased household income, improved human health, livelihood diversification, increased livestock numbers, attracts investment, improved infrastructures, increased prices for construction materials, increased school enrollment, increased business opportunities amongst women, increased revenue to the government.


Min 04/2021 Anticipated adverse impacts of the project

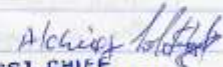
Loss of land under crop farming, reduced food production, increased household conflicts

loss and destruction of vegetation, soil erosion, ~~to~~ Relocation of bee hives, increased cases of school dropouts amongst girls, moral decay, dust emissions, accidents increased cases of STIs & STDs

Min 05/2021 The proposed mitigation measures:
The contractor to create awareness to the public ^{and employees} on matters concerning school drops
Employ a well trained and experienced drivers, include those who lost their pieces of land in the employees list and provide them with fruit seedlings.

Min 06/2021 The way forward
All the participants and stakeholders agreed unanimously to the no objection question and gave a way forward that the project should be implemented for them to enjoy the benefits expected.

Name	ID NO.	Phone Number	Title	Sign	Date
Minutes written by: Cecilia Chando	29911566	0703553244	Secretary		

Approved by T.P. Lotongan 20760723 0706711397 
ASST. CHIEF
KODULEM SUB-LOC.

Minutes for the proposed river-bank protection for Kanyangareng river project ESIA focused group discussions for Females held at the project site on 14 May 2021

Members present

Refer to the attached list of attendance

Agenda

1. Preliminaries
2. The expected project benefits.
3. The anticipated negative impacts
4. The proposed mitigation measures.

Min 01/2021: Preliminaries.

The discussion was opened with a word of prayer from a participant. She then explained more about the project to the members.

Min 02/2021: The expected project benefits.

Employment opportunities especially for the females, increased food production, reduced cases of family wrangles, reduced cases of malnutrition amongst children.

Min 03/2021 The anticipated negative impacts

Increased teenage pregnancies, increased ~~drop~~ school dropouts amongst girls, increased cases of STIs and STDs, introduction of unwanted behaviours in the society

Min 04/2021 The proposed mitigation measures.

Sensitize the community members on modes ^{of spread} and protective measures against STIs & STDs, Educate the girl child on the risks that come about unprotected sex at teen age, provide protective gears such as condoms.

	Name	ID no.	Phone no.	Title	Sign	Date
Minutes written by:	Cicilia Chimabo	25911566	0725532204	Secretary		
Confirmed by:	Loice Odite	31960882		Chairperson		
Approved by:	T. P. Lutungar	20762723	07228911377	Alchery		

ASST. CHIEF
KODULEM SUB LOC.

Annex 4: Attendance Register for ESIA community participation



ATTENDANCE LIST (COMMUNITY)

Activity: public participation and stakeholder consultation meetings Project ESIA
Date:
Venue: NIGIROI

No	Name	Gender	Designation/ Position	Ward/Committee	ID No.	Phone No.	Sign
1	ETIRWAI ASIMWANGA	M	Member	KAPCHOK	34102322	0790187422	
2	JERENIAH KROP	M	Member	KAPCHOK			
3	MOSES LOKROI	M	Member	KAPCHOK	34255956	0765350073	
4	PHILIP MUEL	M	Member	KAPCHOK		0728529098	
5	LONGALE ALIMAKORU	M	Member	KAPCHOK	27485446	0718822878	
6	JOEL JERO ETIRWAI	M	Member	KAPCHOK		079018742041	
7	LEIMWANGA ALIMAKORU	M	Member	KAPCHOK		0795113273	
8	LOSIWANGA ETIRWAI	M	Member	KAPCHOK		07608264202	
9	PAUL MUESTO	M	Member	KAPCHOK			
10	ABEL LOKWIKO	M	Member	KAPCHOK			
11	JAMES LONGALE	M	Member	KAPCHOK	23420087	0110932287	
12	JOHN BOSCO	M	Member	KAPCHOK		072606144	



ATTENDANCE LIST (COMMUNITY)

Activity: *WORK FOR FID FOR PROPOSED KANYANG'ARENG RIVER BANK PROTECTION PROJECT (ESIA)* Date: *14/8/2021* Venue: *NGOTU KANYANG'ARENG AGRICULTURE CENTRE*

No	Name	Gender	Designation/ Position	Ward/Committee	ID No.	Phone No.	Sign
1	CHERON DOMONADI	F	MEMBER	KAPCHOK	9517842		<i>[Signature]</i>
2	CHRISTINE NGOLEHOS	F	MEMBER				<i>[Signature]</i>
3	ELIZABETH LOMOLER	F	MEMBER				<i>[Signature]</i>
4	DINATH BAUDI	F	"				<i>[Signature]</i>
5	KONANJAT LORIPA	F	"				<i>[Signature]</i>
6	MILKA CHEBOGITHO	F	"		87282286	0728529098	<i>[Signature]</i>
7	DOROS LONGIROBO	F	"		81626427		<i>[Signature]</i>
8	SELINA PETER	F	"				<i>[Signature]</i>
9	CHEPOLILIPALICE	F	"		31960882		<i>[Signature]</i>
10	DAEL LONYARENA	F	"				<i>[Signature]</i>
11	JOHN KIPUSO	M	EXPERT		11847741	0722283787	<i>[Signature]</i>
12	Philip Nardiga	M	EXPERT		13450711	0720848953	<i>[Signature]</i>
13	Cecilia Chembo	F	Researcher		284115166	0702553244	<i>[Signature]</i>



ATTENDANCE LIST (COMMUNITY)

Activity: Public Participation and stakeholder consultation meeting ^{ESIA} Date: 17.11.2021 Venue: NGETI

No	Name	Gender	Designation/ Position	Ward/Committee	ID No.	Phone No.	Sign
13	MICHAEL KOKWASE	M	MEMBER	KAPCHOK	-	0792549453	
14	JOSEPH LORENCE	M	MEMBER	KAPCHOK	26882993	0706111113	
15	KALOKURU LOMERON V	M	MEMBER	KAPCHOK	4518397	0700618381	
16	KOSIUMAYANG ETIPWAI	M	MEMBER	KAPCHOK	34102322	0790187422	
17	PETER LOKHWAMU	M	MEMBER	KAPCHOK	-	-	
18	PETER TOLINO	M	MEMBER	KAPCHOK	-	075580758354518	
19	ABDULGOLE TOKWAKHACHIV	M	MEMBER	KAPCHOK	20350842	0706928487	
20	LONTATUDO TOKWAKHACHIV	M	MEMBER	KAPCHOK	2689862	0797639466	
21	TETIHO MORET	M	MEMBER	KAPCHOK	8155237	072892000	
22	ECHOLUWA MERRERWA V	M	MEMBER	KAPCHOK	-	-	
23	MUNSA KIBET	M	MEMBER	KAPCHOK	2675091	078555235	
24	LONBOLEKENG DOMOKIM	M	MEMBER	KAPCHOK	-	0711240818	
25	AGNETA ALELO	F	LEADER	WIPUNT	2324254	0723690718	

Results made



ATTENDANCE LIST (COMMUNITY)

Activity: COMMUNITY SACAZA FOR RIVER KANYANG'ARENG BANK PROTECTION WORKS. Date: 13/5/2021 Venue: N.G.T.V.F. - KANYANG'ARENG

No	Name	Gender	Designation/Position	Ward/Committee	ID No.	Phone No.	Sign
1	CHEPURAI DOMOKUMING	F	TREASURER	KAPCHOK	9517842		
2	JEREMIAH KEOI	M	MEMBER	KAPCHOK	3610222	0725227662	<i>[Signature]</i>
3	CHEMORAL KIRAPUS	F	MEMBER	KAPCHOK			
4	ISAAC LONCUMAMING	M	MEMBER	KAPCHOK			
5	Lemuel Lokumarak	M	MEMBER	KAPCHOK		0725270037	<i>[Signature]</i>
6	KORINYANG BIWOLE	M	MEMBER	KAPCHOK	9169269		<i>[Signature]</i>
7	PAUL MUKTO	M	MEMBER	KAPCHOK		0714101452	<i>[Signature]</i>
8	Lokumaris Loncumamak	M	VICE CHAIRMAN	KAPCHOK	26885544	0791746702	<i>[Signature]</i>
9	Limonosia Ochi	M	MEMBER	KAPCHOK	26882910	0899552464	<i>[Signature]</i>
10	KIRAPUS CHEMAMING V	M	MEMBER	KAPCHOK			<i>[Signature]</i>
11	ENIMIANUS LONCUMAMING	M	CHAIRMAN	KAPCHOK	26885933	0721600096	<i>[Signature]</i>
12	LUKA KEMOLE	M	MEMBER	KAPCHOK	26889819	0728349307	<i>[Signature]</i>
13	John Kapus	M	EX-GR		11847741	0722285787	<i>[Signature]</i>
14	Galina Chemobo	F	EIA Facilitator		8994566	0708553244	<i>[Signature]</i>



ATTENDANCE LIST (COMMUNITY)

Activity: MEN ERS FOR PROPOSED KANYANG'ARENG RIVERBANK PROTECTION WORKS (EIA) Date: 15/11/2011 Venue: NIGHT CENTRE

No	Name	Gender	Designation/ Position	Ward/Committee	ID No.	Phone No.	Sign
25	PHILIP NANGORIA ✓	M	MEMBER	KAPCHOK	-		<i>[Signature]</i>
26	MUSA NATULIA ✓	M	MEMBER	Kapchok	-	0112302401	AD
27	PHILIP NATULIA ✓	M	MEMBER	Kapchok	26556215	0749019708	<i>[Signature]</i>
28	PETER KOKODI ✓	M	MEMBER	Kapchok	9169167	0706676973	<i>[Signature]</i>
29	KARIMAGA LUMAKORI ✓	M	MEMBER	Kapchok	2030081	0703674504	<i>[Signature]</i>
30	JOSUAH MOSES	M	MEMBER	Kapchok	34352556	0745350073	<i>[Signature]</i>
31	JOHN BUSCO	M	MEMBER	KAP-CHOK	23470087	0720606144	<i>[Signature]</i>
32	LONCOLE ALUMAKORI	M	MEMBER	Kapchok	27485446	078800878	<i>[Signature]</i>
33	JOSEPH N. LUPAH	M	MEMBER	Kapchok	-	0711161573	<i>[Signature]</i>
34	LONCOLE ALUMAKORI ✓	M	MEMBER	Kapchok	-	0783850443	<i>[Signature]</i>
35	CICHA CHOMBO	F	MEMBER	Kapchok	9991566	070353244	<i>[Signature]</i>
36	JOHN KAP-CHOK	M	EX-PRES		11847741	072285787	<i>[Signature]</i>
37	Philip Nandwa	M	Expect		1345711	0720848975	<i>[Signature]</i>



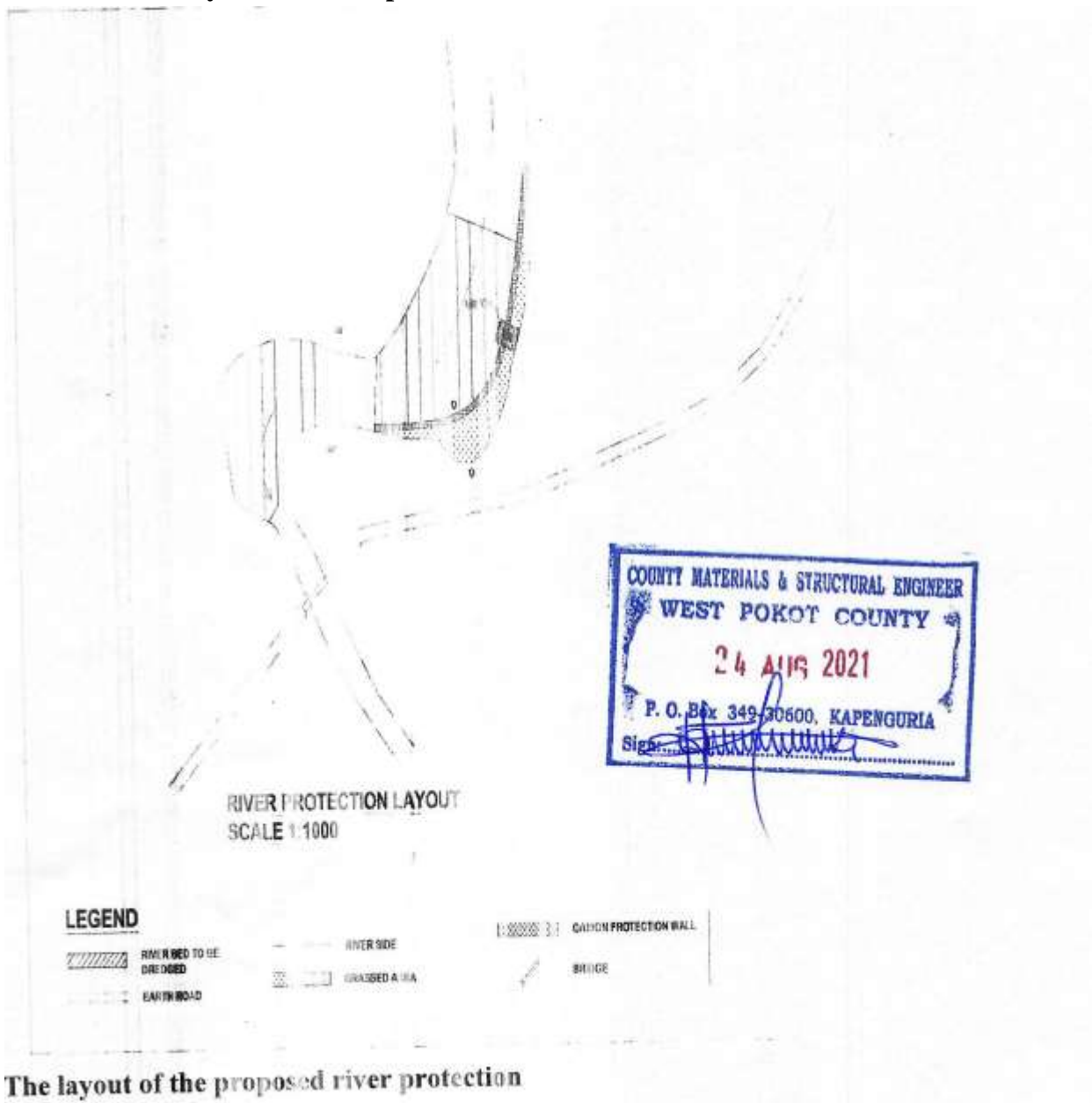
ATTENDANCE LIST (COMMUNITY)

Activity: Public participation and stakeholder consultation for ESIA Project

Date: 17/08/2017 Venue: Ngeti

No	Name	Gender	Designation/ Position	Ward/Committee	ID No.	Phone No.	Sign
1	ETIRUMI ASIMUNYANG	M	Member	KAPCHOK	34102322	0790187422	[Signature]
2	JEREMIAH KROP	M	Member	KAPCHOK			[Signature]
3	MOSES LOKROI	M	Member	KAPCHOK	34255956	0745350073	[Signature]
4	PHILIP MUI	M	Member	KAPCHOK		0798529098	[Signature]
5	LONDAKE ALIMAKORU	M	Member	KAPCHOK	27485446	0718822878	[Signature]
6	JOEL JERO ETIRUMI	M	Member	KAPCHOK		07901874204	[Signature]
7	LONDAKANGA ALIMAKORU	M	Member	KAPCHOK		0795113273	[Signature]
8	LONDAKANGA ETIRUMI	M	Member	KAPCHOK		0748264202	[Signature]
9	PHILIP MUI	M	Member	KAPCHOK			[Signature]
10	ABEL LOKWURO	M	Member	KAPCHOK			[Signature]
11	JAMES LONGARA	M	Member	KAPCHOK		0114932287	[Signature]
12	JOHN BOSCO	M	Member	KAPCHOK	2348087	072806144	[Signature]

Annex 5: The Layout of the Proposed River Protection



The layout of the proposed river protection

Annex 6: Lead Expert NEMA Practising License

FORM 7 (r.15(2))



nema
managing nature | stabilizing water | restoring wetlands

**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT**

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

License No : NEMA/EIA/ERPL/14231
Application Reference No: NEMA/EIA/EL/18592

M/S **RAPHAEL PKEMOI MAGAL**
(individual or firm) of address
P.O. Box 664-30600, KAPENGURIA

is licensed to practice in the
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **6708**
in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/25/2021** Expiry Date: **12/31/2021**

Signature.....
(Seal)
Director General
The National Environment Management
Authority

P.T.O.

ISO 9001: 2008 Certified

Handwritten notes:
SUBMITTED FOR KANYANG'ARENG IRRIGATION PROJECT
KAPCHOK WARD

Annex 7: Land Ownership Documents

Annex 7.1: Letter from CEC Lands and Physical Planning

REPUBLIC OF KENYA



COUNTY GOVERNMENT OF WEST POKOT



DEPARTMENT OF LANDS, PHYSICAL PLANNING, HOUSING AND URBAN DEVELOPMENT

When replying please quote
Email: ocs@westpokot.go.ke
Website: www.westpokot.go.ke

OFFICE OF THE COUNTY EXECUTIVE COMMITTEE
P.O BOX 222-30600
KAPENGURIA

9TH SEPTEMBER, 2021

KENYA CLIMATE SMART AGRICULTURE PROJECT,
P.O BOX 1-30600,
KAPENGURIA

RE: LAND RESERVATION FOR CONSERVATION ALONG KANYANGARENG RIVER TO KANYANG’ARENG BRIDGE

The land is situated in Kapchok ward, near Ngotut trading centre. It is approximately 0.43 hectares and touches the Kanyangareng river to the south and borders Ngotut primary school and Ngotut trading centre to the North. The land was identified for urgent conservation to avert cases of flooding near the centre and to protect Kapenguria-Kasei/Alale road from damages associated with heavy flooding that occurs during rainy season in the area.

Therefore, the land has been reserved for public purpose and conservation by the community of the area.

Thank you



AUGUSTINE MONGES
COUNTY EXECUTIVE COMMITTEE MEMBER,
LANDS, PHYSICAL PLANNING, HOUSING AND URBAN DEVELOPMENT
WEST POKOT COUNTY

Annex 8: Project Photo Gallery



Photo 1: A View of Kyang'areng Bridge



Photo 2: Siltation at Kyang'areng River



Photo 3:Maize Farm Along The River





Photo 4: Livestock Grazing On The Riparian of R. Kanyangaren

Photo 5: Stakeholders Consultation



Photo 6: Public Participation Session

Photo 7: Community Members & Expert Consulting On The Project

Annex 9: Letter of No Objection from WRA



WATER RESOURCES AUTHORITY

Sub Regional Manager,
Water Resources Authority,
Upper Turkwel Sub – Region
P.O. BOX 442-30600,
KAPENGURIA

Tel: 054-62234
Cell: 0721-262686
Email: kapenguriawra@gmail.com.

REF: WRMA/KAPE/WR/3/15

Date: 27th October, 2021


Kanyangareng River Bank Works Sub Project
P.O. Box 245-30600
KAPENGURIA

RE: APPLICATION TO PROTECT RIVER BANK-KANYANGARENG RIVER

The office acknowledge receipt of your application for water permit to construct a wall for land conservation at Kanyangareng River Bank and the following documents were submitted

1. Application form WRMA001A
2. Letter from the Ministry of land
3. Copy of registration certificate of the group
4. List of members
5. Copy of PIN certificate
6. Hydrological assessment report
7. Technical design report
8. River Bank Protection layout
9. WRUA form WRMA 003
10. Soil and water conservation from
11. EAI License
12. Assessment fee of Kshs. 40,000/- (forty thousand shillings only)- and permit fee of Kshs. 50,000(fifty thousand shillings only)

In regard to this, the office has no objection for you to proceed with the works as your application is being processed.


Muigai Munene
Sub Basin Co-coordinator
Upper Turkwel Sub - Basin
KAPENGURIA

Annex 10 Integrated Pest Management Plan



**INTEGRATED PEST MANAGEMENT PLAN FOR MANGO TREE FRUITS
KANYANGARENG RIVER WEST POKOT COUNTY**



JULY 2021

1. introduction

The Kenya Climate Smart Agriculture Project (KCSAP) is a Government of Kenya initiative Supported by the World Bank. The Project Development Objective is “*to increase agricultural productivity and build resilience to climate change risks in the targeted smallholder farming and pastoral communities in Kenya, and in the event of an Eligible Crisis or Emergency, to provide immediate and effective response*”. It also aims at reducing GHGs in the atmosphere.

The proposed Project activities will contribute to these objectives by Up-scaling Climate-Smart Agriculture (CSA) Practices and supporting smallholder farmers to adopt integrated climate-smart Technology, Innovation and Management Practices (TIMPs). The activities to be carried out include river bank protection through building of gabions and planting of fruit trees, which are prone to pests and diseases. To control these pests, an IPMP is needed to manage and control pest management practices.

2. Objectives of pest management plan

- a) To document pests, current and expected status and their management
- b) To describe pesticides used in ASALs
- c) To identify policy, regulatory framework and institutional capacity needed in pest management
- d) To propose activities that ensure success of pest management plan
- e) To develop work plan and budget for pest management activities
- f) To develop monitoring and evaluation schedule for pest management activities

3. Purpose of the pest management plan

The purpose of the pest management plan is to ensure that pest management is carried-out in a sound manner that ensures:

- a) Pest infestation do not result to economic loss accruing to the farmers,
- b) Target pests do not develop resistance fast, or, the resistance development is delayed,
- c) There is protection of
 - i) Health of users and other humans,
 - ii) Environmental health,
 - iii) Non target organisms such as natural enemies and pollinators
- d) Products meet food safety and food quality minimum standards,
- e) Social fabric of the community is protected.

4. IPM programs principles

- a) Pest identification
- b) Monitoring and assessing pest’s numbers and damage
- c) Guidelines for when management is needed
- d) Preventing pest problems
- e) Using a combination of biological, cultural, physical/mechanical and chemical management tools
- f) After action is taken assessing the effect of pest management

5. IPM options:

The most effective long-term way to manage both crop and livestock pests is by using a combination of methods that work better together than separately. Approaches for managing pests are often grouped in the following categories.

6. Cultural control

This method controls pests involves the following practices:

- Plant resistant /tolerant green gram varieties
- Intercrop with cereals eg maize, green gram to build wasps presence
- Fertilize crop well
- Early land preparation and weeding
- Carryout right plant spacing.
- Alternate one season fallow period to allow more buildup of natural enemies
- Crop rotation

7. Physical control

This method of pest control controls pests through the following:

- Expose plants to open environment
- Hand picking the pest from the plant
- Uproot the most affected plant

8. Biological control

The method controls pests through:

- Spraying with biological agent products e.g. neem products i.e. ash, thuricide natural guard caterpillar killer
- Conserving the natural enemies of pests e.g. spiders
-

9. Chemical spray prudent use

This method of pest control is recommended for use in controlling pest through:

- Scouting for pests/ insect and checking out presence of wasps in the field
- Spraying with biological products and soft chemicals. i.e. actara, to conserve beneficial organisms
- Monitoring and confirming presence of wasps and bees as an indicator of healthy environment.

10. Pesticides Use and Management

Pesticide use in either crop or livestock production is necessary, in order to prevent, reduce, or control the potential contamination of soils, wildlife, groundwater, or surface water resources caused by accidental spills during transfer, mixing, storage, and application, pesticides should be stored, handled, and applied in a manner consistent with the recommendations for hazardous materials management presented in the General EHS Guidelines. A pesticide management plan (PMP) that includes procedures for the selection, procurement, storage, handling, and ultimate destruction of all out-of-date stocks should be prepared in accordance with FAO guidelines and should be consistent with country commitments under the Stockholm, Rotterdam, and Basel Conventions. The PMP prescribes the type of pesticides to be used, as well as the purpose of their use, and outlines best practice for the procurement and storage of all pesticides. Personnel must have appropriate training—including certification, where relevant—to handle and apply pesticides safely. In particular:

- Ensure that any pesticides used are manufactured, formulated, packaged, labelled, handled, stored, disposed of, and applied according to the FAO’s International Code of Conduct on Pesticide Management.

ESIA –Kanyang’areng Riverbank Protection, Kapchok Ward, West Pokot County

- Do not purchase, store, use, or trade pesticides that fall under the World Health Organization’s (WHO) Recommended Classification of Pesticides by Hazard Classes 1a (extremely hazardous) and 1b (highly hazardous), or Annexes A and B of the Stockholm Convention.
- Do not use pesticides listed in WHO Hazard Class II (moderately hazardous), unless the project has appropriate controls established with respect to the manufacture, procurement, or distribution and/or use of these chemicals. These chemicals should not be accessible to personnel without proper training, equipment, and facilities in which to handle, store, apply, and dispose of these products properly.
- Preferentially, use selective pesticides, where appropriate, rather than broad-spectrum products to minimize impacts on non- target species.

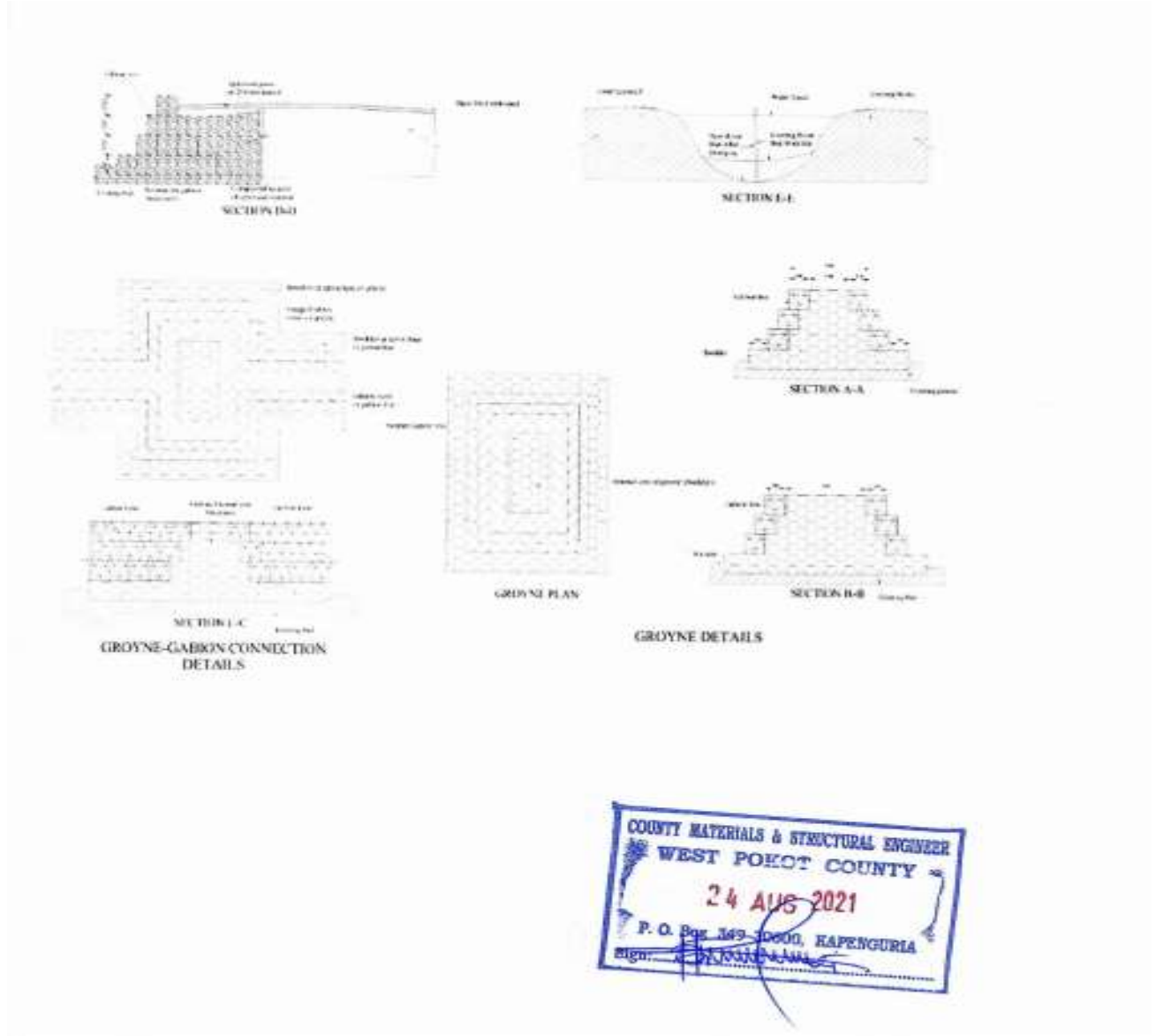
Some of the anticipated pest problems and the proposed management strategies are provided in table 1 below. Table 1: anticipated pest problems and their management strategies in the proposed project sit

Fruit type	Description	Pest problem	Problem status	Pest management strategies
Mango	Arid, semi- arid	Fruit flies (Ceratitis spp; Bactrocera invadens)	Current, anticipated high risk	<ul style="list-style-type: none"> • Harvest as much fruit as possible; sort out the edible fruit and bury all those that are infested, • Apply recommended chemicals: chlorpyrifos when necessary, • Use toxic bait sprays e.g. yeast products mixed with malathion or fenthion around the tree base, • Removal of infested fruits and proper disposal (collect and bury at least 10 feet deep) • Fruit bagging before maturity to prevent egg laying • Male annihilation technique: mass trapping of males using methyl eugenol pheromone+ malathion as pesticide • Augmentorium: a structure that would allow escape of natural enemy but trap the emerging fruit flies from infested fruits • Field sanitation, area wide management, Removal of wild hosts Monitoring,
		Mango weevils (Sternochetus mangifera)	Current anticipated high risk	<ul style="list-style-type: none"> • Removal of infested fruits at least twice a week and proper disposal (collect and bury at least 10 feet deep), • Selected less susceptible varieties, such as Ngowe, Boribo, • Maintain field sanitation at the end of the season by clearing all seeds under the tree canopy
		Mango mealybug (Rastrococcus iceryoides)	Current anticipated high risk	<ul style="list-style-type: none"> • Spray contact/systemic insecticides, • Control of attendant ants to reduce spread of the pest • Encourage biological control build up
		Mango anthracnose (Colletotrichum gloeosporioides)	Current, anticipated high risk	<ul style="list-style-type: none"> • Apply available registered fungicides, • Proper pruning to reduce excessive and minimise disease build-up, • Use the recommended post-harvesting treatment

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		Powdery mildew (Oidium spp)	Current, anticipated high risk	<ul style="list-style-type: none"> Apply recommended fungicides
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Annex 11: Design Drawings



Annex 12. Chance Find Procedure

1. Purpose of the chance find procedure

The chance find procedure is a project-specific procedure that outlines actions required if previously unknown heritage resources, particularly archaeological resources, are encountered during project construction or operation. A Chance Find Procedure, is a process that prevents chance finds from being disturbed until an assessment by a competent specialist is made and actions consistent with the requirements are implemented.

2. Scope of the chance find procedure

This procedure is applicable to all activities conducted by the personnel, including contractors, that have the potential to uncover a heritage item/site. The procedure details the actions to be taken when a previously unidentified and potential heritage item/site is found during construction activities. Procedure outlines the roles and responsibilities and the response times required from both project staff, and any relevant heritage authority.

3. Induction/Training

All personnel, especially those working on earth movements and excavations, are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

4. Chance find procedure

If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

1. Stop all works in the vicinity of the find, until a solution is found for the preservation of these artefacts, or advice from the relevant authorities is obtained;
2. Immediately notify a foreman. The foreman will then notify the Resident/Supervising Engineer and the Environment Officer (EO)/Environmental Manager (EM);
3. Record details in Incident Report and take photos of the find;
4. 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 take over;
5. Preliminary evaluation of the findings by archaeologists. The archaeologist must make a rapid assessment of the site or find to determine its importance. Based on this assessment the appropriate strategy can be implemented. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage such as aesthetic, historic, scientific or research, social and economic values of the find;
6. Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule

of the Contractor. The results of all archaeological work must be reported to the National Museums of Kenya (NMK), once completed.

7. In case of significant find the National Museums of Kenya (NMK) should be informed immediately and in writing within 7 days from the find.

8. The onsite archaeologist provides the NMK with photos, other information as relevant for identification and assessment of the significance of heritage items.

9. The NMK must investigate the fact within 2 weeks from the date of notification and provide response in writing.

10. Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;

11. Construction works could resume only after permission is granted from the responsible authorities.

12. In case no response received within the 2 weeks’ period mentioned above, this is considered as authorization to proceed with suspended construction works.

One of the main requirements of the procedure is record keeping. All finds must be registered. Photo log, copies of communication with decision making authorities, conclusions and recommendations/guidance, implementation reports - kept.

5. Additional information

Management options for archaeological site

- a) **Site avoidance.** If the boundaries of the site have been delineated attempt must be made to redesign the proposed development to avoid the site. (The fastest and most cost-effective management option)
- b) **Mitigation.** If it is not feasible to avoid the site through redesign, it will be necessary to sample it using data collection program prior to its loss. This could include surface collection and/or excavation. (The most expensive and time-consuming management option.)
- c) **Site Protection.** It may be possible to protect the site through the installation of barriers during the time of the development and/or possibly for a longer term. This could include the erection of high visibility fencing around the site or covering the site area with a geotextile and then capping it with fill. The exact prescription would be site- specific.

Management of replicable and non-replicable heritage

Different approaches for the finds apply to replicable and non-replicable heritage.

Replicable heritage¹

¹ Replicable cultural heritage is defined as tangible forms of cultural heritage that can themselves be moved to another location or that can be replaced by a similar structure or natural features to which the cultural values can be transferred by appropriate measures. Archaeological or historical sites may be considered replicable where the particular eras and cultural values they represent are well represented by other sites and/or structures.

Where tangible cultural heritage that is replicable and not critical is encountered, mitigation measures will be applied. The mitigation hierarchy is as follows:

- a) Avoidance;
- b) Minimization of adverse impacts and implementation of restoration measures, in situ;
- c) Restoration of the functionality of the cultural heritage, in a different location;
- d) Permanent removal of historical and archaeological artefacts and structures;
- e) Compensation of loss - where minimization of adverse impacts and restoration not feasible.

Non-replicable heritage²

Most cultural heritage is best protected by in situ preservation, since removal is likely to result in irreparable damage or even destruction of the cultural heritage. Nonreplicable cultural heritage must not be removed unless all of the following conditions are met:

- a) There are no technically or financially feasible alternatives to removal;
- b) The overall benefits of the project conclusively outweigh the anticipated cultural heritage loss from removal; and
- c) Any removal of cultural heritage must be conducted using the best available technique advised by relevant authority and supervised by archaeologist.

Human Remains Management Options

The handling of human remains believed to be archaeological in nature requires communication according to the same procedure described above. There are two possible courses of action:

- a) **Avoid.** The development project is redesigned to completely avoid the found remains. An assessment should be made as to whether the remains may be affected by residual or accumulative impacts associated with the development, and properly addressed by a comprehensive management plan.
- b) **Exhume.** Exhumation of the remains in a manner considered appropriate by decision makers. This will involve the predetermination of a site suitable for the reburial of the remains. Certain ceremonies or procedures may need to be followed before development activities can recommence in the area of the discovery.

² Nonreplicable cultural heritage may relate to the social, economic, cultural, environmental, and climatic conditions of past peoples, their evolving ecologies, adaptive strategies, and early forms of environmental management, where the (i) cultural heritage is unique or relatively unique for the period it represents, or (ii) cultural heritage is unique or relatively unique in linking several periods in the same site. Examples of non-replicable cultural heritage may include an ancient city or temple, or a site unique in the period that it represents.