

SUMMARY PROJECT REPORT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR CONSTRUCTION WORKS FOR SIRIWO ENHANCED RICE PROCESSING AND MARKETING AT USONGA WARD IN SIAYA.



National Agriculture Value Chain Development Project (NAVCDP)
Usonga Rice Cooperative Society
P.O. Box 122 40600 Urunga
Latitude E 0.084594, Longitude S 34.082015

Prepared By: Lead Expert

. Fredrick Aloo
Registration No: 9049,
P.O. Box, 34188-00100 Nairobi, Kenya
TEL 0726589117
Email: fredrick.aloo@gmail.com

February 2026

FACT SHEET

Project Name	Environmental and Social Impact Assessment for Proposed Construction of Rice Curing and Product Store in Siriwo Uasi Village Usonga Ward Alego Usonga Sub County
Assignment Name	Environmental and Social Impact Assessment (ESIA) Summary Project Report (SPR)
Location	Siriwo Uasi Village, Usonga Ward Alego Usonga Sub County, Siaya County
GPS Coordinates	Latitude 0.084594, Longitude 34.082015
Project Description	The proposed investment consists of construction of a curing store, a product store and purchase of tractor, rotavators, combine harvester and hybridization/Solarisation of power supply. This investment aims to increase market participation for rice farmers within the Usonga area through value addition, reduction of post-harvest losses, improvement in efficiency and reduction in emission of GHG.
Main source of water	It will be from a borehole owned by the county government. The borehole is about 100 meters from the project site
Proponent	Usonga Rice Cooperative Society
Address of the Proponent	Usonga Rice Cooperative Society Email: usongarice@gmail.com / makhulojohn@gmail.com P.O Box 122 -40600, Uranga.

CERTIFICATION

For and on behalf of:

Usonga Rice Cooperative Society:

This Environmental Social Impact Assessment (ESIA) Summary Project Report was prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 and the Environmental Impact Assessment and Audit Regulations 2003 (revised 2015 & 2019) in order to meet the statutory requirements for the implementation of projects under schedule II.

I, the undersigned, confirm that the contents of this report are a true representation of the ESIA process for the Construction of Rice Curing and Product Store in Siriwo Uasi Village Usonga Ward Alego Usonga Sub County

LEAD ESIA/ EA EXPERT

FREDRICK ALOO

NEMA REG. No. 9049

P. O. BOX 34188 -0000

NAIROBI, KENYA

Signature



Date. 31th-03-2025

Proponent

Usonga Rice Cooperative Society Ltd

P.O Box 122 -40600, Uranga.

Name John Makhulao Secretary

Signature



Designation: Chairman Usonga Rice Cooperative Society Date 31st -03-2025

TABLE OF GENERAL INFORMATION

Project	Summary Project Report for Construction Works for Siriwo Enhanced Rice Processing and Marketing at Usonga Ward in Siaya.
Location	Siriwo Uasi Village, Usonga Ward, Alego Usonga Sub County, Siaya County
County	Siaya
Project objective	The investment objective is to increase farmers' income through value addition and processing in Siaya County by 2027
Project description	The proposed investment consists of construction of a curing store, a product store, and purchase of, tractor, rotavators, combine harvester and hybridization/Solarisation of power supply. This investment aims to increase market participation for rice farmers within the Usonga area through value addition, reduction of post-harvest losses, improvement in efficiency and reduction in emission of GHG.
Project classification	Medium-risk project
Public participation meeting date	31/03/2025
Anticipated positive impacts	Positive impacts identified by stakeholders include the following: ○ Increased employment opportunities ○ Provide animal and poultry feeds ○ Reduced post harvest losses ○ Improved livelihoods ○ The proposed construction will ensure that there is storage facilities for rice hence reducing wastage ○ Value addition on to the rice value chain ○ Increased availability of money and circulation of money around the area ○ Availability of market for the rice ○ Enable increased rice production
Anticipated negative impacts	Some of the negative impacts identified include the following: ○ Dust and air pollution during construction and paints from refurbishments ○ During operation phase there will be increased population of birds, increasing chance of diseases ○ Anticipated possible conflicts over water use during irrigation ○ Increased pressure due to demand of water for irrigation ○ Incidences of erosion along the waterways ○ Cases of siltation ○ Increased incidences of malaria ○ Increase solid waste production of husks after milling ○ Influx of people from outside ○ Chance of increased incidences of HIV/AIDs

	○ Loss of biodiversity during construction ○ Increased chances of theft ○ Pollution due to solid waste disposal

DISCLAIMER

This EIA Summary Project Report is strictly confidential to Usonga rice cooperative society ltd and any use of the materials thereof should strictly be in accordance with the agreement between the proponent and the ESIA/EA Expert/s mentioned herein (**Fredrick Aloo**). It is subject to conditions spelt out in the Environmental (Impact Assessment and Audit) Regulations Amended in 2019 under the Kenya Gazette Supplement No. 62, Legislative Supplement No. 16, and Legal Notice No. 31 of 2019. It provides information on the proposed project as per the time of EIA in the year 2026

ACKNOWLEDGMENT

We, the ESIA study team Fredrick Aloo (Lead Expert), Elijah Lwevo (Lead Expert), County ESS team and Mr. Benard Ayagah (Associate) wish to acknowledge and express our profound gratitude to the Siaya National Agriculture Value Chain Development Project (NAVCDP). We thank the County Project Coordinating Unit especially the County Project Coordinator, Mr Vincent Okoth, Caroline Majuma Social Safeguards (NAVCDP), Eng Kevin Obiero the NAVCDP County infrastructure officer and Mr Edwin Oswaga the County Works surveyor, Mrs Diana Awuor the County Environmental and Social Siaya Municipality for commissioning this Environmental Social Impact Assessment - Summary Project Report Study.

We appreciate the cooperation and contributions of all the stakeholders who we interacted with during this EIA report, without their support this study would not have been successful.

We would also like to affirm our appreciation to Mr David Olang from the Environment and Social Safeguards Specialist for, National Agriculture Value Chain Development Project, Not forgetting the NEMA county office team for their guidance in the preparation of this SPR. Finally, we wish to appreciate the contributions made by the entire community for providing us with useful information and filling out questionnaires during the field visits and public participation forums.

EXECUTIVE SUMMARY

This Environmental and Social Impact Assessment (ESIA) Report has been prepared for the proposed construction works for the Siriwo Enhanced Rice Processing and Marketing Facility located in Usonga Ward, Siaya County. The County Government of Siaya and NAVCDP project in collaboration with key stakeholders within the rice value chain, including farmer organizations, traders, and technical agencies, with the overall aim of strengthening post-harvest handling, promoting value addition, and improving structured marketing of rice produced within the region. The proposed facility represents a strategic investment intended to transform the local rice value chain by addressing systemic challenges that have historically undermined productivity, profitability, and competitiveness.

Rice farming constitutes an important economic activity in Usonga Ward and the wider Siaya region, supporting the livelihoods of numerous smallholder households. However, the sector continues to face significant constraints, including high post-harvest losses, inadequate processing infrastructure, limited storage capacity, low farm-gate prices, and weak market linkages. These challenges have reduced farmer incomes and limited the ability of producers to benefit fully from their investments. The proposed project seeks to respond directly to these issues through the establishment of a modern rice processing and marketing facility equipped with improved milling technologies, appropriate storage facilities, organized waste management systems, and solarised or hybrid power solutions designed to enhance operational efficiency and environmental sustainability.

The broad objective of the project is to enhance value addition and market access for rice farmers, thereby contributing to increased incomes and improved livelihoods within the project area. The specific objectives include improving processing efficiency and rice quality to meet market standards, reducing post-harvest losses through improved handling and storage systems, promoting climate-resilient and energy-efficient technologies, creating employment opportunities for youth and women, and strengthening farmer organizations involved in rice production, aggregation, and marketing. By modernizing local agro-processing infrastructure, the project aims to stimulate inclusive economic growth and foster resilience within the agricultural sector.

The project is justified and anchored in national and county development priorities that emphasize sustainable development, poverty reduction, and food security. It supports the principles of sustainable development and socio-economic rights enshrined in the Constitution of Kenya and contributes to the realization of the country's long-term development blueprint, Kenya Vision 2030. Furthermore, the project aligns with the Sustainable Development Goals (SDGs), particularly those relating to poverty eradication, zero hunger, gender equality, decent work and economic growth, and climate action.

The rationale for undertaking the ESIA is to ensure that all potential environmental and social impacts associated with the construction, operation, and eventual decommissioning of the facility are identified at an early stage, comprehensively assessed, and managed through appropriate mitigation and monitoring measures. The assessment was conducted in compliance with the requirements of the Environmental Management and Coordination Act (EMCA) and its subsidiary

regulations, which require that projects of this nature undergo environmental and social review prior to implementation.

The proposed project site is located within Usonga Ward on land with verified ownership documentation. The site selection process considered factors such as accessibility to rice-producing areas, availability of basic infrastructure, suitability of land use, and minimal ecological sensitivity. The surrounding area is predominantly agricultural, with rice farming forming a central economic activity. The physical environment characterized by gently undulating terrain, soils suitable for agricultural production, and climatic conditions conducive to rice cultivation. No critical ecologically sensitive habitat was identified within the immediate project footprint, although precautionary measures have been incorporated to prevent pollution, habitat disturbance, and resource degradation.

The project will involve site clearance, construction of processing buildings, installation of modern rice milling machinery, development of storage facilities, establishment of waste handling areas, construction of drainage systems, and provision of auxiliary infrastructure such as access roads and sanitation facilities. Design considerations include the integration of solarisation and hybrid energy solutions to reduce reliance on grid electricity, minimize greenhouse gas emissions, and lower operational costs. Load calculations and solar panel sizing is in cooperated to ensure reliable and adequate power supply for the facility's operations.

During the construction phase, activities will include earthworks, building construction, equipment installation, and connection to utilities. Inputs will comprise cement, sand, ballast, steel, roofing materials, machinery components, water, and labor. Anticipated waste streams during construction include excavated soil, packaging materials, scrap metal, and domestic waste generated by workers. Appropriate waste management measures, including segregation, reuse, recycling, and safe disposal, to minimize environmental impacts.

During the operational phase, activities will include rice reception, drying where necessary, milling, grading, packaging, storage, and marketing. Operational waste will include rice husks, bran, broken grains, wastewater, and general solid waste. Rice husks to be reused as fuel or soil amendments where feasible, wastewater will be managed through appropriate drainage and treatment systems, and solid waste will be segregated and disposed of in accordance with regulatory requirements. The facility will incorporate sustainability measures such as energy-efficient machinery, renewable energy integration, water conservation practices, occupational health and safety provisions, and institutional capacity strengthening for farmer organizations responsible for management.

The ESIA report was done for within the framework of relevant national policies, laws, and institutional mandates governing environmental protection, occupational health and safety, public health, land use planning, and energy management. Key legal instruments considered include the Environmental Management and Coordination Act, the Water Act, the Occupational Safety and Health Act, the Public Health Act, the Energy Act, and the Physical and Land Use Planning Act. Oversight and licensing of the project fall under the mandate of the National Environmental Management Authority (NEMA), in collaboration with other sector institutions such as the Water Resources Authority and relevant County Government departments responsible for environment,

agriculture, trade, and public health. The project also aligns with international environmental commitments, including the Convention on Biological Diversity.

Baseline environmental and social assessments indicate that the project area is largely characterized by agricultural land use, with rice farming as a primary livelihood source. The socio-economic profile reveals a growing population dependent on smallholder agriculture, informal trade, and value chain activities. Existing infrastructure such as roads, electricity coverage, mobile telephone networks, and marketing centres provides a foundation for the proposed development, although improvements in water access and sanitation are necessary and have been integrated into the project design considerations.

Public participation formed a critical component of the ESIA process. Stakeholder mapping was undertaken to identify affected and interested parties, followed by administration of questionnaires and consultative meetings with community members, farmer groups, local leaders, and technical officers. The consultations were intended to inform stakeholders about the project, gather their views and concerns, and incorporate local perspectives into project planning. Stakeholders expressed strong support for the project, citing anticipated benefits including employment creation, improved rice prices, enhanced market access, and local economic growth. Concerns raised related to dust and noise during construction, waste management, occupational safety, equitable access to services, and transparency in facility management. These concerns have been addressed through proposed mitigation measures and incorporation into the Environmental and Social Management and Monitoring Plan (ESM&MP). A structured Grievance Redress Mechanism (GRM) will be established to ensure timely and transparent resolution of complaints.

The ESIA evaluated various project alternatives, including the “no-action” alternative, relocation options, and alternative technologies. The no-action alternative would perpetuate existing inefficiencies, post-harvest losses, and low incomes, thereby undermining socio-economic development. Relocation was deemed less feasible due to logistical and economic constraints. Alternative power sources were examined, leading to the adoption of solar or hybrid systems as a sustainable and cost-effective solution. The selected design is considered technically sound, environmentally manageable, and socially beneficial.

Anticipated positive impacts during construction include temporary employment opportunities, local sourcing of materials, and skills transfer. During operation, project activities to generate sustained employment, increase farmer incomes, improve rice quality, enhance food security, and strengthen farmer institutions. Potential negative impacts during construction include dust emissions, noise, solid waste generation, occupational health and safety risks, and minor vegetation clearance. Operational risks include wastewater generation, improper waste disposal if unmanaged, machinery noise, occupational hazards, and potential inequities in access to services. Comprehensive mitigation measures were proposed, including dust suppression, proper drainage systems, waste segregation and recycling, provision of personal protective equipment, occupational health and safety training, enforcement of labor standards, and structured waste utilization mechanisms.

An Environmental and Social Management and Monitoring Plan (ESM&MP) has been developed to guide implementation of mitigation measures. The plan specifies actions, responsible parties, timelines, monitoring indicators, and associated costs. It provides for continuous environmental monitoring, regulatory compliance, occupational health and safety management, stakeholder engagement, grievance handling, and periodic reporting to relevant authorities, including NEMA.

In conclusion, the ESIA finds that the proposed Siriwo Enhanced Rice Processing and Marketing Project is environmentally and socially viable if the recommended mitigation and monitoring measures are fully implemented. The project offers substantial socio-economic benefits, including enhanced value addition, increased household incomes, improved food security, and stimulation of local economic development. Identified adverse impacts are site-specific, manageable, and reversible with appropriate safeguards. It is therefore recommended that the project be approved, subject to compliance with all applicable environmental, social, health, and safety requirements and issuance of an ESIA license by the National Environmental Management Authority. Continuous monitoring, stakeholder engagement, and strict adherence to the Environmental and Social Management and Monitoring Plan will be essential to ensuring sustainable and responsible project implementation.

LIST OF ACRONYMS AND ABBREVIATIONS

AEZ	Agro Ecological Zone
AIDs	Acquired Immunodeficiency Syndrome
CIDP	County Integrated Development Plan
CIGs	Common Interest Groups
CMS	Convention on Migratory Species
EAs	Environmental Audit
EHS	Environmental Health and Safety
EMCA	Environmental Management and Coordination Act, 1999 Revised, 2015
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
ESS	Environment and Social Safeguards
FGD	Focused Group Discussion
GDP	Gross Domestic Product
GoK	Government of Kenya
GHG	Greenhouse Gases
GPS	Global Positioning System
HIV	Human Immunodeficiency Virus
Km ²	Square Kilometers
MEA	Multilateral Environmental Agreements
MOA&LD	Ministry of Agriculture and Livestock Development
NAVCDP	National Agriculture Value Chain Development Project
NEMA	National Environment Management Authority
OSHA	Occupational Health Safety Act
PAPs	Project Affected Persons
PPE	Personal Protective Equipment
SEA	Sexual Exploitation and Abuse
SECAP	Social Environment and Climate Assessment Procedures
SPR	Summary Project Report
STDs	Sexually Transmitted Diseases
SH	Sexual Harassment

DEFINITION OF TERMS

Adaptation: Adjustment or preparation of natural or human systems to a new or changing environment which moderates harm or exploits beneficial opportunities.

Agroecological zones. Geographical mapping units based on climatic conditions and land forms that determine relatively homogeneous crop growing environments

Afforestation: Planting of new forests on lands that historically have not contained forests

Biological insect control. A method of pest control that relies on beneficial enemies to reduce pest populations to tolerable levels. It involves human manipulation of natural enemies of insects.

Carbon Sequestration: Terrestrial, or biologic, carbon sequestration is the process by which trees and plants absorb carbon dioxide, release the oxygen, and store the carbon. Geologic sequestration is one step in the process of carbon capture and sequestration (CCS), and involves injecting carbon dioxide deep underground where it stays permanently.

Climate Change: Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer.

Ecological restoration refers to enhancing the recovery of an ecosystem that has been degraded, damaged, or destroyed (Gann et al., 2019).

Infestation. The presence of insects on a plant or on grain.

Insect. Members of the phylum Arthropoda ("jointed legs"); they have six legs, three distinct body regions (head, thorax, and abdomen), one pair of antennae, and usually wings.

Insecticide. A chemical used for killing insects.

Irrigated rice. Rice which is supplementary or fully supported with water supplied by artificial means.

Land degradation is defined as the reduction in the capacity of the land to provide ecosystem goods and services and guarantee or assure its functions over some time for its beneficiaries.

Paddy. 1). Wetland rice. 2). Bunded and levelled field used for cultivation of rice. The original meaning of paddy (Malay padis) is threshed, unhulled rice.

Land Rehabilitation refers to returning an area of land to its former natural state after some process has resulted in its degradation or damage.

“Gender based violence” refers to any harmful act directed at an individual based on their gender or sex

TABLE OF CONTENTS

FACT SHEET	i
CERTIFICATION	ii
TABLE OF GENERAL INFORMATION	iii
DISCLAIMER	v
ACKNOWLEDGMENT	vi
EXECUTIVE SUMMARY	vii
LIST OF ACRONYMS AND ABBREVIATIONS.....	xi
DEFINITION OF TERMS	xii
TABLE OF CONTENTS.....	xiii
LIST OF TABLES	xviii
LIST OF FIGURES	xviii
LIST OF PLATES	xviii
1 INTRODUCTION	1
1.1 Background information.....	1
1.1.1 Project Proponent and Location.....	2
1.1.2 Objective of the project.....	2
1.2 Project Objective.....	2
1.2.1 Broad objective	2
1.2.2 Specific objectives.....	2
1.3 Project justification.....	2
1.3.1 Rationale for the ESIA	2
1.4 Objectives of the ESIA- SPR.....	3
1.5 Terms of reference.....	3
1.6 Scope of the study	5
1.7 ESIA Approach and methodology	5
1.7.1 Environmental Screening and scoping	5
1.7.2 Environmental Scoping.....	6
1.7.3 Desktop study.....	6
1.7.4 Public consultation.....	6
1.7.5 Reporting.....	7
1.8 ESIA Team.....	7
1.9 Project Implementing agency/structure	7
1.10 Structure of the Report	8

1.11	Study Methodology	8
2	PROJECT DESCRIPTION	10
2.1	Introduction	10
2.2	Project Location	10
2.3	Project Design	10
2.4	Project Activities.....	12
2.4.1	Materials used for construction	14
2.4.2	Project Activities during operation phase	15
2.4.3	Project management activities.....	15
2.5	Waste to be generated and method of disposal.....	15
2.5.1	Effluent Waste	15
2.5.2	Solid Waste.....	16
2.5.3	Gaseous Emissions.....	16
2.5.4	Noise Emissions	16
2.6	Project sustainability.....	16
2.7	Project Cost	17
3	POLICY LEGAL AND INSTITUTIONAL FRAMEWORK.....	17
3.1	Introduction	17
3.2	Relevant Policies	17
3.2.1	Kenya Constitution 2010	17
3.2.2	Vision 2030	17
3.2.3	National Gender and Development Policy, 2000	17
3.2.4	Policy on Gender and Sexual Based Violence 2017.....	18
3.2.5	Kenya National Youth Policy 2006	18
3.2.6	Wetlands policy	18
3.3	Institutional framework	18
3.3.1	National Environmental Management Authority.....	18
3.3.2	Environmental liaison units in other institutions with environmental management mandates in Kenya	19
3.3.3	Water Resources Authority (WRA).....	19
3.3.4	Irrigation Water Resource Users Association (IWRUA)	19
3.4	The Legal Framework.....	20
3.4.1	Environmental Regulatory Framework.....	20
3.4.2	<i>The Public Health Act (Cap. 242)</i>	22
3.4.3	<i>Physical Planning and Land Use Planning Act, 2019</i>	22

3.4.4	<i>The Occupational Health and Safety Act, 2007</i>	22
3.4.5	<i>Employment Act, 2007</i>	22
3.4.6	<i>Work injury benefits Act, 2007</i>	23
3.4.7	<i>National Construction Authority (2011)</i>	23
3.4.8	<i>Climate Change Act, 2016</i>	23
3.4.9	<i>Malaria Prevention Act (CAP 246)</i>	23
3.4.10	<i>The Energy Act, 2019</i>	24
3.4.11	<i>The Community Land Act 2016</i>	24
3.4.12	<i>National legal provisions on Gender, HIV/AIDS and Gender Based Violence 1</i> ..	24
3.4.13	<i>The National Museums and Heritage Act 2006</i>	25
3.5	Environmental and Social Standards	25
3.6	International Conventions and Treaties	29
3.6.1	Conservation of Biological Diversity (CBD) Regulations 2006	29
3.6.2	Sustainable Development Goals	29
4	CHARACTERISTICS OF THE PROJECT AREA	30
4.1	Background information	30
4.2	Overview of Rice value chain	30
4.3	Project location	31
4.3.1	Proof of Land Ownership	32
4.4	Demographic and population profile	32
4.4.1	Population	32
4.5	Physical Environment	33
4.5.1	Topography	33
4.5.2	Soils	33
4.5.3	Ecological and Climatic conditions	33
4.6	Socio economic characteristics of the area	34
4.6.1	Land and Land use/ Zonation	34
4.6.2	<i>Land use and economic activities</i>	34
4.6.3	<i>Ecologically sensitive areas</i>	34
4.6.4	Major Conflicts and resolution	34
4.7	Physical infrastructure	35
4.7.1	Water access and sanitation	35
4.7.2	Roads	35
4.7.3	4.6.3 Telephone connectivity	35
4.6.4	Electricity Coverage and use of Solar	35

4.7.5	Marketing Centres	35
4.7.6	Housing	35
4.7.7	Health and Environment	36
5	PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS.	37
5.1	Public Participation.....	37
5.2	Purpose for the public and stakeholder consultation.....	37
5.3	Public Consultation process	37
5.3.1	Stakeholder mapping	37
5.3.2	Public consultation questionnaires.....	38
5.3.3	Public consultation meetings	38
5.4	Issue raised during the Consultation	39
5.5	Opinion on Project implementation.....	41
5.6	Suggestions and comments from public consultations	41
5.7	Grievance Redress Mechanism (GRM)	42
6	ANALYSIS OF PROJECT ALTERNATIVES.....	44
6.1	Introduction	44
6.2	“No Project alternative	44
6.3	Alternative Site	44
6.4	Alternative design and technology (Include wastes disposals).....	44
6.5	Alternative power source	44
6.6	The project alternative.....	45
7	ANALYSIS OF POTENTIAL IMPACTS AND MITIGATION MEASURES ...	46
7.1	Introduction	46
7.2	Positive Environmental and Social Impacts during construction phase	46
7.2.1	Positive environmental impacts.....	46
7.2.2	Positive social impacts.....	46
7.2.3	Negative environmental impacts during construction phase	47
7.2.4	Negative Social impacts during construction phase.....	50
7.3	Environmental and Social Impacts and Mitigation Measures during Operational Phase	52
7.3.1	Positive environmental impacts during operational phase.....	52
7.3.2	Negative environmental impacts during operation phase	53
7.3.3	Negative social impacts during operational phase.....	53
7.3.4	Negative Environmental and Social Impacts during Decommissioning Phase and Mitigation Measures.....	54

8	ENVIRONMENTAL SOCIAL MANAGEMENT AND MONITORING PLAN (ESM&MP)	55
8.1	Introduction	55
8.1.1	Environmental Social Management& Monitoring Plan	56
9	CONCLUSION AND RECOMMENDATION	68
9.1	Conclusions.....	68
9.2	Recommendations.....	68
10	REFERENCES.....	69
11	ANNEXES	70
	Annex 1: Copies of filled questionnaires	70
	Annex 2: Minutes of public consultation meeting	75
	Annex 3: Public participation attendance list	79
	Annex 4: Ground floor layout.....	82
	Annex 5: Title Deed-	83
	83	
	Annex 6: Screening Checklist	86
	Annex 7: Copy of NEMA license for Usonga Rice Store.....	94
	Annex 8: ESIA Practicing License.....	95
	Annex 9: BQ of the curing and product store	96
	Annex 10: Copy of Certificate of Incorporation for Usonga Rice FCs.....	97
	Annex 11: Photo of participants raising their concerns.....	98
	Annex 12: Site Plan for Usonga Rice Stores	98
	Annex 13: Structural drawing	99
	Annex 14: Site Plan Layout.....	100
	Annex 15: Invitation for stakeholder meeting	101
	Annex 16: Architectural drawing for the store	102
	Annex17: KRA pin certificate	103

LIST OF TABLES

Table 4-1 Analysis of potential triggers to ESS Standards.....	25
Figure 3-2:Location of the project site (Source Google Earth)	32
Table 3-2: Population characteristics Alego Usonga sub county ward	32
Table 3-1 Agro -Ecological Zonation Of Siaya County	34
Table 3-3: Housing type in the Project Area	36
Table 5-1: Stakeholder Consultative meeting key concerns raised	39
Table 5-2: Communication & Stakeholder Engagement Plan.....	43
Table 7-1: Summary of expected impacts, rating and development stage	46
Table 8-1: Environmental and Social Managment and Monitoring Plan(EM&MP).....	57

LIST OF FIGURES

Figure 2-1: Proposed project site plan	Error! Bookmark not defined.
Figure 2-2: Design of the proposed curing store	Error! Bookmark not defined.
Figure 2-3: Design of the Product Store	Error! Bookmark not defined.
Figure 3-2:Location of the project site (Source Google Earth)	32
Figure 11-1Topographical design of the proposed site.....	Error! Bookmark not defined.

LIST OF PLATES

Plate 2-1: Project site and topographical survey being undertaken.....	Error! Bookmark not defined.
Plate 6-1 Community sensitization meetings.....	38
Plate 6-2: Participants filling individual questionnaire.....	39
Plate 6-3: Participants at Nyamisi village raising hands in accapetance of the proposed project	39
Plate 11-1 Paricipants raising their concerns	Error! Bookmark not defined.
Plate 11-2 Enginners and surveyor undertaking topographical designe in the field.....	Error! Bookmark not defined.
Plate 11-3 Community filling qusionnaire checklist while following discussions.....	Error! Bookmark not defined.

1 INTRODUCTION

1.1 Background information

The National Value Chain Development Project NAVCDP is being implemented in 34 Counties to increase market participation and value addition for targeted farmers in 16 prioritized value chains and among the value chains is rice. Siaya County is one of the 34 counties under the NAVCDP. The investment in the rice value chain include commodity markets, agro-processing plants, and infrastructure. The investment will involve, CIGs, FPOs and Cooperative or 4Ps arrangements. The Investment does meet the Project Development Objective of enhanced market participation and value addition by project beneficiaries.

The proposed Enhanced rice-processing project which entails construction of Rice curing and product stores will be implemented under the National Value Chain Development Project (NAVCDP).by the Ministry of Agriculture and Livestock Development, State department of Crops. NAVCDP is a five -year project that is jointly funded by the Government of Kenya (GOK) and the World Bank and beneficiary communities.

The project will be implemented by Usonga Rice Cooperative Society, which started in 2010 first as a Community-Based Organization (CBO) and later in 2022 transitioned into a Cooperative Society reflecting growth and a more structured approach to achieving its goals, with a current membership of 256 (154F,102M) members actively engaged in rice value chain activities.

The society is actively involved in paddy rice production, aggregation, processing, and marketing of milled rice. Usonga Rice Cooperative Society Ltd engages in production, aggregation of paddy rice, processing and marketing of milled rice.

Currently, the cooperative cultivates 1,200 acres, producing approximately 4,000 metric tonnes of rice annually. However, production is expected to expand to 2,000 acres once the World Bank-funded Lower Nzoia Irrigation Project (LNIP) is fully operational. Recognizing the potential of the rice sector, the County Government has supported the cooperative by installing a 2.5 MT/hour rice milling plant, enabling farmers to process their own paddy rice and benefit from by-products such as brown rice, bran, husks, and broken rice.

Specifically, the project will improve rice aggregation by putting up a paddy curing store and finished products store, enhance environmental sustainability through green energy by hybridization of power use, reduce cost of farm operation and improve paddy harvesting efficiency through mechanization and lastly improve production and productivity through capacity building of CIG/VMGs and provision of input subsidy. The proposed project was identified through a PICD process and is in tandem with Siaya County CIDP 2023-2027.

The proposed project is committed to adhering to environmental guidelines which includes formulating plans for climate risk analysis, environmental management, pesticide usage and engagement with local communities

The Environmental and Social Impact Assessment (ESIA) report predicts the likely impacts, their significance, and proposes mitigation measures for identified impacts. The study entailed scooping, screening, back and forth community engagement and was conducted 15 days from 31st of March to 18th of April, 2025. The assessment considered all the impacts of the proposed project from feasibility study design construction, operation and decommissioning.

1.1.1 Project Proponent and Location

Usonga rice cooperative society is the main proponent of the project. The investment lies within Usonga Ward, Alego Usonga Sub-County in Siaya County. It borders Bunyala Sub-County, a major rice growing area in Busia County. Usonga Rice Cooperative Society will implement the investment on behalf of the members. The land on which the project will be implemented is a public land and it has a title deed number 1294 which is in custody of Siaya county government.

1.1.2 Objective of the project

The overall objective of the project is to increase market participation and value addition for targeted farmers in select value chains in project area. Construction of rice curing store and a product store at the Usonga Rice Cooperative Society will facilitate aggregation and marketing of rice among farmers in West Alego, Ugunja and Usonga wards

The expected outcomes include:

- Increase in productivity and number of farmers marketing collectively
- Increase in volumes of produce collectively marketed.
- Increased income and improved livelihoods

1.2 Project Objective

1.2.1 Broad objective

The investment objective is to increase farmers' income through rice value addition and processing in Siaya County by 2027

1.2.2 Specific objectives

- To accelerate aggregation and value addition by improvement of rice post - harvest handling infrastructure.
- To reduce the cost of power bills by enhancing environmentally sustainable green energy hybridization.
- To reduce cost of farm operation and improve paddy harvesting efficiency through mechanization.
- To increase production and productivity through sustainable access to quality farm inputs.

1.3 Project justification

Usonga ward in Alego Usonga Sub County, Siaya County, has substantial potential for rice farming due to its soils and favourable climate and availability of water for irrigated rice farming. However, they face critical infrastructural challenges that severely impact their productivity and profitability. Despite efforts to improve rice production in the region, Usonga rice farmers continue to be hampered by inadequate storage facilities, poor mechanization and insufficient drying floors.

The proposed enhanced rice processing and marketing project is implemented to address the problem of low levels of production, inadequate mechanization, inadequate curing and storage facilities (aggregation facilities) and clean water provision in the cooperative society. The project, was identified through PICD process and is in tandem with Siaya County CIDP 2023-2027.

1.3.1 Rationale for the ESIA

The main purpose for which ESIA is conducted and report prepared is to assist the project proponent, the Environment Management Authority (NEMA) and all other stakeholders in

understanding the project and thus provide a basis for making informed decisions on whether direct or indirect and particularly environmental, social and economic impacts are fully examined and addressed. In the long term ESIA ensures that the proposed development is sustainably implemented.

The World Bank Environmental and Social Standards which comprises of 10 ESS also requires the project proponents to conduct Environment and Social Impact Assessment (ESIA) for projects that have the potential to have significant environmental and social impacts .ESIA helps in identifying potential negative impacts and proposing mitigation measures

The recommendation was in line with NEMA Public Notice on ESIA and Legal Notice No. 31 which identifies the proposed project as Low risk, thus requiring only a Summary Project Report (SPR). Besides, the ESIA was prepared as per the provisions of The World Bank ESS that provides broad coverage on transparency, non-discrimination, social inclusion, public participation, accountability, among others

1.4 Objectives of the ESIA- SPR

1.4.1 Main objective

The main objectives of the environmental impact assessment are to identify and assess all significant impacts of the proposed project on the biophysical and socio- economic environment; and draw an environmental management and monitoring plan with suitable mitigation measures.

1.4.2 Specific Objectives

- Provide in depth description of the proposed development project site
- Describe key components of works such as construction and decommissioning.
- Identify for each component sources of adverse environmental impacts.
- Review policy, legal and administrative framework that should be addressed for the proposed development project to proceed without negatively affecting the environment.
- Provide analysis of alternatives to the proposed development project.
- Develop mitigation measures for identified negative impacts within an elaborate Environmental Social Management and Monitoring Plan (ESMMP).
- Prepare the Summary Project Report.
- Submit the draft SPR to NAVCDP for review and incorporate comments
- Submit the required hard copies and soft copy of the SPR report to NEMA to allow review and approval of the proposed project.

1.5 Terms of reference

The terms of reference on task and scope of the assessment will include but not limited to:

- a) Describing significant findings and key recommended actions and residual risks after implementation of the proposed mitigation measures.
- b) Describing the location; general layout; size, capacity, etc.; preconstruction activities; project / construction history, construction activities; schedule, Institutional arrangement and responsibilities – thus; staffing and support; facilities and services; operations; required off-site investments; life span.
- c) Describing the baseline conditions in the project area of influence to cover the physical location, environmental setting, social and economic issues.
- d) Describing valuable and or vulnerable environmental, social and cultural assets in the project

area, which may be at risk.

- e) Specifying through maps at appropriate scales, the boundaries of the study area for assessment as well as surrounding areas likely to be environmentally affected.
- f) Describing the relevant trends within the project area for potential cumulative impacts. Including the description of ESIA methodology used.
- g) Providing the summary of review of review existing studies and available data and taking into account current and proposed development activities within the project area but not directly connected to the project.
- h) Explaining the sources, accuracy and reliability of relevant data for decisions making about project location, design, Materials to use, technology, operations, and/or mitigation measures.
- i) Identifying data gaps and areas not covered by appropriate studies, using good international practice - World Bank as benchmarks. Propose actions to close such gaps, including costs and time estimates.
- j) Describing the legal, policy and institutional framework within which the proposed Sub projects will be implemented. This section shall include local, national and international laws and standards applicable to the proposed project.
- k) Detailed assessment of the anticipated impacts to the environment (biophysical social and economic) aspects of the area covered by the project. Impacts and scale will include analysis of Land ownership and availability, Loss of income/assets, SEA/SH risks, Child and forced labor risk, presence of communities meeting ESS7 criteria and specific requirements, Occupational health and safety risks, Community health and safety risks, sanitation and waste management implications by the project.
- l) Indicating the scale of impacts, whether the identified impacts are irreversible or reversible, permanent or temporary, direct or indirect, large scale or local to project site. Identify residual impacts of this project, which cannot be avoided or mitigated.
- m) Addressing issues connected to climate change and climate variability, investigating matters such as methane gases emissions from the sewer works
- n) Outlining and considering potential scenarios and their impact on operation. possible Describing the impacts quantitatively, in terms of environment costs and benefits and assign economic values where possible.
- o) Analysis of the project alternatives and selection criteria in terms of siting, design, technology selection, construction techniques and phasing, degree of associated environmental and social impacts, and operating and maintenance procedures.
- p) Description of proposed **impact mitigation** and/or corrective measures for each impact identified
- q) Developing an Environmental and Social Management Plan (ESMP) presenting the project activities, potential impacts, mitigation actions, timing, targets and responsibilities, associated costs and monitoring indicators.
- r) Developing **ESIA Implementation Budget**: provide a clear statement of financial responsibilities, identify summary of costs for implementation of the proposed mitigation measures; provide detailed estimated budget for all phases of the project including planning, implementation, monitoring and evaluation, with contingencies.
- s) Record all **public consultations** and other records that will indicate participation of interested and project affected parties (PAPs) throughout the ESIA study process, including: surveys used to seek views of affected stakeholders; date and location of consultation meetings; a list

of attendees, their affiliation, contact addresses and a summary.

- t) Separate record of consultations with VMGs, youth, female beneficiaries and communities meeting the requirement of ESS7. This section needs to present an approach to ongoing stakeholder engagement. In addition, a Grievance Mechanism will be described in this section.
- u) Attaching all the requisite documents and records e.g Topographical, architectural and structural drawings, land ownership among others as shall be guided by the project

1.6 Scope of the study

The Kenya Government and the World Bank policy on all proposed facilities, activities and programmes requires that an environmental and social impact assessment study be done to provide baseline information upon which subsequent environmental control audit studies and world bank environmental and social monitoring shall be based. This ensures that significant impacts on the environment and the surrounding communities are taken into consideration at all times during the operations of the respective project. The scope of this SPR, therefore, covered description of the project

- Determination of how far the operation of the curing and product store will impact on the environment.
- The study and description of the activities of the curing store, product store and dryer, and identification of all the impacts it has on both human and natural environment.
- The review of the project operating activities to ensure that the intended mitigation measures have been properly implemented.
- The description of the health and safety issues of the organization members, the local community and other potentially affected groups.
- The description of monitoring programs, parameters and procedures in place for control and corrective actions in case of emergencies.
- The provision of evidence of public consultations
- The design of an environmental management plan which the organization management group will use to implement the proposed mitigation measures in order to improve the environmental quality.

1.7 ESIA Approach and methodology

1.7.1 Environmental Screening and scoping

The Consultant first undertook environmental screening and scoping to identify pertinent issues for coverage in line with the TOR and to complement the World Bank ESS screening checklist findings. ESS Standards that NAVCDP are aligned to include: ESS1 Assessment and Management of Environmental and Social risks and Impact, ESS 2 Labour and Working Conditions, ESS 3 Resource Efficiency and Pollution Prevention Management: on Labour and working conditions. ESS 4 Community Health and Safety, ESS 5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement, ESS 6 Biodiversity Conservation and Management of Living Natural Resources, ESS7 Indigenous Peoples/ Sub Saharan African Historically Underserved Traditional Local Communities, ESS 8 Cultural Heritage (IPs/ SSAHUTLC) and ESS 10 Stakeholder Engagement and Information disclosure. According to the World Bank Environmental Social framework risks are categorized as High, Substantial, and Medium & Low.

The magnitude of the investments is small - medium, temporary, site specific, predictable but reversible. The project is found to be medium risk.

An Environmental and Social Safeguards screening checklist was applied resulting in the classification of the project as a 'B' category project (see Annex 6) in line with considerations of NEMA Legal Notice No 31 on the Amendment of the Second Schedule of EMCA 1999. The County Director Environment Siaya recommended a summary report to be conducted for the proposed construction of a curing, product store and dryer project

1.7.2 Environmental Scoping

The purpose of the scoping was to determine the intensity of the expected environmental impacts and the people likely to be affected. In the study, environmental scoping involved evaluating the expected environmental impacts and discussing them with relevant stakeholders to determine their views on the same

1.7.3 Desktop study

Desktop study included documents review on the nature of the proposed activities, project documents including designs, policy and legislative framework as well as the environmental setting of the area among others. Key documents reviewed included the following: Kenya policies, strategies and guidelines; National and County Laws and regulations; applicable Multilateral Environmental Agreements (MEAs) and World Bank policies on ESS. This was complemented with discussions with managers, Quantity surveyors and design engineers and interview with community.

1.7.4 Public consultation

a) Physical inspection of the site and surrounding

Physical inspection of the proposed site which included field investigation at site and surrounding areas was done on 31st March 2025. At the visited sites, documentation on geology, soil characteristics and landscape were recorded. Photographs at selected sites were taken for inclusion in this report to further emphasis these observations. The field investigations were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts from the project. It also included further interviews with the community and key stakeholders.

b) Consultation and Public Participation

The ESIA experts, in consultation with NAVCDP, Siaya team sought the views of persons who may be affected by the proposed project. The public consultations were preceded by the identification of stakeholders and project affected persons. Public meetings were undertaken at the proposed site and the project area, evidence photos attached (*Annex 11*). During the meeting held on 31st March, 2025, there was attendance of about 40 participants of which 24 were men and 16 were women (*Annex 3*). The record of minutes is provided in *Annex 2*. To ensure adequate public participation in the ESIA process, at least 15 questionnaires were administered (*Annex 1*). The information gathered was subsequently synthesized and incorporated into the ESIA summary project report. This was done in order to incorporate the concerns and views of all persons and individuals in the project neighbourhood.

c) Observation Methods

This was to assess and quantify environmental risks posed by the proposed project. The application of this technique was based on the experts' long-term knowledge and experience in environmental impact assessment and environmental management.

d) Photography

The EIA/EA expert took photos of the site to document the local environment including vegetation cover, existing structures, area topography, and infrastructure.

1.7.5 Reporting

The Environmental Impacts Assessment report was compiled from the findings in accordance with the EIA guidelines issued by NEMA for Summary Project Report. The Consultant ensured constant briefing of the proponent during the exercise. The exercise culminated with the production and documentation of this summary project report, which will be submitted to NEMA for review and approval.

1.8 ESIA Team

Lead expert	Fredrick Aloo
Quantity surveyor	Edwin Oswaga
Sociologist	Diana Awuor
County Engineer	Kevin Obiero
Agricultural economist	Elijah Luavo

1.9 Project Implementing agency/structure

The implementing agency is National Agriculture Value Chain Development Project (NAVCDP). The project is under the Ministry of Agriculture and Livestock Development, State Department of Crops. NAVCDP is being implemented in 34 Counties, and Siaya County is being one of them. The aim of the project is to increase market participation and value addition for targeted farmers in 16 prioritized value chains.

The project has three components, namely:

Component 1: Building Producer Capacity for Climate Resilient Stronger Value Chains

Component 2: Climate Smart Value Chain Ecosystem Investments

Component 3: Piloting Climate Smart Safer Urban Food Systems

The proposed construction activity of rice curing store, Rice product store and dryer falls under component 2. Component 2 of the project (Climate smart value chain ecosystem investments) has four (4) sub-components, of which two (2), namely Farmer-Led Irrigation Development (FLID) and Market Access and Infrastructure Development (MA&ID), are infrastructure based. FLID aims to contribute towards increasing the production and productivity of priority agricultural value chains to ensure adequate volumes for markets and for value addition/processing. Investments in FLID include water pans, earth dams, small-scale community irrigation schemes, and sustainable land management/natural resource management investments. On the other hand, MA&ID investments aim to reduce post-harvest losses, improve the quality of agricultural products marketed, and ultimately result in profitable value chains. Possible investments include commodity markets, agro-processing plants, and infrastructure for other forms of value addition.

In both cases, investments could be new or rehabilitation/modernization/upgradation of existing infrastructure. MA&ID investments will involve FPOs or 4Ps arrangements.

1.10 Structure of the Report

The report structure is organized in 9 chapters. Chapter 1 covers the general introduction of the project and its relation to the NAVCDP project. In chapter 2, a description of the nature of the project is given covering what the project entails. Chapter 3 describes the location of the project and its surrounding. Chapter 4 addresses the legal framework and how it is linked to the project activities. Public participation and stakeholder engagement description and methods used to reach them is described in chapter 5. Project Alternatives is described in Chapter 6, A description of potential impacts and mitigation measures foreseen in the project is provided in chapter 7. Chapter 8 gives a table that describes the Environmental and Social Management & Monitoring Plan (ESM&MP) that will be implemented by the project. Chapter 9 sums up the conclusion and recommendations for the whole assessment. References and Annexes have been included respectively.

1.11 Study Methodology

This assessment was carried out in March and April 2025 in accordance with the procedure outlined in the Environmental (Impact Assessment and Audit) Regulations, 2003 (Revised 2019) and involved:

- a) **Screening:** The site of the proposed project, the environmental sensitivity of the surrounding areas, the nature and scope of the proposed activities, and the characteristics of the host community, including anticipated social issues, were evaluated to determine whether the project falls within a category requiring an Environmental and Social Impact Assessment (ESIA) prior to commencement, and to establish the appropriate level of assessment to which it should be subjected.

A screening checklist for the proposed project is attached in *Annex 6*. Furthermore, according to the Legal Notice No. 31, Legislative Supplement No. 16 published in the Kenya Gazette Supplement No. 62 on 30th April 2019 i.e. Amendment of the Second Schedule which lists the projects to undergo EIA [Section 58 (1) of EMCA, 1999 (Revised 2015)], this project is categorized as a Low-Risk and, therefore, requires to be subjected to ESIA.

Site visits to physically inspect and document existing facilities at the site and natural and socio-economic features of importance.

- b) **Scoping:** The ESIA team accompanied by officials from NAVCDP Siaya County team conducted a reconnaissance survey at the site. This survey was done in order to narrow down to the most critical environmental and social issues requiring detailed evaluation.
- c) **Public participation:** This was done through a meeting with members of Usonga Rice Producers Cooperative and other beneficiaries including the neighbouring residents where a total of 20(9F,11M) people attended; questionnaire interviews conducted in 15 households as attached in *Annex 1* ; and a stakeholder consultation meeting with representatives from

NAVCDP Siaya, NEMA Siaya, and officials of the Usonga Rice Producers Cooperative. The technical team conducted free, prior informed consultation with all groups within the community. These included the adult males and females as well as male and female youth from all the communities in the village. Their responses were captured using structured public stakeholder consultation checklist. Copies of the completed public stakeholder checklists are attached at the end of this report (see annexes. The lists of attendance and the minutes of the public meeting are also attached annexes

- d) **Desktop studies:** The ESIA team reviewed documents related to the proposed project including the proposal by the community and design documents among other documents in order to understand the project background and its context. The experts also reviewed relevant policies and legislation, the Siaya County Integrated Development Plan (CIDP) and literature on the environmental setting of the area and case studies of similar projects.
- e) **Observation** In all the areas visited during the data collection exercise, unstructured observations were made in the study locality. Notable issues of concern such as cultural materials, economic, livelihoods and production systems, land use and settlement patterns and facilities and natural resources were captured using a camera.
- f) **Data Analysis and Report** writing Quantitative data was entered into excel spreadsheet and run to obtain basic frequencies and information regarding the key variables of concern to the social assessment study. The qualitative data (KII) was transcribed and audited. It was then analysed using content analysis and category building and grouping which enabled the developing of themes in line with the objectives of the social assessment.

The main limitation to the assessment was lack of existing adequate and reliable information that left the team with no option but to rely on responses from stakeholders and the Usonga Rice Producers Cooperative. The consultant has evaluated information obtained within the limits of the established scope of work.

2 PROJECT DESCRIPTION

2.1 Introduction

This chapter gives details of the project design. It highlights the project design and materials supported by design and plan drawn to scale and signed by an engineer. Additionally, it provides an overview of project activities during construction, operation and decommissioning phases. Included is a proof of land ownership and a description of any existing environmentally sensitive areas and description of the project area

2.2 Project Location

The proposed site for the construction of rice curing store and product store is in Siriwo Uasi Village Usonga Ward Alego Usonga Sub County. The area lies in GPS Coordinates Latitude S 0.084594, Longitude E 34.082015. The project is community led and targets to transform the rural livelihoods of the rice farmers. It is situated on land under Siaya County Council Title No Usonga/SUMRA/1294 1.94ha (*Annex 5*) The land was originally designated for construction of a cattle dip by the county government, however a request for change of use have been written to the county national land commission office and was accepted. The land is in a swampy area where there have been cultivation of irrigated rice. The proposed site is about 3 km away from the Siaya-Nyadorera tarmac road.

The nearest hospital is Uasi dispensary which is 1 km away. The Usonga Sub county hospital is east of the project site about 4 to 5 Km away. The nearest primary school is Uasi primary school and is 100 meters from the project site. The office of the chief is about 1Km away from the proposed site

2.3 Project Design

The design calculations were done based on the size of curing store and product to be stored and the quantity of raw materials required for milling machine (*See Annex 4, Annex 12, Annex 13, Annex 14 and Annex 16*)

To develop the design, sizing of Curing and Product Stores had was done as indicated below:
Available Paddy

- Annual Paddy Harvest = 3,317 MT in 2 harvesting seasons
- In 1 harvesting season, therefore, approximately 1,660 MT harvested
- Assuming 10% Harvesting losses (conveyance, spillage losses), then approximately 1,500MT available for processing per season
- Paddy bulk density varies between 522 – 650 kg/m³
- Assume a 522 kg/m³ paddy bulk density (for dried paddy)
- Therefore, this a volume of 2,874m³

Curing Store Space Requirement

- Sun-dried paddy, at 14% moisture content, requires to be cured for 3 months in the curing store to achieve 12% moisture content, suitable for milling.
- Assuming a building height of 5.5m, yields a required floor area requirement of 523m²
- Adjusting for a loss of storage volume of 27% for alleyways, results in a required floor area of 664m².

- Therefore, with a height of 5.5m, then storage volume required is 3,652m³
- Therefore, adopt a curing store of **45m length x 15m width x 5.5m height** to give a volume of 3,700m³

Processing Requirement

- Existing rice mill processing capacity = 2.5MT/ hr
- Assume 8-hour per day processing, yields 20MT/day processed
- This is a volume of 38m³ required to be processed daily
- Therefore, the entire paddy harvest (2,874m³) requires approximately 76 milling-days
- If 1 month has 25 milling-days, then the harvest can be milled in 3 months and stored for bulk marketing

Product Store Requirement

- Assuming a recovery rate of 10:7, then 1,500MT of paddy yields 1,050MT of white rice.
- With a bulk density of 770kg/m³, this translates to 1,363m³ (Approximately 1,400m³)
- Assuming a 5.5m height of store, then the floor area required is 255m²
- Adjusting for 27% alleyways, the new required floor area is approximately 324m² with a volume of 1,783m³
- Rice husks constitute approximately 20% of weight of paddy rice (300MT) and need to be stored. With a bulk density of 150kg/m³, then it would require approximately 2,000m³
- Therefore, total storage requirement is 3,783m³.
- Therefore, adopt a product store of **45m length x 15m width x 5.5m height** to give a volume of 3,700m³

Design Considerations for Solarisation / Hybridisation

The design process for solarization project is as follows;

a)Load calculations

Load Type	Quantity	Wattage Per Unit(KW)	Total Load(W)
Paddy Pre Cleaner	1	0.25	250
Paddy Destoner	1	0.25	250
Paddy Dehuller/Husker	1	5.5	5,500
Gravity Paddy Separator	1	1.1	1100
Emery Roller Rice Mill	2	22	44,000
Iron Roller Rice Mill	1	15	15,000
Water Polisher	1	44.5	44,500
First Rice Grader	1	1.1	1,100
Final Length Grader	1	1.1	1,100
Colour Sorter	1	9.7	9,700
Weighing And Packaging Machine	1	1.1	1,100
Elevator	14	0.75	10,500

Air Compressor	1	11	11,000
Pre Cleaner	1	3	3,000
Husker	1	3	3,000
Centrifugal Fan(Water Polisher)	1	7.5	7,500
Centrifugal Fan(Rice Mill)	1	11	11,000
TOTAL			169,600W

From the load calculation, Energy (kWh) assuming 8 hours of operation per day

Energy (kWh) = Power (W) x Time (hours)

$$= 169,600 * 8 = 1356.8 \text{ kWh/day.}$$

b)Solar Panel Sizing

Assuming 5 peak sunshine hours

The System size (KW) = $\frac{\text{Daily Energy Consumption}}{\text{Peak sun hours}}$

$$1356.8/5 = 271.36 \text{ kW}$$

Total panels required considering a 550W solar panel

$$\frac{271,360}{550} = 493 \text{ solar panels.}$$

550

Due to budget constraints, 200 solar panels will be procured in the first phase of implementation.

2.4 Project Activities

2.4.1 During Construction Phase

a) Planning Phase Activities

The main activities considered during this phase are: community mobilization, tendering services as required by procurement regulations, site hand over, hand over of drawing and building plans and site layout.

b) Mobilization and construction works

Site mobilization includes the stepping up of a camp for construction works and transportation of machinery to the site for excavation works. This stage of the project will also involve clearing of vegetation i.e trees and shrubs to allow for excavation of the foundation

c) Earthworks

After clearing any existing vegetation, the soil will then be excavated. Excavators will be sought to the site to remove the soil. The contractors will recycle the excavated soil as much as possible due to the topography of the proposed site. Since the compound is large enough (approx. 5 acres) any extra soil will be used for landscaping

Earthworks will involve excavation of soils for the foundation; this will be done with an aim of achieving the desired foundation for the storage capacity of the stores

d) Construction works

Construction works will majorly involve construction of auxiliary structures that go along with rice stores

e) Installation of Solar infrastructure

Pumping of water from the intake will be by use of solar which is green energy. This therefore means that there should be installation of solar infrastructure at site. Solar will also be used to light to boost security on the site.

Required inputs

The project inputs include the following:

Construction raw materials i.e sand, cement, stones, clay materials among others. All these should be obtained from within

Construction machines including machinery such as trucks, concrete mixers, and tools and other relevant construction equipment. The equipment will be used for transportation of materials clearing of the site and construction debris. Most of machinery will use petroleum products to provide energy

A construction labour force of both skilled and non-skilled workers

Solar technology infrastructure

f) Construction of paddy curing store

- ✓ Sub-structure works
- ✓ Super-structure works
- ✓ Roofing structure/cover and water disposal
- ✓ Fittings – doors, windows and rodent/pat/bird proofed ventilations
- ✓ Finishes and decoration works
- ✓ Installation of wooden palettes
- ✓ Installation of mechanical ventilations and wind powered cyclones
- ✓ Site levelling and landscaping works
- ✓ Drainages and storm water control systems

g) Construction of product store

- ✓ Sub-structure works
- ✓ Super-structure works
- ✓ Roofing structure/cover and water disposal
- ✓ Fittings – doors, windows and rodent/pat/bird proofed ventilations
- ✓ Finishes and decoration works
- ✓ Installation of wooden palettes
- ✓ Installation of mechanical ventilations and wind powered cyclones
- ✓ Site levelling and landscaping works
- ✓ Drainages and storm water control systems

h) Equipping of product store

- ✓ Purchase and supply of folk-lift (3tones)
- ✓ Purchase and supply of digital weighing scale
- ✓ Purchase and supply of Aflatoxin test kit

i) **Electrification and power connection to the stores**

j) **Additional construction works proposed are as follows:**

- **Road Networks and Drainage System:** Develop comprehensive road networks integrated with an efficient drainage system to enhance accessibility and water management.
- **Electrical Works:** Ensure the inclusion of electrical systems in both the paddy and product stores to facilitate smooth operations.
- **Drying Facilities:** Provide a solarized dryer, a flat-bed paddy dryer, or a shed solarized dryer to enhance the drying process.
- **Sanitation Infrastructure:** Include modern washrooms or well-designed ablution blocks to support hygiene and sanitation needs.
- **Mechanical Components:** Incorporate appropriate mechanical components to optimize operational efficiency.
- **Water Harvesting:** Install water harvesting tanks to aid in sustainable water management.
- **Workspace Provisions:** Allocate space for work areas during the construction phase to ensure seamless operations outside the perimeter walls.

The following

2.4.1 Materials used for construction

i. Sub-Structures

- Foundation on unstable swampy black cotton soils
- Incorporate column bases/pads, stud columns, strip footings and ground beams
- Foundation Walling - Rough dressed natural stones, High yield deformed bars to B.S.4449, Mesh fabric reinforcement to B.S 4483 B.R.C A142 and Expansion Joints
- Paving slabs for water management

ii. Super-Structures

- fairly dressed stone walling; bedded in cement /mortar 1:3 and reinforced with medium gauge hoop-iron at 2 alternating courses
- H/I-Section Steel Columns/Beams/Roof Supports
- high yield R.H.S sections bracings; bolted to steel columns and trusses
- steel strainers bolted to roof purlins at intervals
- high yield steel Z-Purlins; spaced and welded to trusses
- Steel plate welded to steel columns in an slanting/overlapping pattern forming permanent ventilations; complete with gauze wire all round and above doors
- 28G IT5 Box profiled walls/roof cover fixed with rubber washer match and J-bolts on 100 x 75 x 2mm Z-purlins (m/s)
- galvanized fascia/barge boards; soldier-jointed
- Ridge Cap
- boxed gutter: soldier-jointed at straight joints and fixed with metal brackets at 1000mm (minimum) centres; complete with primer paint to steel surfaces
- Office space for record-keeping

iii. Doors/Finishing Works

- gauged plaster cement sand lime 1:1:6 with a smooth float to internal surfaces of walls
- vertical and horizontal wall pointing to external surfaces of protective walls
- three coats of emulsion paint to plastered wall surfaces
- first grade steel plate double sliding doors c/w all accessories
- Purpose made steel plate door
- Purpose made steel window
- three coats of gloss paint to steel door surfaces
- floor screed backing to receive Terrazzo and floor finishes appropriate falls and cross-falls
- polished Terrazzo finish with & including plastic dividing strips at approved intervals finished smooth to appropriate falls and cross-falls
- Supply and lay wooden plank pallets; in floor levels

2.4.2 Project Activities during operation phase

- During operation phase the following activities will be undertaken:
- Receiving of paddy from the field
- Weighing of the paddy
- Measuring of initial moisture content
- Testing of aflatoxin contents
- Drying
- Measuring of the current moisture content should be around 13%
- Milling
- Finally, the milled rice will be delivered to the product store

2.4.3 Project management activities

The members of the cooperative society management committee, which will be selected from the community members, will manage the curing store and product store. This committee will be responsible for coordinating overall operation and maintenance of the two stores.

This involves solving conflicts that may arise from the project operations carrying out repairs and maintenance among other duties

2.5 Waste to be generated and method of disposal

2.5.1 Effluent Waste

Effluent waste will emanate from construction works (mixing of aggregate, cleaning) mobile toilet facilities that will be used by workers while at work among others. Wastewater will also emanate from activities related to washing/cleaning of equipment and vehicles. During operation effluent waste is going to emanate from the workers on site (Washrooms and administrative blocks).

Sewage generated will be discharged into biodigester. The existing toilets will also be connected to the biodigester while the storm water drainage system will also consist of network of inverted block drains which will discharge into the pen.

2.5.2 Solid Waste

Construction solid waste will comprise of general domestic waste including sanitary food waste, office waste, organic material, small volumes of waste arising from milling plant, chiefly waste lubricating oil and packaging materials (e.g cement bags). Human waste will also emanate from the construction workers on site (will require mobile toilets). Construction waste will include among others construction packaging materials (cement bags, packaging waste)

No significant solid waste streams are expected during operation other than sewerage wastes and domestic wastes from the activities although a waste receptacle will be designated for solid waste management

2.5.3 Gaseous Emissions

The use of motorized equipment during construction will generate gaseous emissions in the project area of influence. Motorized vehicles and equipment including trucks, excavators etc. will generate exhaust fumes. Dust will also be generated by movement of motorised vehicles.

During the decommissioning phase the primary waste will be from the motorized equipment and machinery. Trucks will be required to transport wastes generated through the decommissioning phase to appropriate waste disposal sites. These vehicles will consume diesel and produce air emissions as a waste. Secondly through servicing of these trucks, used oils will be generated which are hazardous wastes

2.5.4 Noise Emissions

The use of motorized equipment during construction will generate noise emissions in the project area of influence. Motorized vehicles and equipment including trucks, excavators etc will generate noise during construction and decommissioning phase of the project. Construction phase noise will be generated by construction plant and equipment such as excavators, lifting equipment, dumper trucks, compressors, generators etc. Construction plant and equipment will be maintained in accordance with the preventive maintenance schedules in the manufacturer's instructions to ensure that such equipment does not produce excessive noise and vibration. During operation, there are no noise emissions that will be generated by the project other than from the vehicles that will bring materials into and outside of the facility.

During decommissioning phase noise levels will be generated, equipment such as excavators lifting equipment, dumper truck, compressors, generators etc. Machinery and equipment will be maintained in accordance with the preventive maintenance schedules indicated in the manufacturer's instructions to ensure that such equipment does not produce excessive noise and vibration.

2.6 Project sustainability

The project cooperative management committee will develop by-laws to operationalise the facilities. This involves introduction of fees for repairs and maintenance of the stores. The Committee also will initiate projects that will benefit the community directly while raising money for maintenance of the rice storage facility. For purposes of environmental conservation the committee will establish a tree nursery and sale to the community members and beyond and this will raise money for maintenance. At later stage they will engage in packaging and selling of the rice and rice products

3 POLICY LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 Introduction

Environmental Impact Assessment takes place within the legal and/or policy and institutional frameworks established by individual countries and international agencies. ESIA provision and procedure can contribute to the successful implementation of the proposed project if all the parties involved in its implementation follow the frameworks.

3.2 Relevant Policies

There are a number of policies that are pertinent to this project, the main overarching policy is the constitution of Kenya. Below is a summary of policies

3.2.1 Kenya Constitution 2010

The Constitution of Kenya 2010 is the overarching law. Article 43 deals with economic and social rights and includes the right to clean and safe water in adequate quantities as a fundamental human right. Article 42 states “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, and b) to have obligations relating to the environment fulfilled under Article 70”.

In respect to obligations concerning the management of natural resources the constitution has enshrined the principle of public participation that has been complied with in this SPR. The Proponent by this SPR has taken precautionary measures to make certain that the proposed project contributes to a clean and healthy environment.

3.2.2 Vision 2030

Vision 2030 is being implemented through a series of five-year Medium-Term Plans (MTP). The MTP identifies the key policy actions and programs for each Ministry Department and Agency (MDA). 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. Kenya vision 2030 includes equity as a recurrent principle in economic, social and political programs. 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 rice curing and product store is an effort to contribute to economic and social benefits by providing access to market and increased income to rice farmers by reducing post-harvest losses.

3.2.3 National Gender and Development Policy, 2000

The State Department for Gender in the Ministry of Public Service, Youth and Gender is responsible for promoting gender equality and empowerment of women in Kenya. The Department has developed the National Gender and Development Policy as a review of the Gender

Policy adopted by the cabinet in 2000. The policy outlines the national agenda for gender equality and how Kenya intends to realize these ideals.

The Constitution of Kenya creates a platform for gender equality and non-discrimination. It highlights such principles as equality, equity, inclusiveness and non-discrimination.

This Policy will be actualized during project implementation especially during hiring of staff, procurement of suppliers and sub consultants. The policy addresses the need to achieve equal opportunity and outcomes with respect to access to and control of national and county resources and services; and equality of treatment that meets the specific and distinct needs of different categories of women and men

3.2.4 Policy on Gender and Sexual Based Violence 2017

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 project proponent has put in place plans through the ESMP to develop and implement a SGBV action plan with an Accountability and Response Framework as required by of this policy

3.2.5 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 rice curing store and product store project will provide direct employment to the youth as required by the Policy.

3.2.6 Wetlands policy

The policy acknowledges that wetlands are highly productive ecosystems and that they perform many functions that maintain the ecological integrity of the system and also provide many goods and services. The policy also underscores the functions and benefits provided by wetlands and their significance for the general public as they support agriculture, tourism, industry and biodiversity, conservation, social economic and cultural activities. The policy decries deterioration of wetland

The proposed site for the project is within a swampy wetland area. The proponent must protect the vegetation around the project site around and take cognizes of the existence of the wetlands in the area

3.3 Institutional framework

3.3.1 National Environmental Management Authority

The Environmental Management and Coordination Act (EMCA) 1999 (Cap. 387) Revised 2015 provides for establishment of the National Environment Management Authority (NEMA) as the principal agency responsible for coordination, monitoring and supervision of environmental issues in Kenya. The Authority too has a cross-sectorial mandate to oversee the conduct of environmental assessments and audits through issuance of guidelines, regulations and registration of environmental practitioners. It reviews and approves reports for environmental assessments and audits in consultation with relevant lead agencies.

The National Environment Management Authority (NEMA) enforces environmental legislations through the Department of Compliance and Enforcement which is responsible for ensuring that

projects comply with the various environmental regulations and standards. The Authority has appointed environmental inspectors whose powers and duties are listed out under section 117 of EMCA, 1999 (Cap. 387) Revised 2015. The environmental inspector may also issue an improvement notice requiring an operator to cease any activity deleterious to the environment which is contrary to the Act. The Authority has power, to prosecute environmental offenders and offences committed under the Act and may earn the offender fines and prison sentences. It works with the county environment departments and committees at the county level in undertaking inspection, monitoring and compliance enforcement.

The National Environment Management Authority (NEMA) in consultation with lead agencies will review and approve this ESIA report or advise the Proponent. County environment officers represent NEMA at the county level and are responsible for monitoring environmental protection or regulatory compliance at the county level.

3.3.2 Environmental liaison units in other institutions with environmental management mandates in Kenya

The National Environment Management Authority (NEMA) is linked to sectorial lead agencies, private organizations and educational institutions through their environmental liaison units. These institutions include county environment departments, parastatals, learning institutions, NGOs and CBOs among others and are charged with implementation of environmental programmes and integration of environmental concerns in sectorial policies, plans and programs. Consequently, they monitor investment programmes at their respective sectorial levels.

Relevant environmental liaison units in other relevant ministries and departments such as Siaya County Ministry of Agriculture, Livestock, Fisheries and Cooperatives among others will give their inputs/ comments in the final ESIA before NEMA issues a license for the project to commence.

3.3.3 Water Resources Authority (WRA)

The objective of WRA is to protect, conserve, control and regulate the use of water resources through the establishment of a national water resource strategy. In addition, the WRA is responsible for: formulation and enforcement of standards, procedures and regulations for the management and use of water resources; policy development; planning and issuing of water abstraction permits; and setting and collecting permits and water use fees. As per the requirement of the Water Act (No. 43 of 2016), *the proponent will apply for the water use and works permit from WRA.*

3.3.4 Irrigation Water Resource Users Association (IWRUA)

IWRUAs are local community institution established under the Irrigation Act which works with WRA to manage water resources at the grass-root level. *The proponent in the ESMP will support the formation and capacity building for the IWRUA to enhance sustainable management of the project. The National Irrigation Authority being the custodian of dykes and canals in the irrigation scheme will provide guidance on water extraction and use in the Lower Nzoia Irrigation Scheme*

3.4 The Legal Framework

3.4.1 Environmental Regulatory Framework

3.4.1.1 EIA regulations 2003 (ESIA and EA regulations)

The prescribed format for Environmental Impact Assessment guidelines in Kenya has been developed and gazetted. The regulations require that EIA cover issues outlined in the schedule 2nd 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.

By this ESIA SPR the requirements of these regulations and those of the World Bank were integrated and followed throughout the process. The proponent shall prepare an Environmental and Social Assessment (ESIA) Report by engaging a licenced NEMA Expert(See Lead expert practising License in Annex 8). The ESIA Report will be licensed by NEMA before work commences (See Annex 7)

3.4.1.2 Environmental Management and Coordination (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulation, 2009.

This Act applies to all wetlands in Kenya whether occurring in private or public land. It contains provisions for the utilization of wetland resources in a sustainable manner compatible with the continued presence of wetlands and their hydrological, ecological, social and economic functions and services.

This ESIA is conducted in compliance with Section 5(1) (b) of these Regulations, which require ESIA and environmental audits for all activities likely to have adverse impacts on wetlands.

This ESIA has outlined measures that the Proponent will put in place to ensure that aquatic life in the dam is not compromised. These measures include fencing the dam site to keep away trespassers who might jeopardize the dam waters.

3.4.1.3 Environmental Management and Coordination (Waste Management) Regulations, 2006

According to part II of the regulations, a generator of waste should:

- a) Not dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle;
- b) Collect, segregate and dispose or cause to be disposed-off such waste in the manner provided for under these Regulations; and
- c) Ensure that the waste is transferred to a person who is licensed to transport and dispose-off such waste in a designated waste disposal facility.

All wastes from the proposed site will be managed in accordance with the procedures outlined in this report or as may be advised by the public health office and/or other authorities. The Proponent and contractor(s) will ensure that there is no environmental damage or nuisance resulting from wastes from the proposed project and site by regularly collecting and disposing the wastes.

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

These Regulations state that no person shall engage in any activity that may have an adverse impact on any ecosystem, lead to the introduction of any exotic species, or lead to unsustainable use of natural resources, without an EIA license issued by the Authority under the Act.

The Proponent has commissioned this environmental assessment study and seeks to obtain an ESIA License from NEMA in compliance with these Regulations. The ESMP included in this report provides guidelines for the mitigation of potentially adverse impacts on natural resources. It should be noted that there are no species and ecosystems of biological importance in the area.

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

These regulations prohibit under Section 3 (1) the causing of loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.

According to these regulations, Day means the time between 0601 hours and 2000 hours while night the time between 2001 hours and 0600 hours. In compliance with these regulations:

- a) There will be no construction at night.
- b) Earmuffs will be provided to workers during construction.
- c) Regular maintenance/repair of contractor's vehicles and machinery will be enforced to minimize vibrations and noise.
- d) Any maintenance of construction vehicles and machinery will be carried out in the contractor's yard that may be onsite or off site.

All noise to be produced at the proposed site in all its phases shall be managed in accordance with the guidelines in this report or from other authorities in control of noise. The Proponent and contractor(s) shall ensure that there is no noise and vibration nuisance resulting from the proposed project.

3.4.1.6 Environmental Management and Coordination, (Water Quality) Regulations, 2006

These Regulations apply to drinking water, water used for industrial purposes, water used for agricultural purposes, water used for recreational purposes, water used for fisheries and wildlife, and water used for any other purposes. Section 4 of the regulation focuses on the protection of sources of water by preventing any form of pollution.

Section 6 (1) of the regulation requires an EIA license issued in accordance with the provisions of the Act for the abstraction of ground and surface water. The Proponent has complied with this regulation by undertaking this ESIA SPR which has determined possible activities that may affect the quality and quantity of water during the construction and operation phases in the project context. Mitigation measures have been provided for all the predicted impacts on water quality. *The design of the store also provides for pollution prevention. The proponent and all other parties (including project beneficiaries) shall fully comply with the requirements of these regulations to ensure that its objectives are achieved. The proponent will undertake a water quality analysis to determine the safety of the water for use in cleaning and running the store.*

3.4.1.7 Environmental Management and Coordination Act (Air Quality) Regulations, 2014

The objective of these regulations is to provide for prevention, control, and abatement of air pollution to ensure clean and healthy ambient air. The regulations provide for compliance with emission standards for various sources of air pollution including mobile sources (e.g. motor vehicles) etc. as outlined in the Environmental Management and Coordination Act, 1999. The proponent in this ESIA SPR has identified all sources of air pollution and provided adequate mitigation through the ESMP. The proponent will ensure compliance with air quality regulations by enforcing all the proposed preventive and mitigation measures in the ESMP such as sprinkling of on loose soils, soil piles and use of dust masks by the workers among others.

3.4.2 The Public Health Act (Cap. 242)

Part IX, 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. Work areas should be clean and sanitary to prevent the occurrence of nuisance or condition liable for injurious or dangerous to human health. *The proponent through this ESIA SPR and the ESMP has defined the necessary measures 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.*

3.4.3 Physical Planning and Land Use Planning Act, 2019

The objectives of the Act are to provide the principles, procedures, and standards for the preparation and implementation of physical development plans at the national, regional, county, urban, and rural and cities level and provision of the procedures and standards for development control and the regulation of physical planning and land use.

The proposed project is in line with the proposed land use for the project site and compatible with the existing uses. The county government through department of lands have undertaken an assessment of the area and confirmed the applicability of the stores in the proposed site

3.4.4 The Occupational Health and Safety Act, 2007

The Occupational Safety and Health Act, 2007 require that workplaces be kept safe for workers therein. Workers who are exposed to wet or any injurious or offensive substances are required under Section 101 of the Act to be provided with suitable protective clothing.

In the ESMP the proponent has put in place measures to be observed by the contractor during the construction phase of the project to ensure the health and safety of workers. Examples of suggested measures include provision of appropriate PPEs, first aid kits, training on first aid etc. The Bid document also places the responsibility of ensuring safety in the work place during construction on the Contractor.

3.4.5 Employment Act, 2007

Section 3. (1) States that this Act shall apply to all employees employed during the sub-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 through the contractor will make sure that fairness and gender equity are followed during recruitment of the labour force to be used during the construction phase and other project cycles when necessary.

The bid document binds the contractor to ensure fairness during recruitment of workers in the project. Locals will be given preference in labour, works. Women and youth will be offered opportunities in the project. Both male and females will be considered for employment.

3.4.6 Work injury benefits Act, 2007

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

In this SPR the proponent through the ESMP has outlined appropriate measures (such as provision of first aid kits, PPEs, training of workers in first aid and monitoring of OHS through DOSH among others) to address adverse effects that may occur from the project 's activities in the construction, operation and decommissioning phases.

The bid document has indicated the Contractors responsibility including ensuring safety.

3.4.7 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 for the proposed work through competitive bidding. By this SPR and the ESMP the proponent, the community project management committee (PMC) and the supervising engineer will check and verify every step of the work by the Contractor to ascertain that quality and safety standards are met and that the work output does not compromise the set achievements of the project. The proponent will ensure that regular site meetings by all the relevant stakeholders are held to oversight the work.

The bid document has made provision for testing of material and equipment to ensure quality at Contractors cost.

3.4.8 Climate Change Act, 2016

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

The development and implementation of the project will contribute towards the stated objectives of the climate change act and enhance the resilience of the Alego Usonga ward community particularly through the availability of curing and product storage facilities. The project contributes to Kenya 's NDC through proposed solarization of the stores and the entire rice milling plant.

3.4.9 Malaria Prevention Act (CAP 246)

An ACT of Parliament to repeal and re-enact the Malaria Prevention Act, to establish the National Malaria Prevention and Control Institute, to provide for the prevention and control of malaria and for connected purposes.

The Proponent has adequately provided measures for the prevention and control of malaria sensitization of the community on use of nets, indoor residual spraying, draining of stagnant water etc. The construction of a soak pit is provided for in the design to ensure waste water is managed.

3.4.10 The Energy Act, 2019

The Energy Act, 2019 was enacted in response to calls to consolidate the laws relating to energy; promote renewable energy; promote exploration, recovery and commercial utilization of geothermal energy; regulate midstream and downstream petroleum and coal activities, among others.

The proposed source of power running the curing plant and the product store is solar energy. Supply and installation of solar panels and pump is provided for in the design and bill of quantities. The project promotes use of renewable energy source which is also in line with the object of towards low carbon emission in the country's climate action strategies.

3.4.11 The Community Land Act 2016

Part IV section 37 the Act states community land shall be managed in accordance with the law relating to community land enacted pursuant to Article 63 of the Constitution. The proposed project is sited on a community land.

Through this ESIA the proponent has demonstrated that community rights to access land resources are not interfered with in any way. This ESIA SPR has demonstrated that Siriwo Lwasi community agreed to the construction and has no objection. The 1.94 ha land and was communal land with a title deed (see annex 5 land Title deed).

3.4.12 National legal provisions on Gender, HIV/AIDS and Gender Based Violence 1

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

This Act makes provision about sexual offences, their definition, prevention and the protection of all persons from harm from unlawful sexual acts, and for connected purposes. It makes provision about sexual offences aimed at prevention and the protection of all persons from harm from unlawful sexual acts and for connected purposes.

Through this ESIA SPR as provided in the ESMP the proponent will address and resolve all identified and emergent SEA concerns.

2. 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, counseling, support and care of persons infected or at risk of HIV and AIDS infection. 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. Section 7 makes provision for HIV and AIDS education in the workplace in this case even the informal workplace is included. Section 31 prohibits discrimination in the workplace based on the HIV/AIDS status of a person.

The proponent in this ESIA SPR 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 Contractor will incorporate in bid document and implement HIV awareness initiatives during construction of the Project.

3.4.13 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 ESS 8 on Cultural Heritage (IPs/ SSAHUTLC) will be activated 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 for the chance find procedure in Kenya).

3.5 Environmental and Social Standards

World Bank Environment Social Framework Categorizes projects into three levels of risks as High, Substantial, Medium & Low. The magnitude of investments in NAVCDP are small - medium, temporary, site specific, predictable but reversible. The NAVCDP is aligned to the ESF especially 9 out of the 10 Environmental and Social Standards ESS.

World Bank is committed to enhancing social, environmental and climate resilience through its projects and programmes. The Environment and Social Standards outline how to manage risks and impacts, and integrate priorities into World Bank investments to achieve better development outcomes. The table below shows the applicability of World Bank Standards to the proposed project.

S/No	Standards		Aligned
1	ESS 1	Assessment and Management of Environmental and Social risks and Impact	x
2	ESS 2	Labour and Working Conditions	x
3	ESS 3	Resource Efficiency and Pollution Prevention Management	x
4	ESS 4	Community Health and Safety	x
5	ESS 5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	x
6.	ESS 6	Biodiversity Conservation and Management of Living Natural Resources	x
7.	ESS 7	Indigenous Peoples/ Sub Saharan African Historically Underserved Traditional Local Communities	x
8.	ESS 8	Cultural Heritage (IPs/ SSAHUTLC)	x
9.	ESS 10	Stakeholder Engagement and Information disclosure	x

Table 3-1 Analysis of potential triggers to ESS Standards

No	Statement	Description	Applicability to World Bank ESS
1	ESS1 Assessment and Management of Environmental	Anticipated environmental risks are: those related to community safety (including dam safety and safe use of pesticides). Those related to climate	The ESS is applicable during construction of the curing and product

	and Social risks and Impact	change and other transboundary or global risks and impacts. Any material threat to the protection, conservation, maintenance and restoration of natural habitats and biodiversity. Those related to ecosystem services and the use of living natural resources, such as fisheries and fore Anticipated Social risks: Threats to human security through the escalation of personal, communal or inter-state conflict, crime or violence 2. Risks that project impacts fall disproportionately on individuals and groups who, because of their particular circumstances, may be disadvantaged or vulnerable 3. Any prejudice or discrimination toward individuals or groups in providing access to development resources and project benefits, particularly in the case of those who may be disadvantaged or vulnerable 4. Negative economic and social impacts relating to the involuntary taking of land or restrictions on land use 5. Risks or impacts associated with land and natural resource tenure and use impacts on the health, safety and well-being of workers and project-affected communities 6. Risks of cultural heritage	store there will be excavation for the foundation, The vegetation next to the milling plant will be cleared around will be cleared
2	ESS2: Labor and working condition	Develop and implement written labor management procedures applicable to the project 1. Detailing Renumeration / compensation 2. Nondiscrimination and equal opportunity 3. Workers organizations 4. Child labor and minimum age 5. Forced labor 6. Grievance mechanism 7. Occupation health and safety 8. Management of contracted workers - 9. Community workers –working conditions,	The proponent will follow all the labor requirement conditions as per the as per the Employment Act of Kenya and World Bank ESS 2. The ESS2 is triggered
3	ESS 3 Resource Efficiency and Pollution	Pollution Pevention: Management of Air Pollution: Requires an estimate of gross greenhouse gas	In view of the application of fertilizers used in the field and IPM procedures

	Prevention Management	emissions resulting from project • Management of Hazardous and Non-hazardous Wastes: Requirements on management of wastes, chemical and hazardous materials, and contains provisions to address historical pollution Management of Chemicals and Hazardous Materials: • Management of Pesticides: Requires management of pesticides, preferring integrated pest management (IPM) and integrated vector management (IVM), and where pesticides are necessary, minimizing risks to human health and the environment Applies to facilities or projects that consume energy in: • Process heating and cooling; • Process and auxiliary systems, such as motors, pumps, and fans; • Compressed air systems and heating, ventilation and air conditioning systems (HVAC); • Lighting systems • Examples: leak elimination, insulation, electric motors (electric water pump), lighting fixtures	used to control pests in the curing and product store, The ESS 3 will be triggered
4:	ESS 4 Community Health and Safety	Identify risks and impacts of project and its activities to the community and propose mitigation measures • Establish and implement appropriate quality management systems to anticipate and minimize risks and impacts that such services may have on community health and safety • Identify the investment's potential risks and impacts on ecosystem and appropriately mitigate them • Take measures to avoid or minimize transmission of communicable diseases that may be associated with the influx of temporary or permanent project labor implement measures and actions to control the safety of deliveries of hazardous materials, and of storage, transportation and disposal of hazardous materials and wastes	As per the Occupational Health and Safety requirements there will be risks and impacts during construction operation and decommission phase. Therefore, ESS4 will be triggered

5:	ESS 5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	ESS applies to permanent or temporary physical and economic displacement resulting from • land acquisition or • restrictions on land use imposed in connection with project implementation	The proposed project is being implemented on a public land so the ESS is not triggered
6	ESS 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	Applicability of this ESS is established during the environmental and social assessment / Screening described in ESS1. • All projects that potentially affect biodiversity or habitats, either positively or negatively, directly or indirectly, or that depend upon biodiversity for their success. • Also applies to projects that involve primary production and/or harvesting of living natural resource	The whole project activity is located in swampy wetland area with diverse ecological systems. The biodiversity of the area especially migratory birds will be identified and their sites protected by the proponent
7	ESS 7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	This ESS applies to a distinct social and cultural group identified in accordance with paragraphs 8 and 9 of this ESS. • In Kenya, such groups are referred to as ‘Indigenous Peoples’. • For example; Garissa (Somali, Orma), Wajir (Somali), Mandera (Somali), Marsabit (Burji, Rendille, Gabra, Dasenach, Sakuye, Borana Galla (Oromo), Turkana (Turkana), Others in Kenya; Tana River (Waata/Watha, Sanye, Munyoyaya, Dahalo, Aweer/Boni, Malakote also referred to as Ilwana/Walwana), Lamu (Orma,	The project is being undertaken in a place where there are no indigenous people as per the world bank classification however there are vulnerable marginalized Persons and the proponent will have to take special interest on persons classified as VMG
8	ESS8 Cultural Heritage	Cultural heritage - encompasses tangible and intangible heritage, which may be recognized and valued at a local, regional, national or global level, as follows: Tangible cultural heritage - movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Tangible cultural heritage may be located in urban or rural settings, and may be above or below land or under the water; Intangible cultural heritage - practices, representations, expressions, knowledge, skills—as well as the	There are no cultural heritage sites however, in case of chance finds, then the contractor will stop any proceeding activities and consult with the proponent and the national museums of Kenya. The ESS is not triggered

		instruments, objects, artifacts and cultural space	
9	ESS 10. Stakeholder engagement and Information Disclosure	ESS10 applies to all projects supported through Investment Project Financing. 2. The project will engage with stakeholders as an integral part of the project's environmental and social assessment and project design and implementation, as outlined in ESS1. 3. Provide stakeholders with timely, relevant, understandable and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination and intimidation	The project entails consent from the public. This is as per the constitution of Kenya article 10 and article 232 There will be serious consultation along all the project phases planning, construction, operation and decommissioning. This is for Environmental and Social aspects both positive and negative impacts ESS 10 cuts across all the other ESS and it is triggered is triggered

3.6 International Conventions and Treaties

Kenya has stratified or accented to numerous international treaties and conventions. Those that have implications on the project are described below:

3.6.1 Conservation of Biological Diversity (CBD) Regulations 2006

These regulations are described in LegalNoticeNo.160 of the Kenya Gazette Supplement No.84 of December2006.These 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. The project does not pose any threat to any plant or animal life in the project context. The project provides opportunity for vegetation in the area

3.6.2 Sustainable Development Goals

Through the implementation of the curing and project store project by the proponent the following SDGs will be achieved in the community. Goal 1: Eradication of extreme poverty Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture. Goal 6: Ensure availability and sustainable management of water and sanitation for all. Goal 5:protect,restore,promote sustainable use of terrestrial ecosystems, manage forests, and halt and reverse land degradation and halt biodiversity loss. Goal 13 Climate action.

4 CHARACTERISTICS OF THE PROJECT AREA

4.1 Background information

The proposed investment is located in Usonga Ward, Alego Usonga Sub-County, Siaya County, bordering Bunyala Sub-County in Busia County, a major rice-growing region. The project will be implemented by Usonga Rice Cooperative Society, which is actively involved in paddy rice production, aggregation, processing, and marketing of milled rice.

Formed to focus on rice production, processing, and marketing, Usonga rice cooperative society aims to improve the economic and social welfare of its members and the wider community.

The society was started in 2010 first as a Community-Based Organization (CBO). The CBO was necessary to help farmers mobilize resources and advocate for equitable resource distribution and engage with local and relevant stakeholders. Later in 2022, the CBO transitioned into a Cooperative Society reflecting growth and a more structured approach to achieving its goals.

Currently, the cooperative cultivates 1,200 acres, producing approximately 4,000 metric tonnes of rice annually. However, production is expected to expand to 2,000 acres once the World Bank-funded Lower Nzoia Irrigation Project (LNIP) is fully operational. Recognizing the potential of the rice sector, the County Government has supported the cooperative by installing a 2.5 MT/hour rice milling plant, enabling farmers to process their own paddy rice and benefit from by-products such as brown rice, bran, husks, and broken rice.

Despite these advancements, critical gaps remain in farm mechanization, aggregation facilities, and clean water provision, which are essential for maximizing efficiency and productivity. This investment aims to address these challenges and further enhance rice production and processing capacity in the region

4.2 Overview of Rice value chain

Rice is the third most important cereal in the country after maize and wheat, with a 12% annual increase in demand rate. The annual average national rice consumption is estimated at 949,000 MT compared to an average production of 180,000 MT per year. In 2022, the country produced 125,000 MT of rice that was only able to meet 16% of the local demand, necessitating importation of the commodity. With a projected population growth rate of 2.7% per year, the estimated annual national demand for milled rice is expected to reach 1,290,000 MT by 2030. The country can bridge this gap as 26% (1.5 million ha) of the arable land in Kenya is suitable for rice production. Out of this, 0.5 million hectares is suitable for irrigated rice production while 1.0 million hectares can support rain-fed production.

About 80% of the rice produced is from irrigated schemes under small-scale farming, managed by the government through the National Irrigation Authority (NIA) or community organizations. Nearly 70% of the total production of rice is from the Mwea Irrigation Scheme in Kirinyaga County. Other rice growing counties are in Kisumu, Busia, Tana River, Kwale, Migori, Homa Bay, Siaya and Taita Taveta counties

In Siaya, rice is mainly produced under irrigation schemes managed by government or community-managed schemes. These schemes are found in Bunyala (Usonga) and Anyiko (community irrigation scheme). The irrigated areas are under small-scale farming, with nearly 95% being produced by Bunyala Usonga Irrigation Scheme.

In the government-managed irrigation scheme of Bunyala irrigation scheme, farm operations such as land preparation and harvesting are more than 90% mechanized. The mechanization services

are offered by private investors who normally charge high costs of farm operations. Post harvest practices such as drying and storage are done at individual level making it difficult for rice cooperatives to aggregate and market rice from farmers. Although there exist two small stores in the area, their capacity and facilities available are still way below the current and anticipated rice volumes produced by the farmers.

In the proposed project site, there exist large-scale integrated rice mill with an average capacity of 2.5 tonnes/hour and is expected to help achieve the project objective of increasing market participation and value addition for rice.

4.3 Project location

The proposed site for the construction of rice curing store and product store is in Siriwo Uasi Village, Usonga Ward Alego Usonga Sub County. The area lies in GPS Coordinates Latitude S 0.084594, Longitude E 34.082015. The project is community led and targets to transform the rural livelihoods of the rice farmers. It is situated on land under Siaya County Council Title No Usonga/SUMRA/1294 1.94ha (Annex 5). The land was originally designated for construction of a cattle dip by the county government, however a request for change of use have been written to the county national land commission office and was accepted. The land is in a swampy area where there have been cultivation of irrigated rice. The proposed site is about 3 km away from the Siaya-Nyadorera tarmac road.

The nearest hospital is Uasi dispensary which is 1 km away. The Usonga Sub county hospital is east of the project site about 4 to 5 Km away. The nearest primary school is Uasi primary school and is 100 meters from the project site. The office of the chief is about 1Km away from the proposed site.

The project will also benefit the following villages: Uwasi village A to D, Ulupi village A&B, Mulamba village A&B, Ndagaiwa village A to D, Buhoba village A to F, Udamayi village. A geographical satellite image of the project location showing proposed site of the curing and product store is presented in figure 3-2 below.

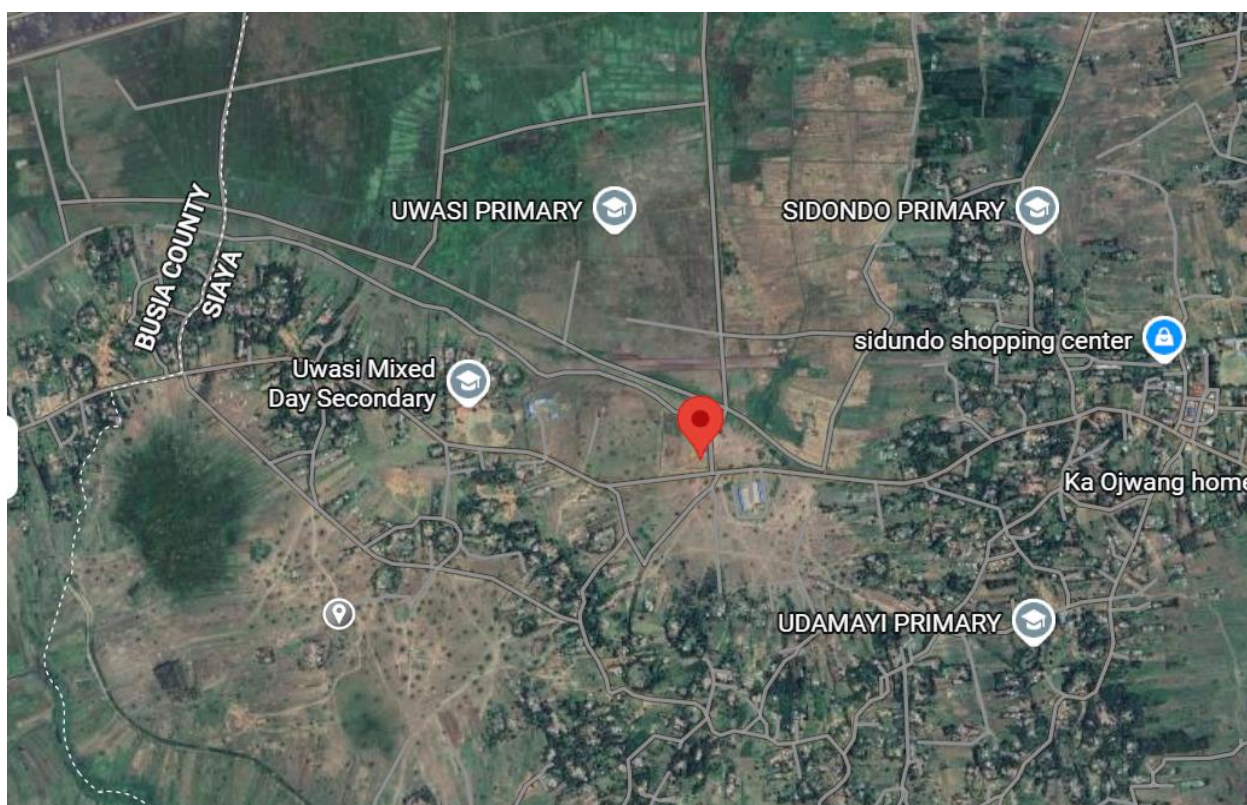


Figure 4-1: Location of the project site (Source Google Earth)

4.3.1 Proof of Land Ownership

The proposed site of the curing store and product store will be on public land under the county government of Siaya. The parcel number 1294/Usonga/Sumba (Annex 5). The registration corticated in *Annex 10* and KRA pin certificate in annex 17. The surrounding farms are privately owned and the owners are members of the Usonga Rice Producers Cooperative Society Ltd and are actively engaged in the production, aggregation, processing, and marketing of rice.

4.4 Demographic and population profile

4.4.1 Population

The Usonga population as per the 2019 census is around 16,000 with an average household size of 5

Table 4-1: Population characteristics Alego Usonga sub county ward

Wards	Total	Household Size	Land Area	Density per Sq. km
Usonga	16,965	5	79.2	214
West Alego	40,206	5	98.9	407
Siaya Township	40,299	5	42.6	944
North Alego	27,079	7	53.8	503
South East Alego	70,415	7	191.5	368
Central Alego	38,658	5	139.8	227

Source: KNBS, 2019

4.5 Physical Environment

4.5.1 Topography

Flat to Slightly Sloping Terrain: The land is primarily flat but includes areas with a slight slope, requiring levelling for optimal rice farming.

Poor Drainage: The flat nature of the land with high clay content encourages water-logging, ideal for rice production.

Uneven Surface: Areas not well-levelled, require significant investment in levelling and land preparation for efficient rice farming.

Implications for Rice Production: Land topography is generally suitable for rice farming. However, there are challenges in water management, leading to inefficient irrigation water use and increased costs in management.

4.5.2 Soils

To determine the soil texture, a transect walk was undertaken in and around the proposed facility. It was noted that the soil texture is uniform in the said area and the soil profile was indicative of moderately calcareous soils. To determine the soil texture further below depth texture, a trial pit was dug to a depth of 1.2m deep. The soils are well drained moderately deep to deep, dark brownish

The soils are suitable for quite a wide range of horticultural crops and mainly vegetables such as tomatoes, kales, onions, chilies, water melons. It is also suitable for rice (with proper water management), sorghum, maize, and legumes and cotton.

4.5.3 Ecological and Climatic conditions

Ecological conditions

The County spreads across agro-ecological zones LM1 to LM 5. According to the Kenya Soil Survey and Integrated Regional Development plan for the Lake Basin Development Authority, The northern part of the County comprising Gem, Ugunja and Ugenya Sub-counties and the upper parts of Alego Usonga Sub-County (Usonga ward) are classified as the low-midland zones (LM2 and LM3). These are sub-humid and humid zones with reliable precipitation.

Climatic conditions

The proposed project site is in Agro climatic Zone 3 and is within an altitude of about 1200m above sea level. Rainfall is bimodal; with long rains expected in the months of April to May while the short rains are received in the months of October to November. Rainfall expected per year ranges between 800mm and 1400mm. Temperatures are high all year round ranging from 22° and 24°. The zone is mainly used for agriculture and livestock rearing.

Climate Change issues

Siaya County is characterized by high poverty levels (47.56%) and food insecurity. Agriculture is the main source of livelihood in the County, contributing about 60% of the household income and providing almost 61% of all employment opportunities. Droughts and intense rainfall already constrain agricultural productivity and food security in Siaya County; climate projections indicate increasing events of drought and intense rains.

4.6 Socio economic characteristics of the area

4.6.1 Land and Land use/Zonation

The Project area can be categorized as semi-humid, ranging between Lower Midland zones (LM2 and LM3). The climate can support suitable crop varieties such as maize, beans, sorghum and cassava and sweet potatoes (Table 3-1), with butternut and other horticultural crops such as tomatoes having great potential under irrigation. *Leucaena*, *Sesbania sesban* as agroforestry species have the potential in soil fertility management and resilience building for livestock farmers.

Table 4-2 Agro -Ecological Zonation Of Siaya County

Zone	Division /Subcounty	Suitable crops
LM1	Gem, Yala	Sugarcane, Maize, beans, finger millet, coffee, sweet potatoes and horticulture
LM2	Alego Usonga	Maize, beans, tobacco, finger millet, coffee, sweet potatoes and irrigated rice
LM3	Sakwa and Asembo	Maize, beans, finger millet, sorghum, cotton
LM4	Uyoma in Rarieda Sub-County and Yimbo in Bondo Sub-County	Sunflower, sorghum, cassava
LM5	Uyoma in Rarieda Sub-County and Yimbo in Bondo Sub-County	Sorghum, Millet

Source: Jaetzold et al. 2007

4.6.2 Land use and economic activities

Crop farming and livestock production

The major economic activity in Usonga Ward is crop production. Most of the people are small holder mixed farmers mainly cultivating food crops grown are rice, maize, sugar cane, and horticultural crops including vegetables, fruits. The main livestock kept in the ward is the indigenous zebu, goats, sheep, dairy goats, meat goats, indigenous and improved indigenous poultry. The average farm size households is 1 to 3 acres. Rice as a cash crop is majorly grown in the lower Nzoia region where floods are also sometimes experienced

Flora and Fauna

The area is largely swampy most common trees are indigenous species. Generally, there are few trees around and there is need to sensitize the community to plant more indigenous and exotic trees. The most common fauna found in the project area include birds, insects, rodent and snakes Others are majorly domestic animals consisting of cattle, goat, sheep and poultry

4.6.3 Ecologically sensitive areas

There are migratory birds that reside within the irrigated farming areas and therefore the proponent would be encouraged to integrate the use of integrated pest management or bio pesticides.

4.6.4 Major Conflicts and resolution

The main issues experienced within the area involve land succession and inheritance, grabbing of public utility spaces and land boundary disputes, tenancy and labour conflicts. Domestic violence

relating to sexual exploitation and abuse and gender-based violence are also common occurrences. The methods used to resolve such conflicts include (among others)

- Extended family members
- Religious institutions/ religious leaders
- Chief/Assistant chief
- Elders
- Courts
- GBV referral pathways eg hospitals, police centres

4.7 Physical infrastructure

4.7.1 Water access and sanitation

Unreliable water for domestic use is experienced by the community around the proposed site. Water for domestic use is normally from boreholes and shallow wells which get depleted during dry periods. The average distance to a water point in the project area is 200 meters. About 80 % of the residents have pit latrines but there is no sewerage system in the area posing risks of surface water contamination with faecal material.

Water for agricultural production especially irrigated rice is sourced from River Nzoia and managed by National Irrigation Authority.

4.7.2 Roads

There exists an earth access road which is about 3km from the main Siaya Nyadorera tarmac road that can be used to access the site.

Most roads in the ward are all-weather, and rural access roads are accessible during dry seasons, but some roads are somewhat problematic, especially during the rainy seasons. Telephone

4.7.3 4.6.3 Telephone connectivity

The telephone network connectivity in the project area is generally good. The main mobile network providers available are Safaricom, Airtel, and Telkom. Telephony complimentary services including mobile money transfer are also easily available at the market centres.

4.6.4 Electricity Coverage and use of Solar

The area is well covered with electric power lines and there is a transformer right at the proposed project site where there is newly established rice milling plant. Most households rely on solar energy for lighting while small businesses use electric power.

4.7.5 Marketing Centres

There are four major market centres in the ward -Nyadorera, Uasi, Sidundo and Siamungu.

The nearest and the biggest market to the project site is Nyadorera market and support exchanges of agricultural produce such as cereals and agricultural inputs such as fertilizers, pesticides among other goods and services

4.7.6 Housing

The major housing type in the area is mud walled iron roofed houses, however stone walled houses are coming up. Table 3-4 provides a comparison of housing type in the area with the county

aggregated statistics. As housing type reflect wealth status, the Project area could be said to be relatively rich compared to other areas of the county.

Table 4-3: Housing type in the Project Area

Housing type	% of Households in the Project site	County indicators
Earth floor	83	90
Cement Floor	17	12
Mud walled	85	82
Corrugated Iron Roof	78	61
Grass thatched	22	25
Brick /Stone wall	15	5%

Source: CIDP 2022-2027

4.7.7 Health and Environment

Residence of the area primary access health services from Sumba dispensary which is 1.5 km to the south of the site and Rumbwa Sub County hospital which is 4 km to the East of the proposed site.

5 PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS.

5.1 Public Participation

A public participation and stakeholders consultations were undertaken in line with the Constitution of Kenya 2010, Environment Management and Co-ordination Act 1999, and the County Government Act, 2012 as well as the World Bank guidelines ESS 10. Plate provides evidence of the ESIA process compliance with the provision.

Consultation and public participation was conducted (see invitation letter in *Annex 15*) with an aim of gathering environmental and social data understanding likely impacts determining community and individual preferences, selecting project alternatives and designing viable and sustainable mitigation and compensation plans if any

The exercise took place on 31st March 2025 at Uasi Village Alego Usonga Ward. It was attended by 40 participants disaggregated (Males 25, Females 15.) (Annex 3) It was very interactive, participatory and intensive session between community, Government officers, NAVCDP County staff and the ESIA Consultant about 27 questionnaires were randomly administered to the participants.

5.2 Purpose for the public and stakeholder consultation

The key objectives of the consultation and public participation for proposed construction of the curing store and product store was to:

- ✓ Disseminate and inform the project stakeholders about the proposed project, its key components and activities, location and expected impacts with particular attention to potentially affected persons
- ✓ Create awareness among the public and stakeholders on the need for ESIA for the proposed construction of the curing and product store and its process
- ✓ Create a sense of ownership, capacity build and ensure transparency in all activities to related to the project including but not limited to designing, planning, implementing, environmental management, operation, monitoring evaluation of the project by all key stakeholders
- ✓ To seek and examine views on health, safety, social and environmental issues from the potentially affected community;
- ✓ To lay the foundation for future negotiations on any issues that may arise so as to build consensus and reach a mutually acceptable resolution of issues.
- ✓ Provide the establishment's neighbours/community with a forum to air any issues or concerns they may have with the establishment's operations on Health Safety, social and Environment (HSSE)

5.3 Public Consultation process

5.3.1 Stakeholder mapping

The environmental and social assessment public participation exercise was conducted in March 2025 by the expert using 3 approaches (i) Focused group discussions and Key informant interviews , (ii) Field surveys and observational checklists and (iii) Public meetings. In general, the following steps were followed in carrying out the entire process: -

- ✓ Identification of institutions and individuals interested in the process and compiling a database of the interested and affected parties

- ✓ Administration of questionnaires to different target groups and local community members in the administrative area for the proposed project site (Annex I)
- ✓ Public / Technical Meetings at various levels and with different target groups

Below is a team of the ESIA lead experts undertaking community sensitization meetings



Chairman Usonga Siriwo Rice addressing participants



Conflix Oyuga member of the Siriwo Rice Cooperative addressing her concerns

Plate 5-1 Community sensitization meetings

5.3.2 Public consultation questionnaires

Consultative experts' meetings were continuously held during the field exercise to consolidate the issues affecting the project as well as capturing issues raised by the project affected persons. Twenty questionnaire checklists given out to the stakeholders for filling and analysis was done.

5.3.3 Public consultation meetings

Two comprehensive public meeting as well as technical meetings were held on the dates of 31st March 2025 and 5th April, 2025 with the local residents, Chief Mr Paul Kanoti, Assistant chiefs Village elders, area ward administrator and other local administrative leaders in attendance in the project area. (Minutes of meeting and list of participants Annex 2 and 3 respectively). The Issues arising in the meeting are captured in as reported in the following sections. The meeting was used to publicize the proposed construction of curing and product store project and the anticipated effects and benefits. During the public participation meeting, stakeholders had a chance to interact with the proponent represented by the ESIA expert, Associate expert and county technical staff in charge of Livestock and agriculture, Social services officials at county level. The findings are



incorporated into this report and captures the issues, suggestions, concerns and recommendations from public meetings on site. The meetings were well attended and the attendees participated actively during the meetings (Plate 6-2).

Plate 5-2: Site visit at the proposed construction site for the stores



Bernard Ayaga Associate expert taking participants through ESIA process



Participant filling the questionnaire and raising concerns

Plate 5-3: Participants filling individual questionnaire



Participants raising their hands in acceptance of the construction of the rice curing and product store



Chief of Uasi location Mr Kanoti addressing the participants

Plate 5-4: Participants at Uasi village raising hands in acceptance of the proposed project

5.4 Issue raised during the Consultation

The Appendices present the information on the public consultations undertaken under the environmental impact assessment for the proposed curing and product store project. This information includes selected responses as detailed in the minutes (Appendix ii). It was noted that members lauded the project and were eager to see the start of the project. However, there were a few areas that the members sought clarity. A summary of the key concerns raised by the participants is provided in table 6-1 below:

Table 5-1: Stakeholder Consultative meeting key concerns raised

SN.	Issues raised by the members	Concerns	Response
-----	------------------------------	----------	----------

1.	Employment opportunities	project will create employment opportunities during the project cycle from construction to operation	The community agreed and promised to provide both skilled and skilled labour
2.	Installation of solar panels	Question was raised that what will happen if the solar panels fail to generate power	Some members of the community will be trained on operation and maintenance
3.	Excavation	Once the excavation is done where will the soil be deposited? Wont there be a lot of soil debris in the compound	The excavated soil will bespread for landscaping
4.	Contingency funds	Is there any funds for contingency or in case of emergency	Yes in any BQ or budget there is 5 to 10 % c
5.	Erosion	Stakeholders residing around irrigation canals and catchment sites will be will be affected by erosion	Encourage communities to plant trees and construct terraces
6.	Possibility of floods	There will be an appropriate drainage system as per the designs	The National Irrigation Authority have constructed dykes and canals to control flood water in the lower Nzoia irrigation scheme
7.	Mosquitoes/Malaria incidences	Wont there be increased incidences of malaria due to stagnant water in the irrigation canals and in the puddies the rice fields	The surrounding community members will be provided with mosquito nets and sensitized on malaria control measures
8.	Maintenance and sustainability of the curing store and product store	Who will maintain the stores once the project is complete	The project management committee will be trained on sustainability of the stores and a business plan will be put in place
9.	Food security and nutrition security especially human and livestock feed	That the curing store and product store will be in place it therefore means that rice from the fields. How will the processed rice be marketed	There will be marketing stalls installed in the project site so that retailers and wholesalers can purchase the rice
10.	Improved Economic status	Income at household level will be enhanced, communities will be able to sell their rice	The community members will be linked to potential markets through various service providers in order to fetch out better prices

11.	Enhanced livelihood resilience and alternatives	Since there will be irrigation throughout the year. It will be possible to produce food crops and animal feed products throughout the year	Idleness in the community will be reduced and community members will be engaged in productive labour
12.	Catchment protection	The stakeholders will be encouraged to establish tree nurseries and agro-forestry in their farms along the catchment areas	Communities around the catchment areas to be sensitized and encouraged to grow trees for commercial purposes
13.	Accidents during construction	During construction and operation phases accidents are likely to occur	The proponent will strictly adhere to safe working practices to protect the workers, neighbors and passers-by
14.	Accidents during operation phase	During construction and operation phases accidents are likely to occur in the milling plant or in the stores	The proponent will strictly adhere to safe working practices to protect the workers, neighbors and passers-by

5.5 Opinion on Project implementation

It is clear from the filled questionnaires received that the project will serve an important role of providing the community with a curing store for raw rice and product store for keeping rice after milling. All the residents admitted that they were interested in this project more solely for the reduced post harvest losses, improved food security and livelihoods in so doing pointed to the benefit that will accrue to them.

5.6 Suggestions and comments from public consultations

- The Usonga Rice Producers Cooperative Society management team must take full responsibility in sustainability and maintenance of the curing and product stores
- Farmer views should be incorporated in the programme. They suggested to have a dedicated committee to be airing farmers concerns.
- Ensure the workers/employees of the proposed project are insured through WIBA for adequate compensation due to injury while at work.
- Jobs opportunities that will arise during the construction of the rice curing and product store and operation phase should be reserved for the residents of the project areas.
- Construction work should strictly observe standards of Occupational Health and Safety including use of appropriate PPE. During operation, need for appropriate PPE such as gloves, gumboots to prevent occupational diseases, injuries and accidents should be emphasized.
- The contractor should have a holding/launching yard for materials and equipment to control environmental pollution.
- The contractor should also strive to use high quality construction materials as detailed in the design
- Educating on HIV aids control
- Proper waste disposal site should be demarcated and fenced off from birds

5.7 *Grievance Redress Mechanism (GRM)*

To ensure transparency, accountability, and timely resolution of concerns arising during the implementation of the Environmental and Social Impact Assessment (ESIA) for Construction Works for Siriwo Enhanced Rice Processing and Marketing at Usonga Ward in Siaya County, a structured Grievance Redress Mechanism (GRM) will be established at project, ward, and county levels. The GRM will provide accessible, inclusive, and responsive channels for addressing complaints related to construction activities, labour and working conditions, environmental impacts, community health and safety, land-related concerns, and operational issues associated with the rice processing and marketing facility.

At the project level, a five-member Grievance Redress Committee (GRC) will be constituted. The committee will comprise representatives of the Facility Management Committee, women, youth, vulnerable and marginalized groups, a community representative, and a technical or project liaison officer. The GRC will receive grievances either verbally or in writing and record all complaints in a standardized Grievance Register. Each complaint will be assigned a unique reference number and acknowledged within forty-eight (48) hours of receipt. The committee will investigate and seek to resolve grievances within seven (7) to fourteen (14) days, depending on the complexity of the issue. A designated Project Social Safeguards Focal Person will be responsible for documenting, tracking, updating, and reporting the status of grievances, including indicating whether cases have been resolved at the project level or require escalation.

Where a grievance cannot be resolved at the project level, it will be escalated to ward-level structures, including the local administration and relevant sector departments for further review and mediation. If the matter remains unresolved, it will be forwarded to the County Social Safeguards and Grievance Management Officer (CSS&GMO), who will present it before the County Grievance Management Committee (CGMC) for review and final determination. All escalated grievances will be recorded, monitored, and tracked to ensure timely resolution and proper closure.

In addition to physical reporting channels, complainants may submit grievances through digital platforms, including a web-based grievance dashboard, toll-free SMS services, a WhatsApp reporting line, and the official project email address. These platforms will enhance accessibility, confidentiality, and efficiency in grievance handling. All electronically submitted cases will be automatically logged into the grievance tracking system and monitored through to resolution.

To enhance awareness and accessibility of the GRM, the project will conduct regular stakeholder sensitization forums to explain grievance procedures, publicize reporting channels, clarify response timelines, and promote transparency and trust. Relevant information will be displayed on public notice boards at the construction site and the rice processing facility, and shared during community meetings within Usonga Ward to ensure inclusivity and equal access to grievance resolution processes.

A discrete and confidential Grievance Redress Mechanism channel will be established to specifically handle Gender-Based Violence (GBV) and Sexual Exploitation, Abuse, and Harassment (SEAH) related complaints. This specialized GRM pathway will operate independently from the general grievance system to ensure privacy, survivor-centered response, and protection from retaliation. A trained GBV/SEAH Focal Person will be appointed to exclusively manage such grievances, ensuring that all cases are handled with strict confidentiality, sensitivity, and in accordance with established ethical standards and referral protocols. The focal

person will coordinate with relevant service providers, including health, psychosocial, legal, and protection services, to facilitate timely support and redress for survivors while upholding the principles of safety, dignity, non-discrimination, and informed consent.

Table 5-2: Communication & Stakeholder Engagement Plan

Environmental / Social Aspect	Potential Impact / Risk	Mitigation / Enhancement Measure (Communication Actions)	Frequency
Stakeholder awareness	Limited understanding of project scope and benefits	Conduct community Barazas to explain project objectives, scope, benefits, and responsibilities	Once / As needed
Stakeholder participation	Exclusion of some groups (women, youth, PWDs)	Hold inclusive consultations; ensure representation of women, youth, and vulnerable groups	During planning
Information disclosure	Misinformation and rumors	Display project information on notice boards; share updates via SMS/WhatsApp	Continuous
Community safety & disruption	Complaints due to construction noise, access restrictions	Regular communication on construction schedules and safety measures	Weekly
Labor and community relations	Conflict between workers and community	Sensitize workers and community on code of conduct and grievance channels	Monthly
Grievance management	Unresolved complaints escalating into conflicts	Implement Grievance Redress Mechanism (GRM); maintain grievance logbook	Continuous
Water allocation & use	Conflicts over water distribution	Communicate irrigation schedules and water abstraction rules via notice boards and SMS	Weekly
Financial transparency	Distrust over user fees and expenditures	Share financial reports during AGMs and general meetings	Bi-annually
Environmental protection	Poor compliance with water conservation measures	Awareness campaigns on water conservation and pollution control	Quarterly
Gender & social inclusion	Marginalization of vulnerable groups	Targeted communication and engagement sessions	Continuous
Feedback & continuous improvement	Lack of feedback from users	Collect feedback during meetings and through suggestion boxes	Quarterly
Information disclosure	Confusion on closure or transition	Inform members and stakeholders early on decommissioning plans	

6.1 Introduction

This section examines feasible alternatives to the proposed curing and product store. The benefits of the proposed project have been considered against any potential environmental cost. The general principle involved in identifying alternative option(s) to a proposed development was to ensure that the option chosen would result in optimal social, environmental, and capital benefits not only for the proponent but also for the general environment in the area. This section has explored five alternatives namely, no-action alternative, relocation alternative, water source alternative, source of power alternative, and the project alternative

6.2 “No Project alternative

The selection of the “No-action” alternative would mean the discontinuation of the proposed project. Thus, the site is retained in its existing form. If this alternative is selected, the site is unlikely to undergo changes from its present condition. This choice is not feasible because lack of product and curing store will result into major postharvest losses while also causing the society members to miss on the opportunities associated with the stores. Moreover, the milling plant will not perform satisfactorily without the proposed project.

6.3 Alternative Site

This option would mean the transfer of the proposed development to another site. The wide range of assessment of soil analysis, combined with topographical surveys and catchment area assessments, flood control and construction of dykes and canals would be exercise in futile. The proposed development will not contribute to any adverse or irreversible damage to the social, economic, physical or hydrological environment. The Usonga Rice Producers Cooperative Society members have no curing or product store in the area and urgently in need of a reliable store for curing and product store for storing the milled rice. The proposed site is also within the proximity to the rice farms and the mill. Relocation alternative will mean that high transportation cost will be incurred while transporting the paddy to the mill and the milled rice to the product store. Additionally, a lot of post-harvest losses will be incurred if the project is relocated. Relocation is therefore not a possibility under the circumstances.

6.4 Alternative design and technology (Include wastes disposals)

Several types of curing and product store have been identified such as prefabricated containers that can be modified as curing and product store. However, the containers would require modifications that may not meet appropriate design of the stores. The current production is approximately 4,000MT. This means that we require at least 10 containers of several sizes which are not also designed to be stores

6.5 Alternative power source

This option involves considering the alternative solarisation of the curing store and product store where about 400 solar panels will be installed in case of power failure from the national grid. A stand by generator can be in place to run the rice storage facilities.

6.6 The project alternative

This means implementation of the proposed project as is. The community through public participation has identified the proposed project site as ideal and this was corroborated through feasibility study report. Baseline information also shows that the area is void of any physical, biological, cultural, and socio-economic features of concern. The project location at Siriwo Uasi village is found appropriate.

7 ANALYSIS OF POTENTIAL IMPACTS AND MITIGATION MEASURES

7.1 Introduction

This chapter presents the assessment of the issues likely to arise as result of implementation of the proposed project. The impacts are presented in-regard to their likelihood of occurrence on the physical, biological, occupational and socio-economic environments.

Table 7-1: Summary of expected impacts, rating and development stage

Summary of expected impacts, rating and development stage

Impact	Impact rating	Phase
Soil erosion impacts	Low (negative)	Construction phase
Public health and safety	Low (negative)	Construction and operation
Impacts on air quality	Low (negative)	construction
Waste generation	Low (negative)	Construction and operation
Contamination of raw produce	Low (negative)	Operation
Biodiversity conservation	Low (negative)	Construction and operation
Drainage of flood water at the site	Low (negative)	Construction and operation
Socio-economic impacts	Low (negative)	Operation
Visual impacts	Low (negative)	construction

7.2 Positive Environmental and Social Impacts during construction phase

The anticipated positive impacts include the following: biodiversity conservation, availability of reliable and good quality rice, improved household incomes, employment creation, enhance market economy, increased revenue generation the county

7.2.1 Positive environmental impacts

7.2.1.1 Erosion Control

Construction of water harvesting structures i,e roof water harvesting, Construction of drainage channels, water ways

7.2.1.2 Biodiversity conservation and enhancement

Landscaping and planting of trees and flowers in the curing and product store environments. This will enhance the aesthetics, beauty of the place. Community tree planting will enhance biodiversity of the area. A coopretative members' nursery will provide seedlings to the community for environmental conservation

7.2.2 Positive social impacts

7.2.2.1 Informal business Growth

During construction the informal sector will benefit from the operations. This will involve informal traders who will sell their products to be used on site. Such a move shall promote local informal entrepreneurs in the local project area

7.2.2.2 Employment opportunity

Both direct and indirect forms of employment shall arise from the project initiation. Direct employment will be mainly through skilled and unskilled labourers whose workforce shall be needed in the construction. Several workers including casual labourers, masons and carpenters are expected to work on the site from onset of the project to the end. Indirect employment will be experienced through buying construction materials and sale of food to the construction workers by the neighbouring communities.

7.2.2.3 Economic gains

The local economy shall gain much from the project in that materials for building shall be sourced locally within the county and that all the materials are charged VAT, hence increasing revenue collection in the country

7.2.2.4 Provision of Market for Supply of Building Materials

The project will require supply of construction materials most of which will be sourced locally within the vicinity and environs. This provides ready market for construction material suppliers such as quarrying companies, hardware shops and individuals with such materials.

7.2.2.5 Creation of employment opportunities for residents of the project area

The proposed project will provide short term and long-term employment opportunities to the local community. The construction phase will provide short-term opportunities for casual work and semi-skilled labour. During the operational phase, long-term employment opportunities will also be created which will generate income and improve their livelihoods

7.2.2.6 Increased revenue generation by the County and National Government

The project will contribute to the county and national government kitty. The contractor will pay Value Added Tax (V.A.T) on purchasing materials for the project. Construction workers will also pay income tax from their earnings while working on the project. Negative Environmental and Social Impacts during the Construction Phase and Mitigation Measures

7.2.3 Negative environmental impacts during construction phase

7.2.3.1 Loss of Vegetation cover

During the construction phase of the project, bush and tree clearing will be undertaken in the areas to be inundated to minimize the impacts of water pollution from decaying vegetative matter that would die after inundation. Actual construction activities will lead to further loss of vegetative cover at the site of the construction camp for the workers who are likely to be engaged in the actual construction activities. This impact is however not expected to be significant. While no endangered or threatened species were identified in the area, clearing and subsequent inundation constitutes a loss of biodiversity on flora. The vegetation is also home to many invertebrate and avifauna, who will be rendered dispossessed of their habitats

Mitigation:

- ✓ Where possible the contractor to exercise selective removal of existing indigenous tree species
- ✓ The contractor to plant grass and indigenous trees around the pan area as per the ESMP recommendations
- ✓ excavations of the site will be confined only within the sections upon which construction is taking place
- ✓ Excavated earth will be held away from drainage channels
- ✓ The PCU will develop catchment conservation plans to address soil erosion concerns in the catchment

7.2.3.2 Surface ground water pollution/contamination

Earth movement, disposal of vegetation and other cleared materials and the inadequate disposal of liquid and solid waste, including the human waste from the workers, are likely to cause physical and chemical alteration of surface and ground water quality. Civil works, excavations, or an inadequate planning of cuts and fills, may affect the water table significantly.

Mitigation measures

- ✓ The contractor to construct a standard temporary pit latrine for the workers
- ✓ Contractor to identify an appropriate site pit for disposal of vegetation and biodegradable plant material
- ✓ A temporary incinerator to be constructed to burn non bio degradable solid wastes such as plastics
- ✓ Civil works, excavations, cuts and fills to be compacted so that there is minimal soil loss

7.2.3.3 Oil spills/Fuels and Lubricants

The storage or spillage of petroleum hydrocarbons on site presents a hazard and the release of hydrocarbons into the environment could result in significant impacts on a variety of receptors. The pathway for pollution is soil or water, and the primary receptors include the sub-soil and groundwater. Other receptors include air (from fuel vapors) and people (through dermal contact, inhalation or ingestion). It is however worth noting that the risks of a major oil spillages occurring are minimal.

Mitigation Measures:

- ✓ 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
- ✓ Proper maintenance of vehicles and other equipment (using petroleum products) to avoid fuels and lubricants spills at the project site;
- ✓ Safety procedures for fuel storage and re-fueling should be well understood and implemented by site staff; and
- ✓ Oil residuals including waste oil, lubricants, used filters, should be carefully collected and stored for safe disposal, in order to prevent migration of contaminant hydrocarbons into storm water or groundwater resources

7.2.3.4 Air quality degradation due to dust and exhaust emissions

The following emissions will be expected to result from construction activities. This would in turn lead to poor quality of life as well as upper to lower respiratory infections and silicosis condition:

- ✓ Dust from excavations and earth moving vehicles as well as materials delivery;
- ✓ Emissions such as smoke, hydrocarbons and nitrogenous gases among others from machinery exhausts

Mitigation Measures

- ✓ Personal protective equipment (PPE) such as dust masks must be worn in the immediate vicinity of the operations during excavation;
- ✓ The stockpiles of earth generated during construction works should be suppressed by spraying water or water-based mixtures. Spraying should also be carried out on unpaved road accesses regularly;

- ✓ All machinery and equipment should be maintained in good working order to ensure minimum emissions including carbon monoxide, oxides of Nitrogen and Sulphur, as well as suspended particulate matter;
- ✓ Drivers of construction vehicles and delivery trucks should be cautioned to drive slowly near the site to avoid creating dusty conditions.

7.2.3.5 Increased generation of solid wastes

Most of the waste will be generated during the construction waste. This includes papers used in packaging cement and soil this can pose the risk of the site being a breeding for pests, pollution of the physical environment and attraction for scavengers. Temporal storage on site for solid waste such as paper can be done with eventual disposal in compliance with waste regulations. Recycling and reuse strategies can also be achieved.

Mitigation:

- ✓ Use of an integrated solid waste management system i.e., the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle where possible.
- ✓ Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at site;
- ✓ Waste collection bins / receptacles to be provided at the project site
- ✓ Contractor to dump unused excavated materials and debris in designated places
- ✓ Contractor to re- use excavated soil for the pan wall/embankment

7.2.3.6 Noise and Vibration

There will be noise and vibrations generated during the construction phase but it will be no different from that on any other typical construction site. The noise impact during construction is expected to be negative and short-term. Major sources of noises and vibration will come from construction equipments and earthmoving machinery, as well as noise from the work force itself. The major receptors are expected to be the construction workers as well as any immediate neighboring premises.

Mitigations Measures:

- ✓ Conduct noise measuring to determine levels and extent of harmful noise and provide PPE (hearing protection) to persons who must operate within or visit the identified high noise areas;
- ✓ Investigate the possibility of investing in silencers on machines to reduce the quantity of noise produced
- ✓ Inform local residents of any abnormal noise generating construction activities to minimize disruption to local resident

7.2.3.7 Impact on access road

Although it is anticipated that the existing access roads are adequate for the transportation of materials, the contractor must maintain these roads during the construction period.

Mitigation Measures:

- ✓ Vehicles should abide by the speed limits and by-laws of the area;
- ✓ Movement of heavy construction vehicles should be planned appropriately

7.2.3.8 Visual impacts and aesthetics

Excavation and refurbishment works will result in changes in the physical appearance of the project site. Volumes of earth will be excavated and stockpiled while construction materials such as sand and ballast will also be stockpiled at the site. Construction waste may also litter the site and the surrounding area and cause visual intrusion. This will be of a low magnitude and will only occur during construction phase.

Mitigation

- Regular site clean-up to prevent littering
- All excavated material should be compacted to minimize soil erosion
- Restrict project activities to the actual project site
- Establishment of a site store for storage of materials, tools and equipment

7.2.4 Negative Social impacts during construction phase

7.2.4.1 Occupational Health and Safety Hazards

During construction the movement of construction materials may result in accidents if good supervision is not provided. Accidental cuts and bruises are common among construction workers as a result of the use of machinery and hand tools, an impact that needs due consideration.

Mitigation:

- Provide appropriate personal protective equipment (PPE).
- Implement a programme of assessment of routine monitoring of worker health.
- Redesign manual processes and rotate work tasks to reduce heavy lifting/repetitive activities, and where possible install mechanical lifting aids.
- Train workers in general safety procedures including first aid and fire safety.
- Use designated routes for machinery and personnel
- Engineer out sharp edges and access to dangerous parts of machinery through a hierarchy of controls (permanently fixed physical barrier, interlocked physical barrier, physical barrier, presence sensing system).
- Ensure that there are provisions for reporting incidents, accidents and dangerous occurrences

7.2.4.2 Labour Influx Effects

During construction the project will attract jobseekers and hawkers with possibility of thieves intruding into the area. This therefore leads to concentration of people in one area drawn from diverse social and cultural backgrounds often resulting to a number of issues as listed below;

- Strain on various resources especially water resources
- Grievances from local community members over job opportunities
- Sexual Exploitation and Abuse
- Unwanted Pregnancies

Mitigation measures to Labour Influxes

- The contractor awarded the Project will develop a labour Management Plan (LMP) in consultation with local leaders.
- The contractor will ensure effective community engagement and strong grievance mechanisms on matters related to labour, with a discrete mechanism for safely and

confidentially reporting issues of SEA and GBV at the community level triggered by the Project

- Effective contractual obligations for the contractor to adhere to the mitigation of risks against labour influx, the contractor should engage a local community liaison person who is also trained in protection from sexual exploitation and abuse (PSEA)
- The contractor will ensure proper records of labour force on site while avoiding child and forced labour
- The contractor will ensure comply to provisions of Workplace Injuries and Benefits Act (WIBA) 2007
- The contractor will develop and implement a children Protection Strategy; this strategy will ensure that no child under the legal age of 18 years is employed to the Project.
- The contractor should institute a security plan e.g. through a register for all visitors and workers.

7.2.4.3 Increased Spread of STD, HIV & AIDS

There is likely increase in incidences of health impacts such as sexually transmitted diseases including HIV & AIDS especially during construction of the project. Possible illicit behaviours such as prostitution may increase in the centre leading to spread of STD, HIV/AIDS due to influx of workers and perceived ‘quick money’ from the project albeit on a smaller scale.

Mitigation

The following should be implemented to mitigate spread of STD, HIV & AIDS:

- Contractor to develop appropriate awareness content and implement awareness sessions for workers on HIV/AIDS and other STDs. This can be done through the use of educative posters and tool box meetings.
- Ensure an adequate and accessible provision of condoms to workers both male and female.
- Contractors to develop a code of conduct and ensure it's signed by all workers with physical presence on site as well as within the project area.

7.2.4.4 Gender Based Violence(GBV) and Sexual Harassment

This impact is triggered during project construction phase when the contractor fails to comply with the gender inclusivity requirements in hiring of workers and entire project management as per required by Gender Policy 2011 and 2/3 gender rule.

Mitigation

- Ensure clear human resources policy against sexual harassment that is aligned with national law
- Integrate provisions related to sexual harassment in the employee COC
- Ensure appointed human resources personnel to manage reports of sexual harassment according to policy
- The Contractor shall require his employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse
- The contractor will implement provisions that ensure that gender -based violence at the community level is not triggered by the Project, including:

- Effective and on-going community engagement and consultation, particularly with women and girls;
- Review of specific project components that are known to heighten GBV risk at the community level, e.g., compensation schemes; employment schemes for women; etc.

7.2.4.5 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

- Include 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.

7.2.4.6 Child Abuse

Children within project areas will be exposed to risks associated with interaction between them and Project Workers. This includes child labour and sexual abuse which coherently leads to teenage pregnancies and exposure to communicable diseases such as HIV/AIDS.

Mitigation

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

7.3 Environmental and Social Impacts and Mitigation Measures during Operational Phase

7.3.1 Positive environmental impacts during operational phase

It is anticipated that the operations phase of this project will result in:

- Increased availability in quantity and quality of rice
- Rice store will reduce incidences of contamination
- Store will be available for storage
- Reduction in water related conflicts
- Food, nutritional and livelihoods security.
- Improved water availability even during the dry season

7.3.2 Negative environmental impacts during operation phase

7.3.2.1 Loss of biodiversity

Due to increased human activities during operation, biodiversity may be affected. Excavated soils may cover vegetation leading to loss of habitats.

Mitigation measures

- Only critically affected vegetation by the projects should be removed and reestablished later
- Fence off and replant trees and grass around the site.
- Protect sensitive vegetation from soils excavated

7.3.3 Negative social impacts during operational phase

7.3.3.1 Occupational Health and Safety Issues

Health issues are a major concern globally; therefore, hazards associated with diseases must be dealt with. Safety may be compromised when transporting the rice bags. The operation of the facility is likely to result in the following.

- ✓ Increased movement of human leading to congestion on the available paths and walkways which will cause soil erosion in the long run.
- ✓ Accidental falls inside the store.
- ✓ Contamination of rice
- ✓ Incidences of aflatoxin

Mitigation measures

- ✓ Construct the facilities as per the recommended plans that include fencing, toilets and water pumping site access steps to the reservoir and paths among others.
- ✓ Develop By-laws that are acceptable to all.
- ✓ Train the group members on aflatoxin testing kits and disposal of contaminated rice.
- ✓ Restrict non staff inside the stores and rice milling machine.
- ✓ Allocate designated waste disposal areas within the project area

7.3.3.2 Gender Based violence and Sexual Harassment

While such cases are difficult to assess, there is likelihood of rape cases during project operations. This impact is triggered during project operation phase when the project management unit fails to comply with the Gender Inclusivity requirements in entire project management team as required by Gender Policy 2011 and 2/3 gender rule.

Mitigation

- Integrate provisions related to sexual harassment in the employee COC in project management committee
- The Project management committee in collaboration with county department of social services will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including: effective and on-going community engagement and consultation, particularly with women and girls; review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women

- The project management committee in collaboration with county department of social services shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment; etc
- The project management committee will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project management unit.

7.3.3.3 *Sexual Exploitation and Abuse (SEA)*

This impact refers to sexual exploitation and abuse committed at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project.

Mitigation

The SEA action plan will follow guidance on the World Bank 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:

I 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;

II Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights;

7.3.3.4 *Increased incidences of emerging diseases*

Due to labour influx, there may be cases of emerging diseases

Proposed Mitigation

- ✓ Awareness creation and sensitisation
- ✓ Education on prevention and control

7.3.4 **Negative Environmental and Social Impacts during Decommissioning Phase and Mitigation Measures**

7.3.4.1 *Negative environmental impacts during decommissioning phase*

7.3.4.2 Oil spills/Fuels and Lubricants

Oils and grease spillage on the ground may cause contamination to the soil and groundwater.

Proposed mitigation and management measures are:

Proper maintenance of vehicles and other equipment (using petroleum products) to avoid fuels and lubricants spills at the project site.

The proponent should properly handle, storage, and disposal off oils and greases and their wastes during decommissioning by ensuring that servicing is strictly done at designated servicing yard or external petroleum stations

7.3.4.3 Increased generation of solid wastes

Decommissioning activities will generate various solid wastes ranging from debris, wrappings, concrete, human wastes to food wastes etc. Poor handling and disposal of such waste will lead to environmental pollution.

Mitigation:

- Careful dismantling to ensure materials remain as re-usable as possible
- Selling or donating the re-usable or recyclable materials to avoid waste
- Cleaning and proper site rehabilitation by adhering to a NEMA approved Decommissioning plan

8 ENVIRONMENTAL SOCIAL MANAGEMENT AND MONITORING PLAN (ESM&MP)

8.1 Introduction

Along with the potential impacts presented in this chapter, proposed mitigation measures and monitoring aspects have also been highlighted for appropriate action. Some impact mitigation has

already been proactively addressed in the design, while others would be undertaken through considered incorporation in the implementation of the project and guided by the environmental management and Monitoring plan (ESMMP) developed under this report. The ESMMP provides a general outlay of the activities, associated impacts, mitigation action plans and appropriate monitorable indicators that can be. Implementation timeframes and responsibilities are also defined. The responsibility for the integration of the mitigation measures for the proposed development lies with the Contractor during the construction stage while the project management unit takes over the duty upon commissioning of the project. At every stage, the objective would be to ensure that the specified mitigation measures are implemented.

8.1.1 Environmental Social Management& Monitoring Plan

The scope of this environmental social management and monitoring plan (ESMMP) document is to give guidelines to all parties involved in construction, maintenance and utilization of the rice curing and product store in fulfillment of environmental and social requirements. The management plan has a long-term objective to ensure that Environmental management conditions and requirements are implemented from the start of the project and post construction period, and Precautions against damage to environment and property and claims arising

Tables 8-1 form the core of this ESM&MP for the construction, operational and decommissioning phases of the proposed construction of the rice curing and product store project. In general, the tables outline the potential environmental, socio-economic, health and safety risks associated with the project and details all the necessary mitigation measures, their financial costs, as well as the persons responsible for their implementation and monitoring. The ESM&MP should be used as checklist in the initial environmental audit of the pro

Table 8-1: Environmental and Social Management and Monitoring Plan(EM&MP)

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
Construction phase						
Loss of vegetation	- only clear enough area for the site construction - Mature trees should not be cut unless extremely necessary. - Plant indigenous palatable plant species around the project site	- Number of indigenous palatable species planted - Acreage of grass cover on the embankments	Contractor	Continuous during Construction	reports/photographs -Site plan showing vegetation clearance	
Soil erosion	- All excavation works must be properly backfilled and compacted - Construction of water ways to drain water - Construction of gabions along the hotspots - Promote agroforestry upstream	- Length of gabions constructed - Acreage coverage of trees planted upstream	Contractor/Project management unit	Continuous	Reports Filed visits	
Increased noise and vibration generation	- Ensure PPE such as ear muffs are provided to the workers where necessary - Construction work be done during the day when people are away and also the outside environment is also noisy. - Ensure that the machines are serviced promptly as required	- No of PPE provided to workers - No. of cases reported relating to noise pollution	Contractor	Continuous during Construction	- Noise Levels - Duration/time of the day - Reports	Contractor cost
Air Quality Degradation due to dust and	✓ Minimize emission of exhaust fumes through servicing of machinery in use	No of Workers/vehicle	Contractor	Continuous during Construction	-site visit /reports Photographs	Contractor cost

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
exhaust emissions	✓ Use only heavy machinery and equipment during daytime ✓ Regular servicing of equipment	- operators sensitized on reduced emission • No. of PPE supplied			Sensitization meeting report	
Oil spills/Fuels and Lubricants	✓ Vehicle maintenance should be done on purpose built • Impervious concrete platforms with oil and grease traps. • Standard operating practices for re-fueling mobile equipment such as a minimum 15m from any water channel should be practiced	• No of Oil and grease traps established	Contractor	Construction phase	• Records Register on vehicle maintenance	Contractor cost
Increased generation of solid wastes	• The base camp of the contractor should or construction equipment should not be in the catchment area of the . • appropriately • Recycle any useful material during foundation construction phase • Use of an integrated solid waste management system i.e., the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle where possible. • Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at site; • Waste collection bins / receptacles to be provided at the project site	• No. of waste bins/receptacle • Quantity of Waste • No of designated waste collection points	Contractor Site Engineer	Continuous during Construction	• Type of waste Designed waste collection points established • Waste collection company engaged	Contractor cost

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
Visual Impacts and aesthetics	- Regular site clean-up to prevent littering - All excavated material should be compacted to minimize soil erosion - Restrict project activities to the actual project site - Establishment of a site store for storage of materials, tools and equipment	- Volume of waste cleaned up - Area compacted - Number and size of materials stores erected - Area of site rehabilitated	Contractor	Throughout the construction phase	- Cleaning up of waste - Compacting loose soils - Establishment of a materials store - Site rehabilitation	Contractor cost
Occupational Health and safety Hazards	- Provide workers with appropriate personal protective clothing: helmets, boots and overalls - Implement a programme of assessment of routine monitoring of worker health. - Redesign manual processes and rotate work tasks to reduce heavy lifting/repetitive activities, and where possible install mechanical lifting aids. ✓ Provide a well-stocked first aid kits on the site - Restrict proposed site for only authorised persons	- No. of HSE trainings - No. PPE provided - First Aid Kits availability - Availability of sanitation facility - No. of Accidents/incidents	Contractor/Project management unit	Continuous during construction	- PPE provided - Recorded accidents occurrences and near misses - OSH sensitization conducted - Field visits	
	Social Impacts					

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
Increased Spread of STD, HIV & AIDS,	- Community sensitization on HIV/AIDs - Contractor to sensitive workers and provide condoms on site as well as within the project area.	- No of Cartons of condoms distributed and to the relevant persons - No. of HIV trainings and awareness campaign - Code of Conduct	Contractor /Project management committee	Throughout construction Period	Reports	
Gender based violence and sexual harassment	- Integrate provisions related to sexual harassment in the employee COC - The Contractor to ensure compliance with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse Community and construction workers awareness on GBV - Separate toilets for each gender - Establishment of appropriate grievance redress mechanisms	- No. of cases of GBV reported - Number of sensitization workshops	Contractor/project management unit	Throughout construction Period	- Human resource policy in place - Code of Conducts signed - Separate sanitary convenience	
Child abuse	- Contractor develops and implements a Children Protection Strategy - All staff signing and committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behaviour - Children under the age of 18 years should not be hired on site as	- Number of school going children who have dropped out of school - Number of workers to have ratified to child protection strategy - No. of children/persons	Contractor/project management unit	Throughout construction Period	- Child Protection Strategy - Workers signing and committing to child protection strategy	

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
	provided by Child Rights Act (Amendment Bill) 2014. Wherever possible, ensure that another adult is present when working in the proximity of children.	below the age of 18 yrs employed			Age of employees	
					Sub Total	100,000
Operational Phase Environmental Impacts						
Flooding	- Construct dykes and water ways - Establishment of tree nursery - Establishment of agroforestry within surround farms upstream	Length of dykes and water ways - Number of established agroforestry farms upstream - Grass cover on the embankment of canals	National Irrigation Authority Proponent Rice farmers NAVCDP Siaya team and community	Throughout operation	Agroforestry farms established Reports Field visits/observation	30,000
Contamination of the raw rice with aflatoxin	- Provision of aflatoxin testing kits during curing	Tons of rice tested for aflatoxin contamination	Proponent Usonga Rice Producers Cooperative Society and community	Throughout operation	Reports on amount contaminated rice in the store	50,000
Rodents and pests in the rice stores	Use of bio fumigants to get rid of the rodents and pests	Rodents cleared in the rice stores	Proponent Usonga Rice Producers Cooperative Society and community	Throughout operation	Reports on amount rice infested pests in the store	50,000

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
Infestation of the stores by birds	Use of Integrated pest management	Number of birds cleared	Usonga Rice Producers Cooperative Society and community	Throughout operation	Reports on amount rice infested pests in the store	50,000
Solid Waste generation from stores operation	- Use of an integrated solid waste management system i.e., the 3 R's: 1. Reduction at source 2. Reuse 3. Recycle where possible. - Reuse packaging materials such as cartons, cement bags, empty metal and plastic containers to reduce waste at site; - Waste collection bins / receptacles to be provided at the project site	- No of Designed waste collection points established -No of Waste collection companies engaged - Amount of solid waste generated	Usonga Rice Producers Cooperative Society and workers in the rice milling plant	Throughout operation	- Waste storage points -Waste disposal facilities/contract collector	50,000
Population Pressure and Water Demand for irrigation	- Develop schedule on water use for irrigation and work together with National Irrigation Authority - Local community bylaws should be established on water use	- Number of irrigation farm blocks accessing water - Bylaws established on water extraction	National Irrigation Authority and the Rice farmers	Throughout operation	- Reports - Field observation	
Water quality nitrate pollution by fertilizers upstream	- By laws should take care of water quality issues associated with environs - Train on safe use of organic fertilizers that are biodegradable	Number of farmers trained on use of organic fertilizers	Proponent NAVCDP Siaya team and community	Throughout operation	- Reports - Field observation - Farmers practising organic farming	30,000

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
Oil spills	Standard operating practices for application of oils lubricants on mobile equipment to be a minimum 15m from any water course/ channel should be practiced	Amount of Oil and grease traps used	Proponent NAVCDP Siaya team and community	Throughout operation	Records Register on machinery maintenance	
Possible breeding of disease-causing vector due to stagnant water Increase in water borne and other related diseases	- Provision of treated nets to the targeted communities -Equip health centres with drugs -Provision of water treatment tablets	- Number of targeted households provided with Mosquito nets, - Water treatment tablets and sensitized	Siaya County Department of Public Health. Proponent NAVCDP Siaya team, Siriwo cooperative society members and community	Throughout operation	Reports	
Operation phase Social impacts						
Leadership issues in management	- Periodical capacity building to the PMC by NAVCDP - Elected finance committee with appropriate gender representation to handle funds. - Periodic update to the members financial status- transparency	- Number of trainings conducted - Number of meetings held - No of reported grievances - Periodic financial status updating	Proponent NAVCDP, Siaya County department of social services Siriwo Cooperatives society members community	Throughout operation	- Training of PMCs - GRM mechanisms - Periodic financial status update	
Conflicts on water use for irrigation	✓ Establish a grievance redress mechanism targeting communities	Number of reported cases on grievances	Proponent Proponent NAVCDP Siaya	Continuous	- Reports - Existing records	

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
	and other project stakeholders but not ✓ Ensure the grievance redress mechanism is available to the affected community members and stakeholders at no cost • Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all,	• Number of sensitization awareness creation workshops on GRM • Number of community members trained on GRM	team and community			
Occupational Health and safety Hazards	✓ Provide workers with appropriate personal protective clothing: helmets, boots and overalls. ✓ Provide a well-stocked first aid kits on the site ✓ Restrict livestock and human movement inside the reservoir by fencing the site. ✓ Put Signage (Warning signs in strategic sites)	• No. of accidents reported • Number and types of PPE procured • No. of sensitization meetings	Proponent NAVCDP Siaya team and community	Throughout operation	• Reports on Safety records • Reports on number first Aid Kits available • Photos of signage sites	
GBV and Sexual harassment	• Integrate provisions related to sexual harassment in the employee COC in project management committee • PMC in collaboration with county department of social services ensure that gender-based violence at the community level is not triggered by the Project	• Number of recorded cases • Number of sensitization workshops • Human resource policy	Proponent NAVCDP Siaya team and community	Throughout operation period	• Code of Conducts signed • No. of cases of GBV reported	

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
	The project management committee will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project management unit.					
Sexual exploitation and Abuse (SEA)	- Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management; - Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and	•Number of recorded cases •Number of sensitization workshops •Human resource policy	Proponent NAVCDP Siaya team and community	Throughout operation phase	• Code of Conducts signed • No. of cases of GBV reported	

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
	girls about social risks and their PSEA-related rights;					
					Sub Total	
Decommissioning phase						
Air Quality Degradation due to dust and exhaust emissions	- Workers engaged in decommissioning should be provided with appropriate PPE - Sprinkle water on uneven/bare areas at project site areas and nearby access roads to minimize dust	- No. of workers sensitized - PPE provided Frequency of watering	Contractor	Continuous during decommissioning	- Workers/vehicle operators sensitized on reduced emission - PPE provided to workers - Sprinkling of water	
Increased generation of solid wastes	- Careful dismantling to ensure materials remain as re-usable as possible - Selling or donating the re-usable or recyclable materials to avoid waste - Cleaning and proper site rehabilitation by adhering to a NEMA approved Decommissioning plan	- Recycling solid waste - Rehabilitated site - Designed waste collection points established - Waste collection company engaged	Contractor	Continuous during decommissioning	- Quantity of waste - Area rehabilitated - No. of solid waste bins/receptacles - Type of Waste	

Potential Impact	Proposed Mitigation Measures	Performance Monitoring Indicator	Responsibility	Timeline	Means of Verifiable	Cost (Ksh)
Loss of livelihood	The impact is low as it is anticipated and can be mitigated by training farmers on other forms of business and other strategies for continuous improvement of local breeds	Training on alternative business	Proponent	Continuous during decommissioning	No. of trainings conducted	
Occupational Health and Safety Hazards	- Provide appropriate personal protective equipment (PPE). - Train workers in general safety procedures including first aid and fire safety. - Use designated routes for machinery and personnel - Ensure that there are provisions for reporting incidents, accidents and dangerous occurrences	Number of PPEs provided •No. of HSE trainings • •First Aid Kits availability •No. of Accidents/incidents •	Contractor	Continuous during decommissioning	Training of workers on safety •Provision of PPEs •Install first aid kits •Reporting of incidents •Set up sanitation facilities •	
Sub Total						
Total Cost of ESM&MP(Kshs)						

9 CONCLUSION AND RECOMMENDATION

9.1 Conclusions

From an environmental point of view, the project poses minimal negative impacts especially due to its size and normal impacts associated with any excavation works. The negative impacts were found to be of low magnitude and can be easily mitigated at minimal costs or cost free. On the other hand, the positive impacts of the project are mainly socio economic, and would contribute immensely towards the achievement of vision 2030 objectives of wealth creation, income generation and poverty reduction within the rural communities of Kenya. The potential negative impacts of the project are low, easy to mitigate, and the benefits to the community are very significant. In addition, if the proponent and the community undertake the necessary measures to mitigate the negative impacts as identified in this report, then there should be no reason to prevent the project from proceeding on as planned.

9.2 Recommendations

The proposed curing and product store has potential to have multiple benefits to the community and the surrounding areas. The positive impacts of the project far out ways the negative impacts of the project.

To ensure environmentally sustainable development, the following recommendations should be considered for implementation.

- All materials from the demolished existing bond to be reused maximally and if unusable the materials to be disposed according to the existing rules and regulations
- The curing and product store project will lead to minimal post-harvest losses and improved access to markets the few negative impacts identified have been adequately mitigated through diverse measures proposed in the ESMP and thus we recommend that the project be considered for an ESIA clearance and subsequent implementation
- Finally, the potential negative impacts of the project are low, easy to mitigate and the benefits to the community are very significant. If the proponent and beneficiaries undertake the necessary measures to mitigate the negative impacts as identified and recommended in the EMP, then there should be no reason to prevent the project from proceeding on as planned

10 REFERENCES

- Government of Kenya (2010). The constitution of Kenya, government printer, Nairobi, Kenya
- Government of Kenya (2000): Kenya gazette supplement Acts, Environmental Management and Coordination Act Number 8 of 1999 and 2015 Amendments (Cap 387). Government printer, Nairobi, Kenya.
- Government of Kenya (2003): Kenya gazette supplement number 56. Environmental Impact Assessment and Audit Regulations, Government Printers, Nairobi, Kenya.
- Government of Kenya (2007): The Occupational Safety and Health Act, Government Printers, Nairobi, Kenya.
- Government of Kenya (2012): The Land Act, Government Printer, Nairobi, Kenya.
- Government of Kenya (2012): The Land Registration Act, Government Printer, Nairobi
- Government of Kenya (2012): The National Land Commission Act, Government Printer, Nairobi, Kenya.
- Government of Kenya. (2019). Energy Act, 2019, government printer, Nairobi, Kenya.
- Government of Kenya. (2012). The County Government act, 2012, government printer, Nairobi, Kenya
- Government of Kenya. (2012). The National Land policy, 2012, government printer, Nairobi, Kenya
- Government of Kenya. (2006). Museums and Heritage Act, No. 6 of 2006, government printer, Nairobi, Kenya.
- Government of Kenya. (2007). Kenya Roads Act No. 2 of 2007, government printer, Nairobi, Kenya.
- Government of Kenya. (2012). Public Health Act (Cap 242), government printer, Nairobi, Kenya.
- Government of Kenya. (2008). Vision 2030, government printer, Nairobi, Kenya.
- Government of Kenya. (2012). National Environmental Policy, government printer, Nairobi, Kenya.
- Government of Kenya. (2014). National Energy Policy, government printer, Nairobi, Kenya
- Government of Kenya. (2011). Gender Policy, government printer, Nairobi, Kenya.
- Kenya gazette supplement Acts Land Planning Act (Cap. 303) government printer, Nairobi
- Kenya gazette supplement Acts Physical Planning and Land Use Act, 2019 government printer, Nairobi
- Kenya gazette supplement Acts Water Act, 2016 government printer, Nairobi
- Kenya gazette supplement number 69, Environmental Management and Coordination(Waste management) Regulations 2006, Gvernment printer, Nairobi
- Kenya County Climate Risk Profile Series 2018, Climate Risk Profile for Siaya County.
- Noise Prevention and Control Rules 2005, Legal Notice no. 24, Government Printers, Nairobi
-
- Siaya County Government. (2022). County Integrated Development Plan (CIDP) for 2022-2027
- T
- The Occupational Safety and Health Act, 2007, Government Printers, Nairobi
- World Bank (1998). Environmental Assessment Sourcebook volume II: Sectoral Guidelines. World Bank, Washington.

Annex 1: Copies of filled questionnaires

**QUESTIONNAIRE (STAKEHOLDERS): ENHANCED RICE PROCESSING AND MARKETING PROJECT
USONGA WARD, ALEGO USONGA SUB-COUNTY IN SIAYA**

INTRODUCTION

Ministry of Agriculture and Livestock Development, State department of crops have received funding from the World Bank, through National Agricultural Value Chain Development Project (NAVCDP). It intends to put up a rice paddy-curing store and finished products store, put in place green energy by hybridization of power use, improve paddy harvesting efficiency through mechanization and undertake capacity building of CIG/VMGs and provision of input subsidy. We have been assigned the responsibility to carry out an **ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT** for the development. We are pleased to seek your views (as beneficiary/neighbor/stakeholder) concerning the intended development. For this purpose it would be appreciated if you would kindly fill in this brief questionnaire. The information is STRICTLY for the purpose of this study and shall remain confidential

1. Age of the Respondent..... 25 Years
2. For how long have you resided or worked in this area..... 2 Years (years)
3. Do you know about the proposed enhanced Rice Processing and Marketing Project Under the National Agricultural Value Chain Development Project (NAVCDP)?

Yes

☒

No

☐

4. In your opinion, in what ways will the above Rice Processing and Marketing Project benefit the community, country and nation in general?

i.

ii.

Community: more employment opportunity to the local

Country: Increases the GDP of the country.

Nation: It will ensure stable food

security of the nation.

vi.

5. Mention the negative impacts that the may pose to the neighborhood and environment in general

i.

Emission of Industrial fumes to the air.

ii.

Deposition of the domestic effluents.

iii.

Loss of biodiversity during construction works.

6. What do you think can be done to mitigate the negative impacts you have listed in 5 above?

- i. Onsite treatment of the Industrial effluent.
- ii. Proper garbage installation for deposition of domestic wastes.
- iii.
- iv. Do a ground study to ensure minimum disturbance of the soil microbes.

7. a) Do you anticipate any conflict or complain against proposed Rice Processing and Marketing Project with respect to:

8.

- Land Yes ☐ No ☒
If yes indicate
- Water Yes ☒ No ☐
If yes indicate Flooding during heavy rain seasons.
- Public health and safety? Yes ☐ No ☒
If yes indicate
- Loss of livelihood? Yes ☐ No ☒
If yes indicate
- Cultural/heritage? Yes ☐ No ☒
If yes indicate
- Others

(b) If any in 6(a) above what are the mechanism to put in place to resolve the conflicts/complaints amicably

- i.
- ii. Flooding can be mitigated by grading the area under construction.
- iii.
- iv.

9. On the whole, would you have any objections to the project being implemented...? *Yes*

I suggest that may the project provide casual labourers from the local as a way of employment of residents

10. In which category do you fall? (tick where applicable: you can tick more than one box)

Neighbour resident ☐ Project official ☐ Stakeholder ☒

Stakeholder ☐ Community leader/Member ☐

Other Specify ☐

PERSONAL INFORMATION

Name of Respondent *CALVINE OLOO* IDNo. *37939622*

Mobile *0797930452* Signature *Calvin*

Thank you for your cooperation

[Please provide these details for the purpose of authentication in this EIA study only]

QUESTIONNAIRE (STAKEHOLDERS): ENHANCED RICE PROCESSING AND MARKETING PROJECT
USONGA WARD, ALEGO USONGA SUB-COUNTY IN SIAYA

INTRODUCTION

Ministry of Agriculture and Livestock Development, State department of crops have received funding from the World Bank, through National Agricultural Value Chain Development Project (NAVCDP). It intends to put up a rice paddy-curing store and finished products store, put in place green energy by hybridization of power use, improve paddy harvesting efficiency through mechanization and undertake capacity building of CIG/VMGs and provision of input subsidy. We have been assigned the responsibility to carry out an ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT for the development. We are pleased to seek your views (as beneficiary/neighbor/stakeholder) concerning the intended development. For this purpose it would be appreciated if you would kindly fill in this brief questionnaire. The information is STRICTLY for the purpose of this study and shall remain confidential

1. Age of the Respondent..... 57 YEARS
2. For how long have you resided or worked in this area..... 20 YEARS (years)
3. Do you know about the proposed enhanced Rice Processing and Marketing Project Under the National Agricultural Value Chain Development Project (NAVCDP)?

Yes ☒ No ☐

4. In your opinion, in what ways will the above Rice Processing and Marketing Project benefit the community, country and nation in general?

- i. CREAT EMPLOYMENT
- ii. AVAILABILITY OF RICE
- iii. AVAILABILITY OF READY MARKET OF RICE
- iv. IT ENABLE HIGHER PRODUCTION OF RICE
- v. IMPROVE LIVING STANDARDS OF OUR PEOPLE
- vi. IT WILL OPEN OUR PEOPLE WITHOUTSIDE WORLD, IMPROVE OUR INFRA

5. Mention the negative impacts that the may pose to the neighborhood and environment in general

- i. MOSQUITOES THAT CAUSE MALARIA
- ii. BILHARZIA IS CAUSED
- iii. WHEAT THAT IS PRODUCED AFTER MILLING OF PADDY RICE

6. What do you think can be done to mitigate the negative impacts you have listed in 4 above?

- i. To clean the canals to reduce ^{volume} water will reproduce
- ii. To have Public awareness against diseases
- iii. To Teach D. m. 1

9. On the whole, would you have any objections to the project being implemented...? NO

10. In which category do you fall? (tick where applicable: you can tick more than one box)

Neighbour resident ☒ Project official ☐ Stakeholder ☐

Stakeholder ☐ Community leader/Member ☐

Other Specify ☐

PERSONAL INFORMATION

Name of Respondent ALFRED P. OBIOR IDNo. 94632-91

Mobile 072774476 Signature [Signature]

Thank you for your cooperation

[Please provide these details for the purpose of authentication in this EIA study only]

conflicts/complaints amicably

- i. Need consultation among all members
- ii. Having ^{capacity} Public building among the members
- iii. cleaning all the canals
- iv. _____

Annex 2: Minutes of public consultation meeting

MINUTES OF THE PUBLIC PARTICIPATION MEETING ON ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT PREPARATION FOR THE SIRIWO RICE MILL PROJECT

HELD ON 31ST MARCH 2025 AT SIRIWO RICE MILLS GROUND

PRESENT

(Refer to the attached attendance register for details)

AGENDA

Prayer and Introductions

Scope of Works

Environmental and Social Impact Assessment (ESIA) Development

Questions and Answers (Q&A) / Closing Remarks

MIN 01/31/03/2025: PRAYER AND INTRODUCTIONS

The meeting commenced at 10:00 AM with an opening prayer led by Mr. Joseph Omondi. This was followed by self-introductions from all attendees.

The NAVCDP Environment Officer provided an overview of the day's proceedings and the objectives of the National Agricultural Value Chain Development Project (NAVCDP). He explained that the Siriwo Rice Mill Project aims to enhance rice processing and marketing within the community.

Furthermore, the Environment Officer emphasized the importance of community participation in identifying potential environmental and social impacts and proposing mitigation measures for integration into the ESIA report. He encouraged attendees to express their views freely to ensure an inclusive and beneficial project.

MIN 02/31/03/2025: SCOPE OF WORKS

The Quantity Surveyor (QS) from the County Department of Public Works provided a detailed breakdown of the project layout and components, which include:

Construction of curing stores at the back of the milling plant

Development of a products store and washrooms on one side of the front of the milling plant

Shops and parking spaces on the other side of the milling plant's front

- ✓ Installation of three (3) additional drying floors

The QS elaborated that the project would be implemented in phases, aligned with funding availability. The initial phase will prioritize the construction of:

- ✓ Two curing stores (each 8 meters in height)
- ✓ Aflatoxin testing pit
- ✓ Solarization of the existing mills
- ✓ Installation of a power backup generator
- ✓ Procurement of key agricultural equipment, including a combined harvester, rice thresher, transplanter, forklift, and weighing scale

Community members were informed that farmers' cooperative representatives were actively involved in the project's design phase, ensuring local ownership with only minimal technical guidance from experts. Additionally, the QS assured attendees that adjustments to the Bill of Quantities (BQ) could be considered if a more pressing community need arose, provided there was no cost variation.

Table 1.1 Concerns by ESIA meeting attendants and Responses by Consultants and Nav

SN.	Issues raised by the members	Brief explanation	Response
	Employment	During pan construction, preference will be given to the locals with emphasis on the youth During operation phase employment will be generated by sale of water, irrigation and sale of farm produce	The community agreed and promised to provide both skilled and skilled labour
	Breakage of the banks	The pan may break its banks when it is completely full	The have done a feasibility study and discussed with local residents the history of the site
	Erosion	Stakeholders residing around the pan catchment sites will be encouraged to plant trees and construct terraces along contours to reduce soil erosion	The community requested for capacity building on SLM from the project management
	Mosquitoes/Malaria incidences	The pan will be installed with fish that can eat mosquito larvae The surrounding community members will be provided with mosquito nets	The pan management committee was asked to seek for support from the county government and local supporting institutions to provide mosquito nets
	Maintenance and sustainability of the pan	An account for the pan be established for running the funds collecting whenever water is drawn from the pan	A sustainability strategy to be put in place so that pan maintenance issues can be addressed by a committee which has a funding mechanism
	Theft of pan equipments i.e solar panels	There was a concern that there will be theft and vandalism of equipments	The PMU to engage the youth in marinating and running the pan

MIN 03/31/03/2025: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) DEVELOPMENT

The session was attended by farmers, cooperative committee leaders, the ward administrator, the area chief, engineers specializing in irrigation and surveying, environment officers, and social officers. The Environment Officer underscored the need for inclusive participation, urging attendees to invite more women, youth, and persons with disabilities (PWDs) to future meetings to ensure equitable project implementation.

The lead experts stressed that while the project was community-driven, environmental sustainability should not be compromised. Attendees were issued questionnaires and guided in identifying potential impacts of the curing stores during both implementation and operational phases. The following key impacts and benefits were highlighted:

- ✓ Reduced post-harvest losses: The Chairman of Usonga Community Development and Disaster Committee (CDDC) noted that the curing stores would provide safe storage, reducing wastage while seeking market opportunities.
- ✓ Job creation: A community member, Mr. Kennedy, mentioned that the project would generate employment, including opportunities for storekeepers.
- ✓ Market competitiveness: A former Siriwo contractor stated that improved infrastructure would enable local farmers to compete in national and international markets.
- ✓ Enhanced safety: Mr. Joseph Ochieng' observed that dedicated storage facilities would minimize accidents currently caused by storing rice in the same area as milling machines.
- ✓ Reduction in losses due to bird predation: Improved storage would prevent rice from being eaten by birds.

The area drainage system was reported to have improved significantly due to the efforts of National Irrigation Authority (NIA), Lower Nzoia Project, and Siaya County Government. The common diseases in the area include bilharzia and malaria, with natural bird species (locally known as 'ogonglo') aiding in the control of bilharzia-spreading mollusks.

Available infrastructure and amenities near the project site include:

- ✓ Sumba Dispensary (2 km away)
- ✓ Uwasi Comprehensive School (200m away)
- ✓ Assistant Chief's Camp (1 km away)
- ✓ NIA Office (3 km away)

The project site is accessible via the Uwasi-Boro-Siaya road, with Siaya to Boro being a Class C tarmac road, while Boro to Uwasi is a murrum road leading to the mill's entrance.

Farmers were encouraged to use only farm chemicals accredited by NIA experts or County Agriculture Extension Officers and to embrace Integrated Pest Management (IPM).

On social aspects, the expert warned that economic and infrastructure development may lead to an influx of people, increasing insecurity and socially related diseases. In response, the Area Chief assured attendees that plans were in place to establish an Administration Police (AP) camp and a health center nearby. Additionally, awareness programs would be conducted through Chiefs' Barazas to promote responsible social behavior.

MIN 04/31/03/2025: QUESTIONS AND ANSWERS (Q&A) / CLOSING REMARKS

Q1: Can a fully equipped first aid room be included in the wash area outlined in the BQ?

Response: The QS stated that this proposal would be given serious consideration.

Q2: Can farmers be allowed to use chemicals to eliminate birds that are damaging their rice?

- Response: The Environment Officer and Lead Expert strongly discouraged this, citing the potential for environmental degradation and increased health risks. Research on alternative solutions is ongoing.

Closing Remarks

- The Area Chief noted that this was the fourth public participation meeting on the Siriwo project. He confirmed that the process of changing land use from a cattle dip to a rice mill was underway, with the National Land Commission (NLC) already engaged. He handed over relevant documents to the NAVCDP Officer.
- The Farmers' Cooperative Chairman expressed gratitude for the expert insights and pledged full support for the project, urging members to spread awareness within the community.

- Mr. Gabriel Omondi, a contractor from a previous phase, acknowledged the project's progress and looked forward to continued improvements.

CONSENSUS: All attendees unanimously approved the project.

ANY OTHER BUSINESS (A.O.B)

The Vice Chair of the Cooperative urged members to attend future meetings diligently and encourage female participation.

The meeting concluded with a closing prayer by Joseph Omondi.

Prepared by: Chief
Peter Odongo

Secretary:

Date 31st  March 2025

Confirmed By John Makhulo
Chairman Siriwo Rice farmers Cooperative society
:

Chairperson:



Date: 31st March 2025