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

PROPOSED MAZIWA LITA KUMI PROJECT

SUMMARY PROJECT REPORT (SPR)

PROJECT PROPONENT

Kenya climate Samrt Agriculture -Uasin Gishu coordinating Unit

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PROJECT SPONSOR

GOVERNMENT OF KENYA/COUNTY GOVERNMENT OF UASIN GISHU WITH SUPPORT FROM THE WORLD BANK

JUNE, 2021

DECLARATION

DECLARATION

This Environmental Social Management Plan (ESMP) study Report is submitted on behalf of Kenya Climate Smart Agriculture Project (KCSAP) Uasin Gishu Coordinating Unit under the funding from the World Bank Group. To my knowledge, all information contained in this report is accurate and a true representation of all findings as relating to the project.

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PROPONENT

This Report was commissioned by Kenya Climate Smart Agriculture Project Uasin Gishu coordinating unit herein referred to as project Proponent.

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Designation .....

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ACRONYMS

IAPs -	Interested and Affected Parties
NEMA -	National Environment Management Authority
EMSMP -	Environmental Social Management and Monitoring Plans
EMCA -	Environmental Management and Monitoring Act
CPP -	Consultation, Public involvement and Participation
KCSAP	Kenya Climate Smart Agriculture Project (KCSAP) Project
ToR -	Terms of Reference
CBD -	Convention on Biological Diversity
BOD -	Biological Oxygen Demand
NGO	Non-Government al Organization
GoK	Government of Kenya
OSHA	Occupation Health and Safety Act
AI	Artificial Insemination
PPE	Personal Protective Equipment
PAD	People Able Differently

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EXECUTIVE SUMMARY

Operation *Maziwa Lita Kumi* is a Kiswahili phrase and a rallying call aimed at increasing milk productivity from the current average production of 5litres to an average production of 10 liters per household.

The proposed project covers all the six sub-counties in Uasin Gishu County which are Turbo, Kesses , Moiben , Kapseret , Ainabkoi and Soy. It is a pilot model of 12 Farmer Cooperative Societies within Uasin Gishu County who have been selected out of the 62 with chilling plants. A total of 4800 dairy cows will be identified, synchronized and served using sexed semen and at the same time a feeding and management regime will be instituted in the respective farms.

The project seeks to optimally utilize the capacity of the remaining 50 chilling plants in the County which are currently under-utilized. Farmers from the selected cooperatives will be given the capacity to enable them increase milk production for the chilling plants. It is expected that the quality of milk will be enhanced, reducing health risks associated with unprocessed milk being channeled to the consumer.

The objectives of this ESMP are to describe the project and associated works and develop an Environmental Social Management Plan that covers all the phases of the project. The site-specific biophysical (Uasin Gishu County), socio-economic and human health related baseline conditions of the project area will be established. ESMP will also identify, describe elements of the community and environment likely to be affected by the project and/or likely to cause adverse impacts to the environment. It will identify all impacts associated with the proposed project and propose mitigation measures for the negative impacts

Public consultation was carried out and all the COVID 19 containment measures were followed during the public consultation process whereby a purposive method of data collection was used. Enumerators were sent directly to respondents in their homes and views recorded. The sampled respondents included Vulnerable and Marginalized Groups in the society with their views being taken. Interview guide was used to collect information from key informants who included local leadership, MCA, ward administrator and opinion leaders. Site visit was done to familiarize with status of site and reading of GPS coordinates. Data was analyzed and interpreted where issues of concern from the respondents formed part of the study report. The respondents and community at large supported and welcomed the projects full implementation

The activities performed in this project require a comprehensive Environmental and Social Management Plan (ESMP) to safeguard the environment and social concerns. The report identifies both positive and negative environmental and social impacts associated with the proposed project and recommends appropriate mitigation measures. Negative impacts identified in the project which could be mitigated include; Increase in road traffic volume especially during the delivery of milk and farm produces , Social economic impact (i.e. influx of people, leading to increase in social vices), Increased pressure on existing infrastructure and utilities, air pollution (dust, exhaust fumes), risk of electric shock during operation of farm machines, risk of fire outbreak on dry fodder storage and chilling plant areas, misuse of farm agro chemicals, risk of natural gas leakages in the farm biogas facilities and poor water quality in case of substandard drainages in the intensive dairy production units.

The proposed mitigation measures for the anticipated negative impacts include:, Provision and use of Personal Protective Equipment (PPEs) to all workers on site both during operation and decommissioning, observing proper waste management practices, undertaking soil erosion control measures and improving soil fertility, training of workers on safe use of Agro chemicals and disposal, Observation of good occupational safety and health practices. Detailed mitigation measures have been suggested in the ESMP chapter of this report.

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CHAPTER ONE
INTRODUCTION

1.1. Project Background.

The Kenya Climate Smart Agriculture Project Uasin Gishu coordinating unit intends to enhance milk deliveries to milk chilling plants within the Sub counties.

The project dubbed *Operation Maziwa Lita Kumi* is a Kiswahili phrase and a rallying call aimed at increasing milk productivity from the current average production of 5 liters per day per household to an average production of 10 liters per household per day.

The project will be implemented through a pilot model of 12 Farmer Cooperative Societies out of 62 with chilling plants within Uasin Gishu County. A total of 4800 dairy cows will be identified, synchronized and bred using sexed semen and at the same time a feeding and management regime will be instituted in the respective farms.

The project also seeks to optimally utilize the capacity of the remaining 50 chilling plants in the County which are currently under-utilized. Farmers from these cooperatives will benefit from trainings and will eventually increase milk delivered to the chilling plants. The project seeks to enhance the quality of milk because milk sold through unprocessed channel has perceived health risks. These risks include microbial load by the time it reaches the consumer. The proposed project will also provide opportunities for value addition and marketing which is currently under exploited.

1.2. ESMP Objectives.

The main objective of this report was to suggest the best ESMP for the proposed project. The specific objectives of the report were:

i. To describe the project and associated works
ii. To develop an Environmental Social Management Plan that covers all the phases of the project
iii. To establish site-specific biophysical (Uasin Gishu County), socio-economic and human health related baseline conditions of the project area
iv. To identify and describe elements of the community and environment likely to be affected by the project and/or likely to cause adverse impacts to the environment
v. To identify all impacts associated with the proposed project and propose mitigation measures for the negative impacts

1.2.1 Terms of Reference (TORs) for the ESMP report

The terms of reference given by the project proponent were as follows:

- Appraise all the Maziwa Lita Kumi Farmer Cooperatives project sites in order to provide a detailed evaluation and description of projects with a focus to determine their impacts, waste generation and disposal and socio-economic, health and safety aspects.
- Establish baseline information for the development of an environmental social management plan for the proposed project.
- Produce a comprehensive ESMP report for the Maziwa Lita Kumi initiative projects, based on the Gazetted Regulations (The Environmental Social Impact Assessment and Audit Regulations, 2003).
- Conduct and extensive public participation to include VMG and People able differently.
- Develop an environmental and social management plan outlining provision for environmental action plans, objectives and targets to ensure environmental performance both in the short- and the long term

1.3. Study Approach and Methods.

1.3.1. Environmental Screening.

This step was applied to determine the severity of impacts on each site. This was done in reference to requirements of the EMCA, 1999, and specifically the second schedule.

1.3.2. Literature Review.

This involved review of documented baseline information, relevant legislations documents, architectural drawings and analysis of literature for acquisition of secondary data.

1.3.3. Site Visits.

Site visits were done with the objective of familiarizing the team with the sampled project sites within the Uasin Gishu County.

1.3.4. Consultation and Public Participation.

Site visits were done in sampled project sites in the County to inform and get views from all stakeholders. These included provisions of sufficient information on the proposed project to stakeholders to allow them give their comments.

However, with the outbreak of **COVID 19** and subsequent guidelines by the Ministry Of Health prohibiting any social gathering, purposive methods of data collection was used where enumerators were sent to interview pre-determined list of members and take their views.

1.4 ESMP Report format

The report has several major sections presented as follows;

1. Project back ground
2. Project Description
3. Project Baseline information
4. Policy Legal framework
5. Consultation and public participation
6. Impact assessment in mitigation measures
7. Risk Assessment in the construction
8. Analysis of project alternatives
9. Integrated Pest Management framework
10. Proposed Environmental Social Management Plan

CHAPTER TWO:
PROJECT DESCRIPTION.

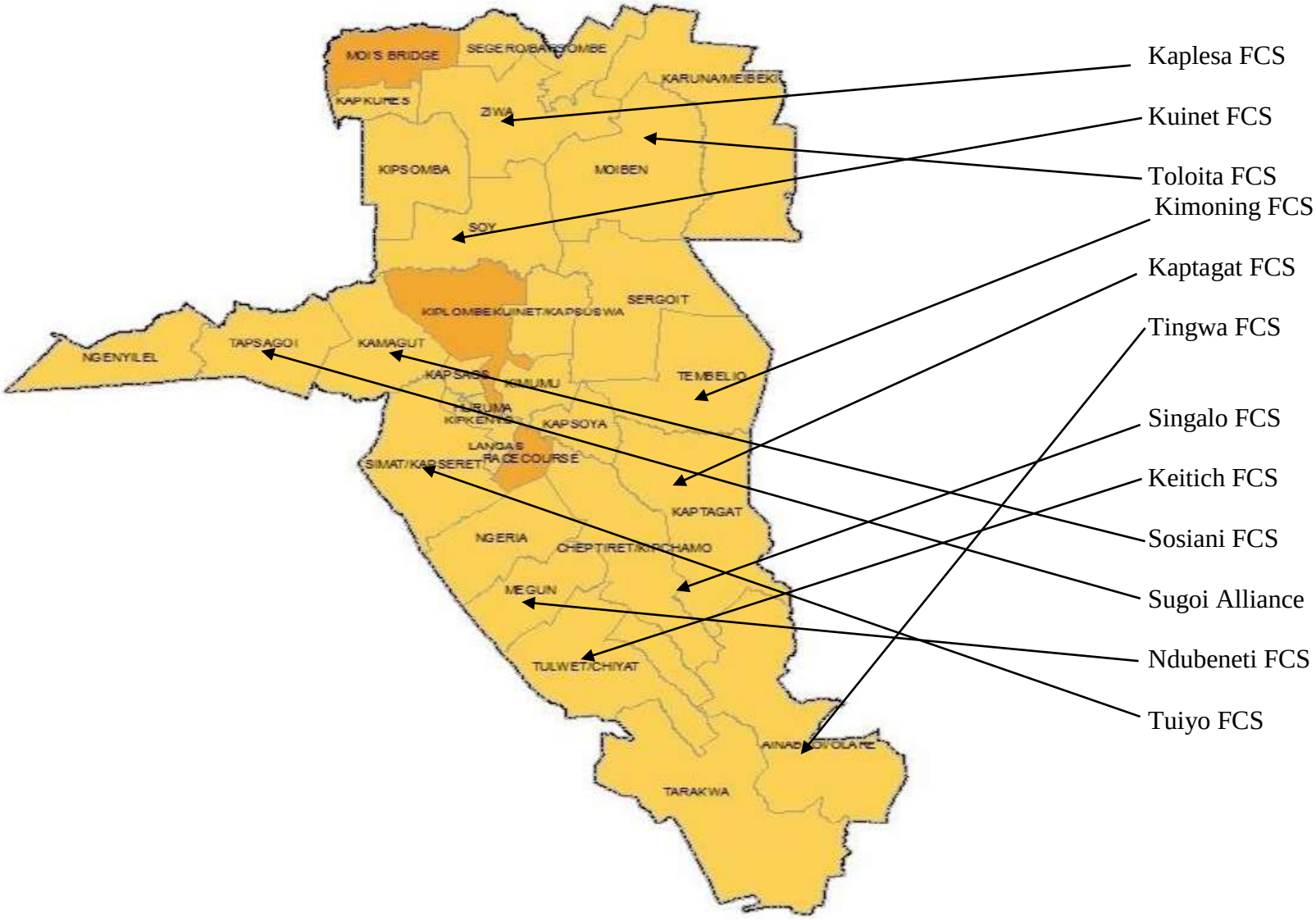
2.1. The Projects

The project seeks to improve milk production per household and increase deliveries to the milk bulking and chilling plants under the project dubbed "*Operation Maziwa Lita Kumi "*. The goal is to fully utilize the existing facilities through creating enabling and conducive environment for all the farmers at the community level.

Location of the projects

Maziwa Lita Kumi initiative "is being implemented in six sub counties within the County of Uasin Gishu. These sub counties are, Turbo, Kesses , Moiben , Kapseret , Ainabkoi and Soy

Fig. 1 Map of Uasin Gishu County showing Location of *Maziwa Lita Kumi Initiative* projects, (CIDP 2018-2022)



2.2. Project Outputs

The project Operation Maziwa Lita Kumi seeks to improve milk production within Uasin Gishu County by promoting various technologies and implementing the following activities as tabulated below:

Fig.2 Project activities, outputs and targets

Activities	Target
Establishment of Improved fodder production-	Boma Rhodes, desmodium, (>2400 acres) Brachiaria, Maize silage, Tree Lucerne they will provide the acarages
Fodder conservation	Hay->300,000bales Silage->74,400tonnes
Promotion of TMR, On farm dairy meal	>2400HH >=2.5kgs of DM/cow/day
Biogas	>60 digesters to be installed
Water conservation	Roof catchment>2400 households
Intensive dairy production unit	>240 units constructed
Synchronization	4800 dairy cows synchronized
Sexed semen	>4000 female calves
Milk products Value addition	Yoghurt &Mala >9600litres
Kitchen garden training	>2400 hh

2.2.1. Establishment of Improved fodder production

The proposed project intends to support farmer cooperatives by offering inputs and capacity building and the net effect is to improve milk production among the farmers.

2.2.2. Fodder conservation

This project intends to help farmers use improved ways of fodder conservation which includes silage and hay to maintain access to high quality feeds throughout the year. Conservation of fodder will maintain the steady supply of feeds to animals during dry season.

2.2.3 Promotion of TMR, On farm dairy meal

Total mixed rations (TMR) helps dairy cows achieve maximum performance and are the most common method for feeding high producing, intensive dairy cows in the world. The project seeks to improve dairy productivity by offering TMR services on-farm.

2.2.4. Biogas and water conservation

Biogas is a clean form of energy that is most preferred. Its benefits are eco-friendly i.e reduces Soil and Water Pollution, Produces Organic Fertilizer. It's a Simple and Low-Cost Technology that Encourages a Circular Economy while reducing indoor air pollution.

Water conservation has many benefits to the farm which includes protecting portable water resources by reducing strain on them. They use techniques like rain water harvesting and storage reducing over dependence on single water sources which and the effects of dry seasons.

2.2.5. Improve on Dairy production

This is through shortening the calving interval by estrus synchronization, which allows females (especially heifers) to conceive earlier in the breeding season, more effectively using AI and sexed semen and labor in detecting estrus

2.2.6 Synchronization and intensive dairy production

This is where cattle are confined in one place so that feed and water are brought to the animals. Farmers shall be trained to observe other animal husbandry activities such as animal health, which is carried out under intensive dairy production systems.

The advantages include:

- Cows are confined and therefore use most of the energy from feeds for growth and milk production.
- Saves land for other enterprises e.g. growing of Napier grass and other fodders for sale.
- Promotes on farm clean milk production and good calf rearing.
- Manure can be easily collected for the benefit of fodder crops
- The animals are better protected against diseases, especially tick-borne diseases.
- Close observation of the animals is possible, making heat detection and attendance to animals easier and faster.

- The animals are kept inside which is more secure and protect them from attack by predator.
- Protecting the animals from adverse weather patterns

2.2.7. Milk products Value addition

Value addition of milk is the amount by which the value of its raw format is increased at each stage of its production.

The price is then determined by what customers are willing to pay based on their perceived value.

The County targets to build capacity of the farmers for example in production of yoghurt, fermented milk, cheese among other dairy products. Capacity building of the farmers will ensure:

- Creating a point of difference from the competition.
- Have a competitive edge over other competitors

2.2.8. Kitchen Garden

A Kitchen garden is utilization of small space for production of vegetables for household use or for sale. Kitchen gardens have advantages such as:

- Fresh and Healthy Vegetables:
- Aesthetic Value
- Kitchen Gardening as a Hobby and Habit
- Plants are good for Aura

2.3 Materials Inputs.

The proposed project inputs include the following: -

i. Water; each chilling plant has respective sources of water i.e. borehole, hand dug well.
ii. Labor force; both skilled and non-skilled in all project sites.
iii. Milk; bulking chilling and sale through storage in a cooling system
iv. Slurry (cow dung, urine) to produce biogas to subsidize energy needs in farms and improve soil fertility by using it as manure.
v. Solar panels: for power as reliable sources of electricity to run the farm, homesteads and heating of water in chilling plants
vi. Compost and farm yard manure: Utilization of compost and farmyard manure to increase soil fertility
vii. Fodder and Silage: Storage of dry fodder and silage pits in individual intensive dairy production homes
viii. Farm inputs which include agrochemicals, seeds, veterinary services etc. which are used in the farm operations.

2.4 Utilities

2.4.1. Power

All the selected farmer cooperatives chilling plants are connected to the national power grid. Kenya Power has installed electricity in the premises.

In addition to this, each of the premises is also equipped with a stand by generator with auto-changeover capabilities which automatically switches on whenever power goes off.

Each of the Farmer Cooperatives chilling plant premises are also equipped with a solar panels and a water solar heating equipment to avoid over dependence on nonrenewable power sources to heat water and lighting purposes.

2.4.2 Water supply

Each of the chilling plant has appropriate water sources available within their locality, they include piped water, well and some have borehole sunk by the county government.

2.4.3 Government services

All Government services are found within, wards, sub counties and in the County headquarters if need be, and thus all other dependent services to this projects will be easy to find.

CHAPTER THREE:
BASELINE INFORMATION.

3.1. Introduction.

The proposed project covers all the six sub-counties in Uasin Gishu County. The County borders six counties, Elgeyo Marakwet County to the East, Trans Nzoia to the North, Kericho to the South, Baringo to the South East, Nandi to the South West and Bungoma to the West.

3.2. Physical Environment.

3.2.1. Climate.

Uasin Gishu County experiences high and reliable rainfall which is evenly distributed throughout the year. The average rainfall ranges between 624.9 mm to 1,560.4mm with two distinct peaks occurring between March and September; and May and August. The average temperature is 16.8 °C with the driest month being January. The warmest month is March with an average of 18.1 °C.

3.2.2. Drainage / Hydrogeology and Soils

Uasin Gishu County lies within the Lake Victoria catchment zone and all its rivers drain into the lake. The major rivers include Sosiani, Kipkaren, Kerita, Nderugut, Taragwa, and Sambu.

The soils which comprise of red loam soils, red clay soils, brown clay soils and brown loam soils mainly support maize, sunflower, wheat, pyrethrum, potatoes and barley farming. They also support livestock rearing and forestry.

3.2.3. Physical and Topographic Features.

Uasin Gishu County is a highland plateau with altitudes falling gently from 2,700 meters above sea level to about 1,500 meters above sea level. The topography is higher to the east and declines gently towards the western border. The County is physio graphically divided into three zones: the upper highlands, upper midlands and lower highlands. These zones greatly influence land use patterns as they determine the climatic conditions.

3.4. Socio-Economic Environment.

3.4.1. Population.

Uasin Gishu County is cosmopolitan and home to 1,163, 186 people as per the 2019 Population and Housing Census. Of this population 580,269 are male and 582,889 are female while there are 28 intersex persons in the county. Those of between ages of 0-14 years are 427,635 those of 15-64 are 700,908 while those above 65 years are 34,603 people according to the Kenya Census 2019. Of this population too, 652,981 are in the rural areas while 510,205 people live in the urban areas according to the report.

3.4.2. Socio Framework.

The three main livelihoods in the County are mixed farming (food crops and livestock), mixed farming (commercial crops and livestock –dairy) and formal/casual Employment.

Wheat, maize and dairy farming are done in large scale in most parts of the County. Various food and horticultural crops also do well in the highly arable land.

Eldoret town has manufacturing industries such as Raiplywoods, Rupa Textiles, Kenya Co-operative Creameries as well as Kenya Pipeline Company.

The county is renowned for exceptional performance in sporting activities, especially athletics. It is referred to as a County of champions and long distance marathon superstars owing to international athletic sports performances.

3.4.3. Land and Land Use.

Uasin Gishu County has an average land holding of 5 hectares in rural areas, and 0.25 of hectares within Eldoret Municipality with Land use practices varying considerably across the County. The most common land uses across the county is mixed farming with crop farming leading. The county is known for large scale grain faming, i.e. wheat, maize, and sunflower among many others.

3.4.4. Infrastructure

3.4.4.1. Roads, Railways and Airport.

The County has an extensive road network comprising of over 300 Kms of tarmac roads, 549 Kms of marrum and 377 Kms of earth roads. It has 179 Kms of railway line with 8 railway stations. In addition, there is an inland container depot, Eldoret International Airport and an airstrip.

3.4.4.2. Communication.

The County has about 95% mobile phone coverage which is provided by all the major service providers in Kenya. It also has 16 post offices and 4 sub-postal offices

3.4.5 Flora and Fauna

Uasin Gishu County is endowed with a number of thriving floral ecosystems. Among the forests in the county are Kapseret Forrest, Napkoi Forrest, Cingalo forest, Timboroa forest and Kipkurere forest which are still intact and not interrupted.

Fauna within the county are in the forests available, these include those who forage and those that depend on wild fruits like monkeys.

In all the proposed project areas there is no endangered flora or fauna. Most of the fauna have relocated to the forests over time owing to the increased human activity.

3.4.4.3. Energy Access

The major energy source in the County is from Kenya Power Company though most of the households use firewood as their main source of power.

3.4.4.4. Water Supply.

The main water resources in the County include dams, rivers, boreholes, shallow wells and springs.

3.5 Education /Literacy levels and livelihood activities in Uasin Gishu county

According to the Kenya Red Cross 2019 humanitarian needs assessment report, Uasin Gishu has 193, 499 primary school going pupils with over 6,081 students going to secondary school. The poverty rate in the County stands at 52% with food insecurity level of 42% pointing out that most households are faced with hunger for most part of the year. This is according to Uasin Gishu County development profile from the state department of devolution and planning May 2018. The communities in the County depends on mixed farming agriculture with most households depending on small scale maize farming and free-range dairy cows rearing for their economic survival.

CHAPTER FOUR
CONSULTATION AND PUBLIC PARTICIPATION, (CPP)

4.1. General Overview.

Consultation and public participation process is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated by EMCA 1999 section 58, on Environmental Impact Assessment for the purpose of achieving the fundamental principles of sustainable development. Therefore, this section describes the process of the public consultation and public participation followed to identify the key issues and impacts of the proposed project.

4.2. Purpose of the CPP Process.

The purpose of the consultation and public participation was to:

i. Disseminate inform about the project to the community
ii. Gather comments, suggestions and environmental concerns of the interested and affected parties about the proposed project.

4.3. Methodology used in CPP Process.

Since the onset of COVID 19 pandemic, the world faced a challenge in going on with daily social activities. All countries including Kenya laid down strict measures to curb the spread of the virus. All unnecessary public gatherings were banned, however since this project was of great importance, one public baraza was organized with a total of 60 people attending the meeting; the information obtained from the baraza was relied on in making this report. (see appendix 4 and 5)

In addition to this, 20 households in each of the six selected chilling plants were given questionnaires; the enumerators visited them in their homes to get their views via the questionnaire.

One FGDs were done in the six randomly selected chilling plants; in each of the FGD the members of the chilling plant expressed their views on the operalization of the chilling plant through the project. (see appendix 6 and 7)

The purpose for such interviews was to identify the positive and negative impacts and subsequently propose the mitigation measures of the negative impacts respectively. It also helped in identifying any other issues, which may bring conflicts in case project implementation proceeds as planned. The information gathered enabled the identification of the specific issues from the stakeholders' response, which provided the basis upon which the aspects of the ESMP was undertaken.

4.4. Results of CPP Process.

Results of respondents through questionnaires are as follows

4.4.1. Potential Positive Impacts Raised by the public.

1. Improved standards of living
2. Reduced community vices
3. Improved food and nutrition security
4. Improved hygiene and sanitation
5. Job opportunities
6. Locking out land grabbers
7. Prober utilization of land
8. Improved amenities
9. Improved community infrastructure
10. Promote commercial activities in the area

4.4.2. Potential Negative Impacts Raised by the public.

The negative impacts raised by respondents interviewed which are not of high risks which include:

- noise pollution owing to farm operations especially use of machines in the farm and in the chilling plants,
- increased strain on available water resources,

- Increase in social vices among others which comprehensive mitigation has been suggested in the ESMP of this report.

4.4.3 Proposed mitigation measures for Impacts raised by the public during the CPP.

Mitigation measures proposed for the anticipated negative impacts include the following:

i. Provision of Personal Protective Equipment (PPEs) to all workers/ employees on project sites i.e. farms and milk chilling plants.

ii. Observing proper waste management practices which include waste segregation at source, fully operationalizing the Reduce, Recycle, Re use methods of waste handling among many as suggested in the ESMP of this report
iii. Undertaking soil erosion control measures using appropriate technologies

iv. Continuous Capacity building to farmers, workers and employees in all levels of the project life
v. Observation of good occupation safety and health practices and compensation for those who might suffer injuries
vi. Use of low noise machines and avoiding unnecessary idling of vehicles
vii. Planting of appropriate trees in the project sites to act as wind breakers, noise sink and to trap any airborne pollutants like dust
viii. Proper use and storage of agro chemicals with clear records of incidences or accidences associated
ix. Proper checks and maintained of all biogas plants with fixes in any leakage
x. Regular fire risk assessment in all fodder and dry goods storages with provisions of adequate fire extinguishers in all buildings and stores
xi. Designation and proper signage of fire assembly points
xii. Frequent training of farmers on fire safety

Public consultation meetings (focused group)

The following table summarizes the stakeholders consulted and their relevance.

STAKEHOLDER	ROLE
FARMERS/BENEFICIARIES	-OWN THE PROJECT AND PARTICIPATE IN ENSURING THE LITA KUMI INITIATIVE SUCCEEDS -COMPLY WITH THE MINISTRY OF HEALTH GUIDELINES IN CONTAINING THE SPREAD OF COVID-19 DISEASE BY WEARING FACE MASK, KEEPING THE REQUIRED PHYSICAL DISTANCE AND WASHING HANDS AS NECESSARY DURING THE VACCINATION EXERCISE.
MIN. OF INTERIOR AND COORDINATION (CHIEFS)	-PUBLICITY OF THE MAZIWA LITA KUMI PROJECT IN THE COMMUNITY -MONITOR THE VACCINATION EXERCISE
MOH-CG	-IMPLEMENTATION AND MONITORING OF COVID-19 GUIDELINES -SENSITIZING COMMUNITIES ON COVID-19 CONTROL MEASURES
COUNTY TECHNICAL DEPARTMENT OF AGRICULTURE	-PROVIDE TECHNICAL TEAMS TO UNDERTAKE THE MAZIWA LITA KUMI SUPPORT SERVICES -PROVIDE TECHNICAL EXPERTISE -REPORTING ON PROGRESS, COVERAGE, CHALLENGES, AND COPING MECHANISMS OF THE PROJECT -PARTICIPATE IN MONITORING
NEMA	-ENVIRONMENTAL SAFETY -SUPERVISE COLLECTION AND SAFE DISPOSAL OF WASTE -REPORTING
COUNTY GOVERNMENT (CHIEF OFFICER)	-RELEASE OFFICERS TO PARTICIPATE IN THE LITA KUMI PROJECT ACTIVITIES -PROVIDE MEANS OF TRANSPORT TO ENHANCE MOBILITY OF OFFICERS DURING THE PROJECT IMPLEMENTATION -PUBLICITY (WARD ADMINISTRATORS) -PARTICIPATE IN MONITORING
KCSAP/ CPCU	-COORDINATION OF THE SUBPROJECT ACTIVITIES -ENSURE SAFEGUARD ISSUES ARE TAKEN CARE OF IN THE IMPLEMENTATION PROCESS -MONITORING THE IMPLEMENTATION PROCESS -REPORTING -UNDERTAKE AN IMPACT ASSESSMENT OF THE SUBPROJECT
SOCIAL SERVICES	-IDENTIFICATION AND COORDINATION OF THE VULNERABLE GROUPS -REGISTRATION OF GROUPS -CAPACITY BUILDING ON GROUP DYNAMICS -MONITORING AND EVALUATION

CHAPTER FIVE
IMPACT IDENTIFICATION AND MITIGATION MEASURES.

5.1. Introduction.

The main objective of this ESMP report is to predict the potential impacts, and assess the magnitude. The impact assessment forms the basis for development of Environmental Management Plan. Environmental impacts could be positive or negative, direct or indirect, local or regional and also reversible or irreversible. This chapter discusses the environmental impacts on the environment during the operation and decommissioning phases of the project. The potential impacts have been identified and their mitigation measures are discussed below.

5.2 Positive Environmental Impacts

5.2.1 Planting of trees in farms

Farmers shall plant trees to act as wind shields, carbon sinks and dust shields. In doing so, a micro climate shall have been created thus further contributing to protection against negative impacts of climate change.

5.2.2 Protection of water resources

Utilization of alternative water resources which include rain harvesting techniques, ponding and recycling are some of the techniques which farmers shall be using, in doing so, water which is commonly shared in the community shall be protected sustainably.

5.2.3 Controlled crop agriculture (smart farms)

Methods of farming to be used by farmers in this project are largely modernized to maximize a smaller space to produce more as opposed to putting large tracts of land under crop and animal agriculture. Large uncontrolled farming entails land clearing while smart farming entails maximization of available space.

5.2.4 Use of renewable Energy

Most operations in the *maziwa lita kumi* initiative will depend on renewable energy. Eg all chilling plants have been fitted with solar power while in the crop gardens compost is used to produce gas to homesteads. This saves the none renewable energy from being strained, eg over relying of Hydro generated electricity.

5.3 Negative environmental Impacts

5.3.1. Increased Waste Generation.

As a result of project activities, waste shall be generated. These shall be stored properly in waste bins before collection for final disposal. These shall be sorted at point of source

Proposed mitigation measures

- Capacity building on safe use and disposal of agro chemical containers
- *Designate a temporary waste storage area within the project sites and provide waste collection pins.*
- *Each project site shall ensure regular collection of wastes to avoid accumulation of waste*
- *Each chilling plant shall contract a NEMA licensed waste handler for collection of wastes for disposal at licensed disposal sites.*
- *Each chilling plant shall ensure all wastes are handled in compliance with the provisions of EMCA, Waste Management Regulations, 2006.*
- *The projects should partner with stockholders on ways to put in place a burning chamber where wastes would be burnt*

5.3.2. Increased Water Demand.

There will be increased demand for the supply of water due to the increase in water usage in each of the project site.

Proposed mitigation measures

- *Make structural provisions within the each project site for rain water harvesting*
- *Installation of low flow flushing systems where applicable*
- *Regular monitoring for timely detection and repair of all leakages*
- *Sensitize residents on water conservation measures*

5.3.3. Increased Energy Demand.

Increase in energy use in each of the project site would mean an increase in the demand for the supply of electricity. Electrical energy shall be used mainly for bulk milk chilling purposes including lighting, motor and conveyor systems, pumping water into reservoirs etc.

Proposed mitigation measures

- *Each of The projects site is designed in such a way that there is maximum use of natural light to avoid electricity use during the day.*
- *Each of the project should be fitted with at least a roof turbine ventilator to ensure fresh air circulation in the rooms*
- *Each project management to fit day light sensor lights in their building and Sensitize workers on methods of energy conservation.*

5.3.4. Increased Effluent Generation.

Waste water generated from each of the project will mainly originate from daily cleaning of the premises and project site which shall be directed to appropriate technologies in each facility.

Proposed mitigation measures.

- *Effluent waste shall be connected to the existing septic tank.*
- *Regular inspection and maintenance of the effluent management system*

5.3.5. Increased Surface Runoff.

The paved surfaces prevent precipitation from naturally sipping into the ground. Instead, water runs rapidly into storm drainages.

Proposed mitigation measures

- *Incorporate rain water harvesting system in the designs of the proposed project.*
- *Ensure proper storm water drainage system is in place.*
- *Regular cleaning of the storm water drainage system.*

5.3.6. Risks of Fire Outbreaks.

Fires may occur from poor handling of electrical appliances or carelessness in handling other fire sources.

The risk extends to the handling of dry fodder in the farms; probable fire sources should be identified

Proposed mitigation measures

- *Each cooperative and farmer shall provide adequate firefighting equipment within project site.*
- *Sensitize the employees on prevention of fire accidents.*

5.3.7 Risk of biogas Gas leakages

The use of biogas in the homesteads by farmers may pose a risk if the facility is not checked regularly for any leakages. Gas explosions are dangerous to life and property as its fire is airborne and hard to control.

Proposed mitigation measures.

- *Regular checks and repairs of any gas leakage by a trained biogas technicians*
- *Each farmer shall provide adequate firefighting equipment within each facility.*
- *Sensitize the employees on prevention of fire accidents.*

5.3.8 Risk in missuse of agro chemicals and pesticides

The farmers will be using largely modern responses in pests and diseases, this include use of agro chemicals which if properly used will prevent injuries to human, animals and aquatics by extension.

Proposed mitigation measures

- *Proper use and handling of agro chemicals by following data sheet guidelines*
- *Regular and proper use of appropriate PPEs*
- *Full time surveillance and record keeping of all agro chemicals used on farms*
- *Timely capacity building for farmers on use and handling of agro chemicals.*
- *Full compliance of Integrated Pest Management regulation (IPM)*

5.3.9 Increased traffic

In the process of delivering milk and transportation of such other materials and operation in the chilling plants, huge traffic which may result to snarl up may offset more dust and fumes affecting the environment. Mitigation measures shall include:

- Use adequate signage and impose appropriate maximum speeds limits
- Designate a route for vehicles entering each chilling plant delivering milk on a daily basis.

5.3.10 Risk of invasive species

Farmers in this project shall be engaged in planting different kinds of fodder including food crops to sustain their food needs, some seeds planted may be having alien and invasive plants which extra care should be taken including:

- Farmers should work closely with KCSAP officials before introducing new species of fodder and crops as some may be invasive weeds
- Report any unknown plant or seeds seen in the farms to KCSAP offices as soon as possible

5.3.11 Creation of habitats for disease vectors

In the event of harvesting and storing of produces, including storage of hay, water harvesting mechanisms like ponding may lead to creation of conducive habitats for disease vectors and rodents, control will include:

- Such areas like fodder storage, material stores and over grown fodder in the farms should be regularly checked so as the don't form habitats of dangerous vectors.
- Stagnating water and mashes around farmer compound should be eliminated through proper drainage

5.3.12 Salinization and Leaching

Farm operations will include water storage techniques like ponding while some of the crop production techniques will include various types of irrigation, this may lead to leaching which mitigation measures should include:

- Avoid water logged conditions, where possible
- Add humus and organic manure to the soils regularly

5.4 Positive Social Impacts of the projects

5.4.1 Provision of Business Opportunities.

During the Operation Phases of the project there is likely to develop of a number of shopping facilities at the project site, thereby further stimulating the local economy. Good market will come up in the area to cater the demand of the community.

5.4.2. Creation of Jobs.

During the operational phase of the projects, skilled and non-skilled jobs will be created. These jobs will be taken up by both genders without discrimination. The economic ripple effect of these projects to the community at large is highly anticipated.

5.4.3 Improved Security

Construction of proposed project shall enhance security of the respective area through street lighting and presence of security guards.

5.4.4 Improved standards of living of farmers

The enabling of milk chilling plant operation will lead to high profits realized by each farmer group; this will result in improved standards of living among the households and the community at large. This will be through:

i. Better prices for dairy and farm produce
ii. Use of biogas and solar to subsidize energy needs per household conserves nonrenewable energy use and strain on environmental sensitive resources.
iii. Use of farm yard manure in gardens to improve soil fertility
iv. Proper intensive dairy production methods with adequate fodder storage leads to high yields and production, thus improving economic gains
v. Reduced incidences of wide spread animals diseases owing to good animal husbandry and immunization programs through the organized farmer groups.

5.4.5 Recovery of Construction Materials in case of decommissioning.

During decommissioning, re-usable and recyclable construction materials will be recovered. These can be used in other constructions and thus reduce the pressure on environmental resources.

5.4.6 Rehabilitation of environment.

Proper restoration of the environment through maintenance and management could improve the environment. This will include replacement of topsoil and re-vegetation which will lead to improved visual quality of the area.

5.5 Negative Social Impacts of the project

5.5.1. Air Pollution.

During some of the farm operation and may be decommissioning activities may generate emission of fugitive dust. Sources of air pollution include exhaust from diesel engines and equipment, vehicles and dust from demolition structure.

Proposed mitigation measures.

- *The contractor shall provide all the workers with proper Personal Protective Equipment.*
- *Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and watering the site and exposed soils*
- *All machinery generating emissions must be regularly serviced and maintained such that their emissions are acceptable.*
- *Control vehicle speed limits to minimize dust generation.*
- *Sprinkle traffic routes with water regularly.*

5.5.2. Occupational Health and Safety Concerns.

Operation activities will expose workers and the public to various occupational health and safety hazards. They include slippery floors, rotating machines, falls from height, injury from falling materials and uncontrolled collapse.

Proposed mitigation measures.

- *The proponent and contractor shall provide workers with PPEs.*
- *The proponent and contractor shall train all the workers before the commencement of demolition activities on how to prevent accidents.*
- *The proponent and contractor shall provide a first aid kit on site.*
- *Provide a public notice on the ongoing works.*
- *Each project site shall be fenced and the gates manned at all times to prevent unauthorized entry to the site.*
- Follow all the OHS policies and guidelines

5.5.3 *GBV, HIV/AIDs and STDs*

There was a concern of moral decay in the society that would arise from sexual relationships between residents and workers leading cases of GBV and increased transmission of HIV/AIDs and STDs.

Mitigation measures

- Sensitization of the workers to adhere to work ethics and awareness creation at the community level on safe sex.
- Establishment of a grievance redress mechanism to handle cases of GBV alongside other conflicts.
- Collaborating with other entities to put up a VCT centers

5.5.4 Socio Economic impacts

The influx of people into the working areas may further complicate social norms in the receiving community, to mitigate this, the proponent should:

- The contractor shall ensure that there is adequate street lighting within the site
- It is recommended that the proponent employs workers from the immediate area to avoid social conflict
- Sensitize workers on good behavior and the need to co-exist with the neighbors;
- The proponent shall Employ security personnel to protect proponents assets as well as the staff on the premises
- Workers not from area will be sensitized to respect and obey the local customs and social norms of the area
- Establish a code of conduct for the workers

CHAPTER SIX:
RISK ASSESSMENT IN THE CONSTRUCTION, OPERATION AND DECOMISIONING PHASES

6.1 Planning the Work.

A good plan should be made by gathering as much information about the project and the project site before works begin to ensure safety during construction. Information that could be sought includes the following:

- Presence of live bare electrical conductors, underground/overhead insulated cables.
- Ground conditions.
- Nearby schools, footpaths and roads.

6.2 Facilities to be Provided.

6.2.1.1Site Access.

Adequate and safe means of access to and from the site should be provided; signage should also be placed to guide all visitors and workers appropriately.

6.2.2 Site Boundaries.

Scaffold all the construction sites to prevent entry of unauthorized persons especially into sensitive operation areas. Visitors should only be granted access to certain areas when authorized and provided with appropriate protective equipment.

6.2.3 Daily Housekeeping.

Proper daily housekeeping prevents accidents and fires, as well as creates an organized and secure workplace atmosphere.

- All materials shall be stored in suitable manner so that they will not be subject to falling, shifting, or spilling.
- Rubbish, scraps, and debris will be removed from the work area regularly
- Materials will not be left in walkways or outside the work area.

6.2.4. Storage Areas.

- Set up storage areas for materials, flammable substances and hazardous substances
- Store flammable materials away from other materials and protected from accidental ignition.
- Prevent obstruction of access routes/emergency exits by proper storage of materials.
- Materials to be properly stacked to avoid falls.
- Provide fire assembly fire point

6.1.3. Site traffic access

- Provide safe site entry and exit points with adequate turning space and good visibility for vehicle drivers.
- Keep pedestrians separate from vehicles, e.g., by providing separate site entry and exit points.
- Consider a one-way system and avoid needs for vehicles to reverse wherever possible
- Consider fitting reversing alarms to vehicles.
- Make sure that vehicles are not overloaded
- Make sure loads are securely attached to vehicles and that loose materials cannot fall from lorries
- Provide proper signage for people able differently (PADs)

6.1.4. Welfare

1. Drinking water

Adequate supply of wholesome drinking water shall be provided at suitable points conveniently accessible to all workers.

2. Lighting

All parts of each of the sites need to be properly lit by natural or artificial means whenever work is going on. Site lighting is always necessary in those areas which lack natural light.

3. Sanitary facilities

Sufficient and suitable sanitary conveniences for the workers shall be provided, maintained and kept clean. The number of toilets required will depend on the number of workers on every chilling plant. Adequate washing facilities should be provided as near as practicable to toilet facilities.

6.1.5. Emergency Response Plan (ERP).

The purpose of the Emergency Response Plan is to develop a plan to manage emergencies with regard to the project and provide channels for communication if an emergency occurs.

Every chilling plant must have an emergency response plan which should include the evacuation plan, technical means/equipment necessary for handling small-scale emergency situations, protective and communication means for personnel to protect themselves and call for corresponding emergency services such as fire-fighting, ambulance etc.

Every accident will be registered and its causes will be investigated. If necessary, remediation will be ensured.

Each chilling plant shall train and provide a fully equipped first aid kit and firefighting equipment.

All site workers must be trained on site-specific emergency procedures.

This training shall include the following:

- Alarms and other emergency communications used on the site.
- Emergency escape procedures
- Evacuation procedures including routes and assembly areas to be used.
- Initial emergency response actions
- Location of first-aid kits and identification of first-aid providers.
- Location of firefighting equipment and how to use them.
- Equipment operation procedures prior to evacuation
- Procedures to account for all employees
- Signage for escape roots

6.1.5.1. Fire Prevention and Firefighting.

Fires on construction sites arise from the misuse of compressed gases and highly flammable liquids, from the ignition of waste material, wood shavings and cellular plastic materials, and from the failure to recognize that adhesives and some floor and wall coatings are highly flammable.

- Every individual on site should be aware of the fire risk, and should know the precautions to prevent a fire and the action to be taken if fire does break out, this will be possible through a regular training on the same.
- The contractor shall ensure no obstruction of any kind to access each project site in case of fire.
- The site shall have adequate means of escape, in case of fire as per OSHA guidelines
- Fire drills and capacity building should be contacted regularly.
- A fire risk assessment should be done regularly especially in the dry fodder storage area and the biogas facilities

6.1.5.2. Risk in handling agro chemicals and pesticides

The modernized technology to be used by the farmers may pose a challenge on environment especially if the chemicals and pesticide are not used properly, a mitigation plan for this will include:

i. Strict adherence to manufactures guidelines on use of such chemicals
ii. Proper and full time use of PPEs whenever handling of such chemicals is required
iii. Proper disposal of agro chemical containers in approved disposal site
iv. Capacity building i.e IAK

6.1.5.3. Other Possible Causes of Accidents.

Potential hazards for workers in construction include:

- Electric shock
- Operation equipment.
- Injuries from falling material.
- Failure to use proper personal protective equipment

6.1.5.4. Personal Protective Equipment's (PPEs).

Safety in all project sites should be enhanced and all workers and employees should be encouraged to at all times protect themselves from injuries and accidences by wearing appropriate Personal Protective Equipment's (PPEs), such as a helmet, hearing and eye protection, boots and gloves.

Hand and skin protection

Hands are extremely vulnerable to accidental injury. Open wounds, abrasions, fractures, dislocations, strains, amputations and burns occur. They are largely preventable by better manual handling techniques and equipment, and by wearing suitable hand protection such as protective gloves.

Head protection

Workers shall wear helmets where there is a potential for objects falling from above, bumps to their heads from fixed objects, or of accidental head contact with electrical hazards.

Foot protection

Foot injuries fall can be due to penetration of the sole by nails which have not been knocked down or removed, or due to falling materials, which can be minimized by wearing protective footwear.

6.1.5.5. First Aid.

Factories (First-Aid) Order section 50(1) of the Act requires the occupier to provide the first-aid boxes or cupboards at a work place which are adequate and appropriate equipment, facilities and personnel to enable first aid to be given to the Employees if they are injured or become ill at work.

The minimum provision for all sites is:

- A first aid box with enough supplies to cope with the number of workers on site should be put in place as per the order
- A trained person should take charge of all first-aid arrangements;
- Clearly place the names and contacts of first aider and all other emergency services on a notice board accessible to all.

6.1.6 Notice of Accidents and Dangerous Occurrences.

The OSHA Act, 2007 requires an employer or self-employed person shall notify the area occupational safety and health officer of any accident, dangerous occurrence, or occupational poisoning which has occurred at a workplace as follows:

- Where an accident in a workplace, causes the death of a person therein, within twenty-four hours of the occurrence of the accident
- Where an accident in a workplace causes non-fatal injuries to a person within seven days of the occurrence of the accident.

CHAPTER SEVEN

7.0 INTERGRATED PEST MANAGEMENT PLAN (IPM) FOR THE OPERATION MAZIWA LITA KUMI SUB PROJECT

There are many different definitions that have been fronted over the years to describe Integrated Pest Management (IPM). In 1967, FAO defined IPM as "a pest management system that in the context of the associated environment and the population dynamics of the pest species, utilizes all suitable techniques and methods in as compatible manner as possible, and maintains the pest population at levels below those causing economic injury".

7.1 Pre-conditions of IPM

The IPM approach is recommended for pest management and it requires the following key preconditions/principles before implementation:

- ✓ Understanding ecological relationships within a farming system (crop/plant, animals, pests organisms and factors influencing their development).
- ✓ Understanding economic factors within a production system (infestation: loss ratio, market potential and product prices).
- ✓ Understanding socio-cultural decision-making behavior of the farmers (traditional preferences, risk behavior).
- ✓ Involvement of the farmers in the analysis of the pest problems and their management.
- ✓ Successive creation of a legislative and agricultural policy framework conducive to a sustainable IPM strategy (plant/animal quarantine legislation, pesticides legislation, pesticide registration, price policy).

7.2 Elements of IPM

The key elements of an IPM program are:

- ✓ Use of available, suitable, and compatible methods which includes resistant varieties, cultural methods (planting time, intercropping and crop rotation), biological control, safe pesticides to maintain pests below levels that cause economic damage and loss
- ✓ Use of available, suitable, and compatible methods which includes cultural methods, resistant animals, biological control, safe natural and synthetic pesticides to maintain pests and diseases below levels that cause economic damage and loss of livestock Conservation of the ecosystem to enhance and support natural enemies and pollinators
- ✓ Integrating the pest management strategies in the agro ecosystems
- ✓ Pests and crop and livestock loss assessments

7.2.1 Pest management approaches in Operation Maziwa Lita Kumi Initiative sub project

Noting that IPM relies on several pest management options, the current status in the utilization of IPM in the project area is unknown. However, farmers in the community employ one or several options to manage pests though in uncoordinated manner that does not consider the principles of IPM. In such a case, it would be wise to indicate that there is potential in the target irrigation to adopt IPM as a first choice in the management of pest problems. This would require capacity building for farmers and other stakeholders in understanding IPM and its implementation, as well as market support that would indicate farmers practicing IPM are likely to get premium prices for their commodities.

The key options that were considered producing the IPM package included:

1. Cultural practices
2. Physical means
3. Mechanical means
4. Judicious use of pesticides
5. Biological control
6. Use of pheromones
7. Use of semi chemicals

8. Use of growth regulators
9. Botanical pesticides
10. Host plant resistance

These strategies are proposed for management of the pest problems on crops in the Table below. For these to be effective in an IPM package, pest managers have to adopt the following elements:

1. Pest identification
2. Natural enemies; identification, population levels
3. Pest sampling
4. Pest scouting
5. Understand damage levels (economic damage)
6. Cost benefit assessment of intended management option
7. Monitoring
8. Surveillance
9. forecasting

Fig. 4 INTERGRATED PEST MANAGEMENT PLAN (IPM) FOR MAZIWA LITA KUMI INITIATIVE

CROP	PEST PROBLEM /DISEASES	PROBLEM STATUS	PEST MANAGEMENT STRATEGIES
Maize	Stalk borers Main: Busseola fusca, Chilo partellus Others: C. orichalcociliella, Sesamia calamistis, Eldana saccharina	Anticipated high risk	· Bury/burn stalks to eliminate diapausing larvae, · Early sowing to reduce infestation, · Intercropping with pulses, · Neem(mwarobaini) powder (4-5g i.e. pinch of 3 fingers) per funnel, · Neem seed cake (4g/hole) during planting
	African armyworm (Spodoptera exempta)	Anticipated high risk	· Scout the crop immediately the forecast warns of expected outbreak in the area · Bt products
	Storage pests (Larger grain borer (Prostephanus truncatus) Maize weevil (Sitophilus zeamais) Moths (Sitotroga cereallela, Ephestia cautella) Red flour beetle (Tribolium caestaneum) Dried bean beetles (Acanthoscelides obtectus	Current	· Selection of tolerant varieties, · Timely harvest, · Dehusking and shelling, Proper drying, · Sorting and cleaning of the produce, · Cleaning & repair of the storage facilities, · Use rodent guards in areas with rat problems, · Use improved granaries, · Keep the grain in air tight containers and store these in a shady place, preferably in-doors, · Carry out regular inspection of the store and produce. · Timely detection of any damage to the grain and/or storage structure is essential to minimize potential loss or damage,
	Grey leaf spots (GLS), Cercospora zeae-maydis	Current anticipated high risk	· Crop rotation, · Observe recommended time of planting · Removal of infected plant debris by deep ploughing
	Maize streak virus	Current, anticipated high risk	· Early planting, · Plant recommended resistant varieties e.g. TMV-1 in areas · below 1500m above sea level, Katumani ST

	Northern leaf blight (Exserohilum turcicum)	Current, anticipated high risk	· Rotation, · Deep plough of the crop residues, · Plant recommended resistant varieties e.g. H6302, UH6010, TMV-2, H614
	Leaf rust (Puccinia sorghi	Current, anticipated high risk	· Timely planting, · Crop rotation, · Clean seeds, · Reduce density, · Allow adequate aeration
	Common smut (Ustilago maydis)	Current, anticipated high risk	· Clean seeds, · Crop rotation, · Removal of plant debris by deep ploughing
	Weeds: broad leaved and	current	· Crop rotation · Proper land preparation, · Timely weeding (at 2 and 5 weeks after planting), · Recommended herbicides, · Hand pulling and hoe weeding, · Intercropping, · Use resistant/tolerant varieties · Improvement of soil fertility
	Vertebrates (Baboons, Monkeys, Wild pigs, Warthog, Birds, Rats, Hippopotamus, elephants	Current and anticipated	· Farming in block, · Cultivate crops that are not preferred by the prevalent vermin · Local scaring
Millet	Shootfly (Atherigoma soccata	Current, anticipated high risk	· Observe recommended time of planting to avoid the pest · Plant recommended varieties, · Destroy infected crop residues by burying, · Apply recommended insecticides if necessary e.g. endosulfan or fenitrothion
	Stalk borers (Busseola fusca & Chilo partellus)	Current, anticipated high risk	· As in maize
	African armyworm ((Spodoptera exempta)	Current,	· As in maize

		anticipated high risk	
	Rust (Puccinia penniseti)	Current, anticipated high risk	· Observe recommended time of planting · Field sanitation · Plant recommended tolerant varieties if available
	Smut (Moesziomyce bullatus)	Current, anticipated high risk	· Plant resistant varieties
	Downy mildew (Sclerospora graminicola)	Current, anticipated high risk	· Early sowing · Use of disease free seed · Transplanting the crop suffers less from the disease · Roughing of infected plants to avoid secondary infection
	Quelea quelea spp	Current, anticipated high risk	· Scaring, Bird trapping, · Farmers to scout potential breeding sites and destroy nests, · Monitoring and organized aerial spraying using fenthion 60%ULV at the rate of 2.0l/ha · Spot spraying, targeting roosting sites
	Banana weevil (Cosmopolites sordidus	current	· Practice crop rotation · Intercropping with legume which reduce weevil movement · Sanitation/crop hygiene, · Use healthy planting material (use a combination of corm paring and hot water (at 550C for 20 minutes or solarisation) treatment, · Sequential planting to avoid nematode infested areas · Rational use of weevil trapping with bait (split pseudostems · or discs and corns), · Use of repellent botanicals, such as Tephrosia, tobacco, · Mexican marigold, Neem, · Improved soil fertility management and crop husbandry, · Mulching, · Deep planting to discourage egg-laying · Harvest hygiene

	Panama disease or Fusarium wilt (Fusarium oxysporum f.sp. cubense)	Current, anticipated high risk	· Grow banana cultivars with resistance to pest and disease · Fallow or rotation · Sanitation/crop hygiene, Planting of clean suckers · Establish new crop on disease free sites · Mulching, Application of high quantities of manure · Destroy debris of wilted plants by burning
	Black and yellow sigatoka (Mycosphaerella fijiensis)	Current, anticipated high risk	· Resistant cultivars · Uproot and burn the affected parts · Use of large quantities of farmyard manure · Plant and field sanitation, · Use disease free seeds · Prune, remove suckers and weed frequently · Avoid close spacing, · Avoid transfer of seeds from affected areas to unaffected areas
	Nematodes, (Pratylenchus goodeyi, Radophilus similis	Current, anticipated high risk	· Improved farm management, including sequential replanting and soil fertility · Practice crop rotation · Sanitation/crop hygiene · Farmer training in disease identification and control measures · Use healthy planting material · Establish new crop on disease free sites · Mulching to enhance beneficial soil organisms to suppress nematodes · Treatment of infested suckers with hot water · Application of high quantities of manure · Sterilise planting material through solarization and/or the hot water method as for weevil control
Beans (most cereals)	Bean stem maggot (Ophiomyia spp)	Current, anticipated high risk	· Observe recommended time of planting · Apply manure/fertilizers, · Practice hilling/earthing up when weeding, · Using of resistant varieties · Use certified seeds; seed dressing
	Bean aphids (Aphis fabae)	Current, anticipated high risk	· Promote build up of indigenous natural enemies, · Observe recommended time of planting, · Apply wood ash in case of a heavy attack, · Carry our regular crop inspection to detect early attacks, · Apply recommended insecticide when necessary

	Bean leaf beetle (Ootheca benningseni)	Current, anticipated high risk	· Practice good crop rotation, · Observe recommended time of planting
	Bean bruchids (Acanthoscelides obtectus)	Current	· Early harvesting and good drying of the beans, · Ensure the beans are dry and well cleaned before storage, · Apply recommended storage insecticide/ botanical extracts, · Storage in airtight containers, Vegetable oil seed coating
	Angular leaf spot (Phaeoisariopsis griseola	Current, anticipated high risk	· Practice good crop rotation, · Use of healthy and clean seeds; Use certified seeds, · Post-harvest tillage, · Removal/burning of infected crop residues · Plant tolerant/resistant varieties
	Anthracnose (Colletotrichum lindemuthiamum)	Current	· Use of resistance varieties, · Use of healthy seeds, · Crop rotation · Seed dressing, · Post harvest tillage · Field sanitation
	Bean pod borer (Helicoverpa armigera	Current, anticipated high risk	· Apply recommended insecticides or botanical extracts
	Rust (Uromyces appendiculatus)	Current, anticipated high risk	· Avoid planting beans in high altitude areas, · Practice good crop rotation, Sanitation and crop hygiene, · Plant tolerant/resistant varieties, · Observe recommended time of planting, · Spray with recommended fungicide when necessary
Irish, sweet etc potatoes	potato weevil (Cylas Spp)	Current, anticipated high risk	· Sanitation, · Use of clean materials, · Crop rotation, · Plant varieties that form tubers at a greater depth, · Early harvesting of tubers; as soon as weevil damage is observed on tuber tips, harvesting should begin, · Keeping distance (at least 500m) between successive sweet potatoes plots, · Destroy infected crop residues by burying,

			▪ Planting of repellent species, such as Tephrosia, tobacco and Mexican, ▪ Hilling up twice (at 4th and 8th week after planting) in the season to cover soil cracks and exposed to minimize egg slaying, ▪ Traps with pheromones
	Striped sweet potato weevil (Alcidodes dentipes	Current, anticipated high risk	▪ Sanitation, ▪ Use of clean materials, ▪ Crop rotation, ▪ Plant varieties that form tubers at a greater depth, ▪ Early harvesting of tubers; as soon as weevil damage is observed on tuber tips, harvesting should begin
	Sweet potato feathery mottle virus (SPFMV)	Current, anticipated high risk	▪ Use of resistant varieties, ▪ Crop rotation, ▪ Field sanitation ▪ Management of vectors
	Mole rats (Tachyoryctes splendens)	Current, anticipated high risk	▪ Planting of repellent species, such as Tephrosia, tobacco, onion, garlic and Mexican marigold in the field and its boundaries, ▪ Insert parts of repellent plant species into tunnels
Tomato	American bollworm (Helicoverpa armigera)	Current, anticipated high risk	▪ Destroy infected crop residues and fruit after harvesting, ▪ Encourage natural enemies (parasites, ants, Anghocoridbugs and egg predators), Use maize as a trap crop (timing of crop stage; tasseling ▪ stage coincides with attack), ▪ Inspect the crop regularly for new infestations, Use botanicals like Neem extract, ▪ Apply recommended insecticides at recommended dosage rate
	Cutworms (Agrotis spp)	Current	▪ Early ploughing to expose cutworms to predators, ▪ Apply wood ash around plants, ▪ Inspect the crop regularly soon after transplanting because this is the most susceptible stage of the crop, ▪ Mechanical (hand collect and crush them), crush the caterpillars or feed them to chicken, ▪ Use repellent botanicals, ▪ Spray with recommended insecticide if necessary
	Root knot nematodes (Meloidogyne sp)	Current, anticipated high	▪ Optima rotation and fallow, Deep ploughing, ▪ Avoid contaminated water, ▪ Plant tolerant/resistant varieties,

		risk	· Sterilize the seedbed before sowing, · Avoid planting a new crop on infested areas
	Red spider mites (Tetranychus spp); Tomato Russet mite, Aculops lycopersici	Current, anticipated high risk	· rogue infected plants, · Avoid dusty conditions during extreme dry season, · Encourage moist microclimate by frequent irrigation, · Hedge planting to reduce dust, invasion by mites blown by wind, · Encourage natural enemies by mulching and hedging, · Observe recommended time of planting, · Plant tolerant/ resistant varieties, · Sanitation and crop hygiene, Inspect the crop regularly for new infestations, · Frequent weeding,
Onion	Onion thrips (Thrips tabaci)	Current, anticipated high risk	· Sanitation and crop hygiene · Separate seed bed and field to reduce danger of carrying over thrips from one site to the other, · Crop rotation, Mixed cropping of carrots and onions, · Observe recommended time of planting, · Transplant clean seedlings, Mulching reduces thrips infestation considerably, Plough deep after the harvest to bury the pupae Irrigation/adequate watering, · Enhance beneficial (predatory mits, bugs, fungal pathogens like Metarhizium)
	Downy mildew (Peronospora destructor	Current	· Use resistant varieties (red creole) and crop rotation for atleast five years, · Sanitation: remove crop remains after harvest, do no leave volunteer plants in the field and avoid over fertilization, · Wide spacing and good drainage to decrease humidity in the plant stand, · Apply mulch to avoid rain splash, Inspect the crop regularly
	Purple blotch (Alternaria porri	Current, anticipated high risk	· Sanitation: remove crop remains after harvest, do not leave volunteer plants in the field, · Crop rotation, · Mulching to avoid rain splash, · Plant at recommended spacing, Inspect the crop regularly, · Apply recommended fungicide at correct dosage
	Storage rots (Bortytis, Erwinia, Mucor, Fusarium)	Current, anticipated high risk	· Use of netted bamboo baskets, · Avoid heaps exceeding 30 cm depth and use racks of 1m high, Ventilated stores, · Minimize damage during handling,

			· Drying of onions before storage, Remove tops, Avoid thick · neck/split
Brassicas eg Cabbages, Kales etc	Diamond back moth (Plutellaxylostella)	Current, anticipated high risk	· Scouting, Use botanical and other control agents, · Observe recommended time of planting Transplant healthy seedlings, · Inspect the crop regularly to detect early attacks, · Encourage natural enemies (predatory hoverfly larvae coccinellids, parasitic wasps) by enhancing diversity, Application of fermented cow urine(10-14days fermentation), Use botanicals (Neem oil, chillies, etc.)
	Aphids (Brevicoryne brassicae) Sawflies Cabbage web worms	Current, anticipated high risk	· Natural enemies include parasitic wasps (e.g., Diaeretiella rapae), ladybirds, hoverflies, lacewings, a range of predatory flies, spiders, and insect-pathogenic fungi. Providing habitats that encourage the presence of these may help control aphid numbers. They may not be effective in preventing virus transmission, as this can occur even at low aphid densities. · Use of Bio pesticides.
	Black rot (Xanthomonas campestris)	Current, anticipated high risk	· Seed dressing with Bacillus bacteria, Seed treatment with hot water,Mulching,Deepploughing,3-yearcroprotation, · Field and crop hygiene, Transplant only healthy seedlings, · Plant certified seeds, Plant tolerant/resistant varieties like Glory, Amigo FI, Sterilise the seed bed before sowing, · Good drainage, and mulch to avoid infections from rain splash
	Downy mildew (Peronospora destructor)	Current, anticipated high risk	· Practice good crop rotation, Observe recommended time of planting, Transplant only healthy seedlings, Plant at recommended spacing
	Alternaria leaf spot (Alternatira spp)		· Control of Alternaria leaf spot on cabbage heads in the field is necessary for long-term storage. · Avoid overhead irrigation, · Practice good crop rotation · Observe recommended time of planting, · Transplant only healthy seedlings, Plant at recommended spacing
	Cabbage club rot (Plasmodiaphorabrassicae		· Always use plants that are certified. · Carefully choose sites for crucifer seedbeds that do not have a history of clubroot. · Do not use irrigation water from sources that may be contaminated. Seedbed areas may be fumigated with appropriate fumigants; infested

			field soil pH should be adjusted to pH 6.8 with ground limestone (CaC03); always thoroughly clean farm equipment after working in a field suspected of having the clubroot fungus; a rotation of at least 7 years out of susceptible crucifers may be effective; ▪ Plant resistant varieties
	Cauliflower mosaic Virus (CaMV)		▪ Remove brassica weeds, ▪ Rogue young plants showing disease symptoms and immediately burns them

CHAPTER EIGHT:
ENVIRONMENTAL MITIGATION MEASURES AND ENVIRONMENTAL SOCIAL MANAGEMENT PLANS (ESMP).

8.1. Introduction.

Environmental Social Management Plan is aimed at ensuring that the identified impacts of the proposed project are contained and brought to acceptable minimum levels during all phases. An environmental Social management plan has been developed to assist the proponent in mitigating and managing environmental impacts associated with the life cycle of the proposed project. The objectives of the Environmental Social Management Plan are:-

- To guide the project proponent in project planning.
- To guide the project proponent on the likely impacts of the project and when they are likely to occur.
- To give an assessment of the capacity requirements for the implementation of the ESMP.
- To guide the project proponent to allocate adequate resources for the implementation of the proposed mitigation measures.

A comprehensive ESMP has been developed. The ESMP assigns responsibility and gives costs estimates for implementing the proposed mitigation measures.

8.2. Monitoring and Evaluation (M & E).

Compliance environmental monitoring is required during all the phases of the proposed project (construction, operation and decommissioning). Accordingly, a compliance monitoring plan is included in this ESMP. The parameters to be monitored will help to provide information on the quality of the environment as the project progresses.

10.3. PROPOSED ENVIRONMENTAL AND SOCIAL MANAGEMENT & MONITORING PLAN (ESM & MP) FOR OPERATION MAZIWA LITA KUMI SUB PROJECT.

Fig. 5

Environmental Impact	Proposed mitigation measures	Responsibility	Indicator	Time frame	means of verification	cost estimates
ENVIRONMENTAL AND SOCIAL IMPACTS DURING OPERATION						
Air Pollution	Frequent watering of access roads to suppress and prevent fugitive dust generation in all sites Maintenance of effective exhaust systems on all vehicles especially those delivering milk through the project life. Watering of exposed soil areas during the dry seasons Daily cleaning of equipment's to remove any accumulation of loose materials and other debris Workers must be provided with personal protective equipment at all times. Each of the sites should have a perimeter fence.	Contractor and each project management	-Level of dust seen -Number of complaints recorded on dust emission -Number of bumps erected to reduce speed -Frequency of vehicle/ machine servicing	Throughout the operation period	-Records of quantity of water sprinkled and vehicle servicing. -Complaints register -Availability of speed pumps and signage	100,000
Increased traffic	Use adequate signage and impose appropriate maximum speeds limits Designate a route for vehicles entering each chilling plant delivering milk on a daily basis.	Each project management teams	-Level of traffic within the sub project -Availability of signage's	Through each operation period	-Vehicle movements and material delivery records maintained -Registers	80,000
Noise and excessive vibration	To minimize impacts of noise generation from operation activities, the workers will be provided with PPEs including ear muffs and other protection devices. Engines shall be turned off when not in use or standstill like those vehicles delivering milk	Contractor and the management of each project	-Level of noise within the sub project	Project life	-Attendance lists of sensitization forums held - SOPs	50,000

	Delivery of any goods in any of the sites should only be during the day 08 AM to 05.00 PM		-Quantity of PPEs provided - Number of equipment's fitted with silencers		-Delivery books	
Soil erosion	Stabilize exposed areas susceptible to erosion by planting vegetation Excavation during dry season should be discouraged and proper management of excavated soils be implemented	Each project management and the contractor	-Condition of grounds and notable level of erosion -Types and number of trees planted -Landscaped and revegetated areas.	Through the project cycle	-Record sheet with types and number of trees planted -Delivery books	110,000
Solid waste generation	The proponents shall designate on-site waste storage areas, provide adequate amount of waste storage facilities, and protect stored wastes from potential runoff by rain or wind. It is recommended that, wherever possible, to minimize the production of solid waste, reduce packaging wastes by purchasing materials in greater quantities or purchase materials packaged in reusable or recyclable containers. Prohibit littering by staff and other personnel. Regular collection of wastes for disposal at designated sites Each chilling plant shall contract a NEMA licensed waste handler for proper waste disposal	Each project management teams	-Quantity of solid generated in volumes -Types of waste skips provided -Reduced waste volumes/quantity -Number of litter bins available	Through the project life	-Available waste bins, disposal site and recycle mechanisms in the sub project. -Contract agreements with licensed waste collectors	100,000

	All wastes shall be handled in accordance with the provisions of EMCA, waste Management regulations 2006.					
Effluent generation	Provide adequate sanitary facilities for workers on every project site. Strict management of effluent especially from the intensive dairy production units capturing and re-using surface runoff in retention ponds Effective use of animal wastes to generate bio gas Adequately dig up appropriate drainages in each chilling plants as per the approved designs	Contractor and each project management	-Properly installed drainage system and effluent management systems available -Number of times the septic tank is exhausted	Records	-Records of exhauster services offered -Contract agreements for repairs done	70,000
Increased water demand	Sensitize the workers on water conservation measures such as ensuring taps are not running when not being used. Install auto shut taps to all water points to conserve water resource Harvest all rain water and store for use during dry seasons Recycle, re use and reduce water demand by recording water uses in each facility Construct in farm water retention ponds and where possible water pans where surface run off would be harvested and stored for use in dry seasons	Each project management and the County through the KCSAP	-Volume of water consumption within the sub project - Auto shut taps installed - Sensitization of water conservation	Record of each site	Water bills available	150,000
Occupation health and safety	Provision of clean drinking water, adequate toilet facilities, solid waste disposal system. Provision of Personal Protective Equipment (PPEs) to all workers Guarding of dangerous machine parts and maintenance of equipment Adequate provision of firefighting equipment Provision of a first aid kit on every Chilling plant site	Project management	-Level of use and adoption of OHS -Number of accident and incidents cases recorded.	Through the project life	-Accident statistics -Incident occurrence reports	50,000

	All applicable laws and regulations pertaining to health and welfare at the workplace of the people should be adhered to. Observe all the COVID 19 ministry of health regulations during the entire lifespan of the project or unless otherwise advised by MOH					
Socio economic impacts	The contractor shall ensure that there is adequate street lighting within the site It is recommended that the proponent employs workers from the immediate area to avoid social conflict Sensitize workers on good behavior and the need to co-exist with the neighbors; The proponent shall Employ security personnel to protect proponents assets as well as the staff on the premises Sensitize workers on prevention of STDs, HIV and Voluntary Counseling and Testing. Workers not from area will be sensitized to respect and obey the local customs and social norms of the area Establish a code of conduct for the workers	Project management	Number of street/security lights installed -number of security personalle employed per site	Project records	-Procurement records -employment records of security -attendance sheets for workers sensitization meetings	30,000
Increase waste generation	Designate a temporary waste storage area within each of the project site and provide waste collection pins. Each of the proponent shall ensure regular collection of wastes to avoid accumulation of waste Each chilling plant shall contract a NEMA licensed waste handler for collection of wastes for disposal at licensed disposal sites. Each farmer and chilling plant shall ensure all wastes are handled in compliance with the provisions of EMCA, Waste Management Regulations, 2006.	Each proponent	-Number of litter bins available -Availability of contract agreement with licensed waste collectors -Number of sessions on awareness done on proper solid	Records through the project life	-Collection schedules -Contract agreements with licensed waste collectors -Attendance lists	120,000

			waste disposal			
Risk of Gas leakages	-Regular checks and repairs of any gas leakage by a trained biogas technicians -Each farmer shall provide adequate firefighting equipment within each facility. -Sensitize the employees on prevention of fire accidents.	Each proponent in each project site	Number of biogas plants constructed	Incident Records through the project life	Records from technicians showing number of repairs done	90,000
Increased energy demand	Each chilling plant should be designed in such a way that natural light and air will be enhanced to avoid electricity lighting during the day. All buildings in each chilling plant will be energy efficient through use of low energy conserving fixtures. Sensitize each farmer and chilling plant managements on methods of energy conservation Installation of solar panels in all chilling plants to reduce strain on nonrenewable energy	Each project management	Number of transparent lighting installed in the plants Number of solar panels installed	Project life	-electric bills showing reduction in energy consumption -Procurement records of solar panels with inventory record	100,000
Risk in miss use of agro chemicals	-Proper use and handling of agro chemicals by following data sheet guidelines provided -Regular and proper use of appropriate PPEs -Full time surveillance and record keeping of all agro chemicals used on farms -Timely capacity building for farmers on use and handling of agro chemicals. -Full compliance of Integrated Pest Management regulation (IPM)	Each FCS	Surveillance records of use of agro chemicals - number of capacity buildings organized with farmers -	Project life	-attendance sheets for capacity building meetings -procurement and inventory records of PPEs	90,000
Increased GBV, HIV and STDs prevalence	-Sensitization of the workers to adhere to work ethics and awareness creation at the community level on safe sex. -Establishment of a grievance redress mechanism to handle cases of GBV alongside other conflicts.	Each project management	• Number of sensitizations on GBV and STDs/HIV • Presence of plans for	Project life	Occurrence Registers	75,000

	-Collaborating with other entities to put up a VCT centers		reducing GBV risks Established referral mechanism on GBV			
Risk of fire outbreaks	The farmer and chilling plant shall provide adequate firefighting equipment within each project sites. Sensitize the all workers on prevention of fire accidents. Do a fire risk assessment in the dry fodder storage area, any possible sources of fire should be eliminated to avert a disaster	Each of the farmer groups	Number of fire extinguishers available -number of trainings on fire safety conducted	Project life	-procurement and inventory records of fire fighting equipment's -attendance sheets and certificates of participation in fire safety trainings	150,000
Risk of invasive Species	Farmers should work closely with KCSAP officials before introducing new species of fodder and crops as some may be invasive weeds	Each of the farmer groups management	Record of types of plants grown in the project area	Project life	-seed procurement records	20,000
Creation of favorable habitats for the growth and proliferation of disease vectors	Such areas like fodder storage, material stores and over grown fodder in the farms should be regularly checked so as the don't form habitats of dangerous vectors. Stagnating water and mashes around farmer compound should be eliminated through proper drainage	Each individual farmer under the project	-Number of fumigations done per single period	Project life	Procurement records for fumigants -incident records for disease vector presence and actual disease caused	30,000
Employment	-Both skilled and non-skilled labor as much as possible to be accessed locally. -Equal opportunities to gender, youth and People with disabilities.	Each famer group and KCSAP	- No of locals as a proportion of	Project life	-Staff employment records	50,000

	-Engage local stakeholders in such issues		all workers at the site			
Salinization / Leaching	Avoid water logged conditions, where possible -Add humus and organic manure to the soils regularly	Each famer group and KCSAP	Number of farms using humus backed with records	Project life	-procurement and observation records of humus	15,000
SOCIAL AND ENVIRONEMNTAL IMPACTS DURING DECOMISSIONING PHASE						
Environmental Impact	**Proposed mitigation measures**	**Responsibility**	**Indicator**	**Time frame**	**means of verification**	
Generation of demolition waste	The contractor shall ensure that waste is segregated at source and separated in a suitable manner into general, hazardous waste and material which can be recycled/ reused. Wherever possible recycling shall be carried out. The contractor shall designate a waste collection area within the site and provide an adequate number of waste receptacles for waste collection Each site management shall engage a NEMA licensed waste handler for collection and disposal of waste Particular care shall be taken in handling of materials that could be wind-borne or waterborne to ensure that the release of these materials is minimized The contractor shall ensure that no dumping of waste within the surrounding The contractor shall ensure that all waste is disposed off at a licensed site.	Each chilling plant management Contractor	-Number of litter bins available -Availability of contract agreement with licensed waste collectors -Number of sessions on awareness done on proper solid waste disposal	Decommissioning	-Collection schedules -Contract agreements with licensed waste collectors -Attendance lists	100,000
Noise and excessive vibration	The contractor shall ensure that all decommissioning machines are regularly maintained	Contractor	-Level of noise within the sub project	Decommissioning	-Attendance lists of sensitization forums held	80,000

	Demolition activities shall be restricted to day time The contractor shall sensitize the truck drivers on noise reduction		-Quantity of PPEs provided - Number of equipment's fitted with silencers		- SOPs -Delivery books	
Air pollution	The contractor shall provide all the workers with proper Personal Protective Equipment and clothing. Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and watering the site and exposed soils All machinery generating emissions must be regularly serviced and maintained such that their emissions are acceptable. Control vehicle speed limits to minimize dust generation Sprinkle traffic routes with water regularly	Contractor	-Level of dust seen -Number of complaints recorded on dust emission -Number of bumps erected to reduce speed -Frequency of vehicle/ machine servicing	Decommissioning	-Records of quantity of water sprinkled and vehicle servicing. -Complaints register -Availability of speed pumps and signage	70,000
Occupation health and safety concerns	The contractor shall provide workers with PPEs and ensure their use The contractor shall train all the workers before the commencement of demolition activities on how to prevent accidents The contractor shall provide a first aid kit on site. Provide a public notice on the ongoing works Each site shall be fenced and the entry restricted to authorized personnel.	Contractor and each chilling plant management	Sensitizations on OSH conducted -Evidence and number of risk assessments available -First aid kits provided - Signage provided	During decommissioning	-Accident statistics -Incident occurrence reports -Supply records	50,000
Spread of COVID-19	-Electronic means of consulting stakeholders. -Avoid concentrating of more than 15 community members at one location.	Each chilling plant management and Contractor	-Availability of SOP(s), Training material,	During all public participations	SOPs. Training programs, Minutes, POs	65,000

amongst community members during consultations processes	-The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;		PPE, sanitizing facilities -Availability of SOP(s), Training material, PPE, sanitizing facilities -No. of participants registered online.			

8.4 Conclusion

The potential impacts of each of the project on the existing environment of the area were identified and evaluated and the impact assessment was based on the interactions between the project activities and the environmental status and sensitivities of the various ecological components of the project, namely the biophysical, social, and health components.

Mitigation measures for the identified impacts were proposed. These mitigation measures were incorporated into the Environmental Social Management Plan (ESMP), which would ensure the potential adverse impacts and associated impacts of the project on the environment implemented throughout the life of the project.

This report has demonstrated that the overall impacts associated with each chilling plant project can be managed within reasonable and acceptable limits by applying all proposed mitigation measures contained in the ESMP.

In consideration of the above therefore, there is no major environmental issue to impede the operation of all the chilling plants by KCSAP Uasin Gishu coordinating unit. All the identified potential adverse impacts of the proposed project shall be eliminated or reduced through the implementation of the recommended mitigation measures.

The benefits that will be derived from the project are therefore much greater than the short-term environmental effects.

It is concluded that the proposed project will not cause serious damage to the environment if the ESMP is implemented fully.

Recommendation

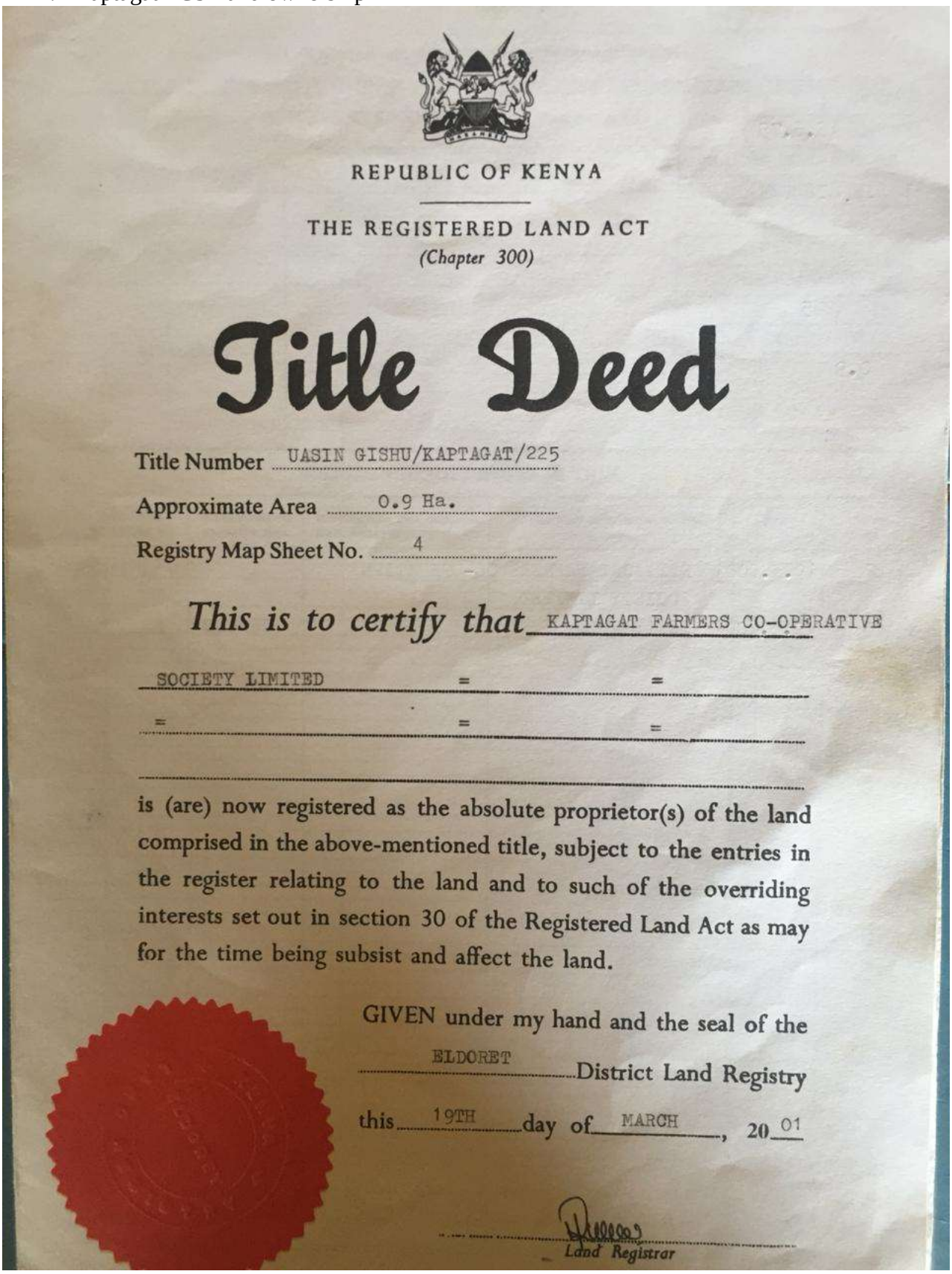
From the foregoing discussions, it is recommended that;

1. All activities concerning construction and maintenance such as work execution, site inspection and material testing shall be strictly monitored by a contractor or a designated official who shall be trained and experienced enough to judge the appropriateness of the works being carried out.
2. Implementation of an environmental management system which is an integral part of growth and development of any company and makes employees and contractors aware of the need to take a responsible approach to the management of the environment in their operations. This overall objective is to achieve continual improvement through monitoring and measuring performance.
3. Waste management strategy is critical to such a facility's operations. Otherwise 7Rs- refuse, return, refill, reduce, reuse, recycle and recover- are good practices for all the *Maziwa Lita Kumi* Initiative projects.
4. The proponent shall comply with the relevant principle laws, by-laws and guidelines issued for the development and operation of such projects.
5. Annual environmental audits should be carried out on all the *Maziwa Lita Kumi* Initiative projects in order to ensure the compliance of the project with mitigation measures outlined in the Environmental Social Management Plan (ESMP).

APPENDICES

APPENDIX 1; Land ownership documents

1. Kaptagat FCS Land ownership



REPUBLIC OF KENYA

THE REGISTERED LAND ACT
(Chapter 300)

Title Deed

Title Number UASIN GISHU/KAPTAGAT/225

Approximate Area 0.9 Ha.

Registry Map Sheet No. 4

This is to certify that KAPTAGAT FARMERS CO-OPERATIVE SOCIETY LIMITED = = = = = =

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 30 of the Registered Land Act as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the ELDORET District Land Registry this 19TH day of MARCH, 20 01

Land Registrar

2. Keitich FCC Land ownership

REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Title Number TULWET/KESSES BLOCK 2 (KETIPLONG)/125

Approximate Area 0.3077 Ha.

Registry Map Sheet No. 1

This is to certify that KEITICH CO-OPERATIVE SOCIETY

P.O. BOX 42, MOI UNIVERSITY

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the

ELDORET District Land Registry

this 26TH day of JULY 20 16

Land Registrar

3. Kimoning FCC Land ownership

REPUBLIC OF KENYA

THE CO-OPERATIVE SOCIETIES ACT
(*Cap*. 490, *Section* 6 (3))

Certificate of Registration

REGISTRATION No. CS/1983

I hereby certify that the society under the name of

KIMONING FARMERS CO-OPERATIVE SOCIETY LIMITED

and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi

this...30TH. *day of*.....SEPTEMBER....., *20*16.....

PHILIP N. GICHUKI
Ag. *Commissioner for Co-operative Development*

GPK (L) 1029—357—5/16

4. Kuinet FCC Land ownership

REPUBLIC OF KENYA
MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT
SOY SUB COUNTY

Telegrams: "DISTRICTER"
Telephone:
When replying please quote

OFFICE OF THE CHIEF,
KUINET LOCATION,
P.O. BOX 30-30100,
ELDORET.
02/1/16

Ref No.
And Date

TO THE LANDS DEPARTMENT
SOY SUB-COUNTY

Dear Sir

RE: PLOT NO. 44 KUINET TRADING CENTRE

I confirm that to the best of my knowledge the above plot located in Kuinet Trading Centre is a public utility plot and the community have used it to put a milk cooling plant. Assist confirm the same.

Yours faithfully

CHIEF
KUINET LOCATION

Benjamin K. Metto

5. Cingalo FCC Land ownership

REPUBLIC OF KENYA

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

OFFICE OF THE CHIEF
OL'LEINGUSE LOCATION
P. O. BOX 5-30302
LESSOS

DATE 07/06/2016

REF: OL ADEV.26/1/VOL II/053

THE COUNTY CO-OPERATIVE OFFICER
UASIN-GISHU COUNTY
P. O BOX 84
ELDORET.

RE: SENGALO FARMERS CO-OPERATIVE SOCIETY LTD.

The above Mentioned are based in This Location in Laingute Sub-Location in Kitingia Trading Centre.

The Public has granted them 1½ Acres with Kondoo Settlement scheme Plot NO 813 which is a public Land.

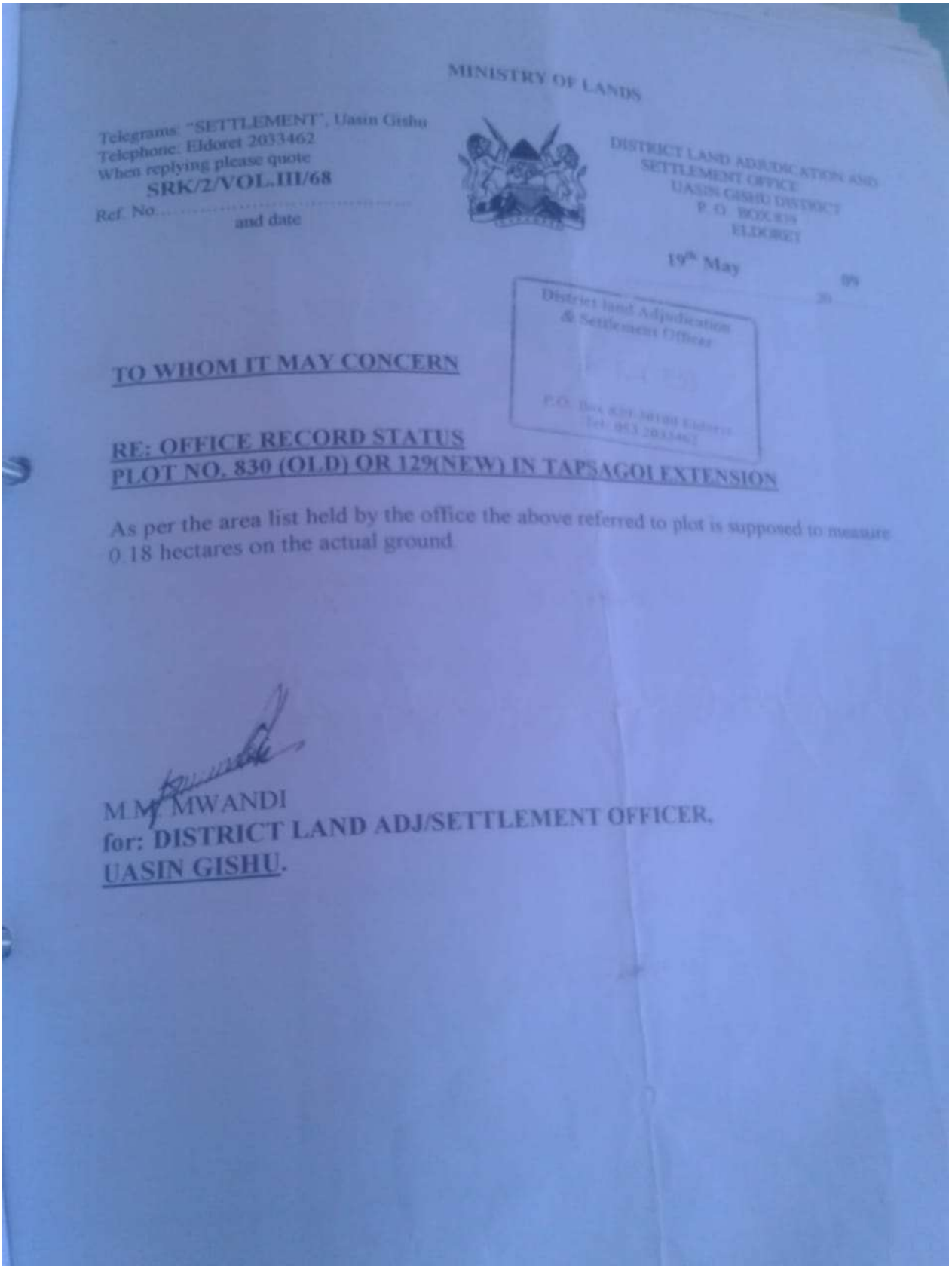
Kindly accord them the necessary assistance need to this end I do not have any objection on the same

Thank you.

CHIEF
OL'LEINGUSE LOCATION
KAPSENG DISTRICT
UASIN-GISHU COUNTY
Date... 07/06/2016

SAMUEL K. ROTICH
CHIEF OL'LEINGUSE LOCATION

6. Sugoi FCC Land ownership



MINISTRY OF LANDS

Telegrams: "SETTLEMENT", Uasin Gishu
Telephone: Eldoret 2033462
When replying please quote
SRK/2/VOL.III/68
Ref. No..... and date

DISTRICT LAND ADJUDICATION AND SETTLEMENT OFFICE
UASIN GISHU DISTRICT
P. O. BOX 839
ELDORET

19th May 19 99

District land Adjudication & Settlement Officer

P.O. Box 839-30100 Eldoret
Tel: 053 2033462

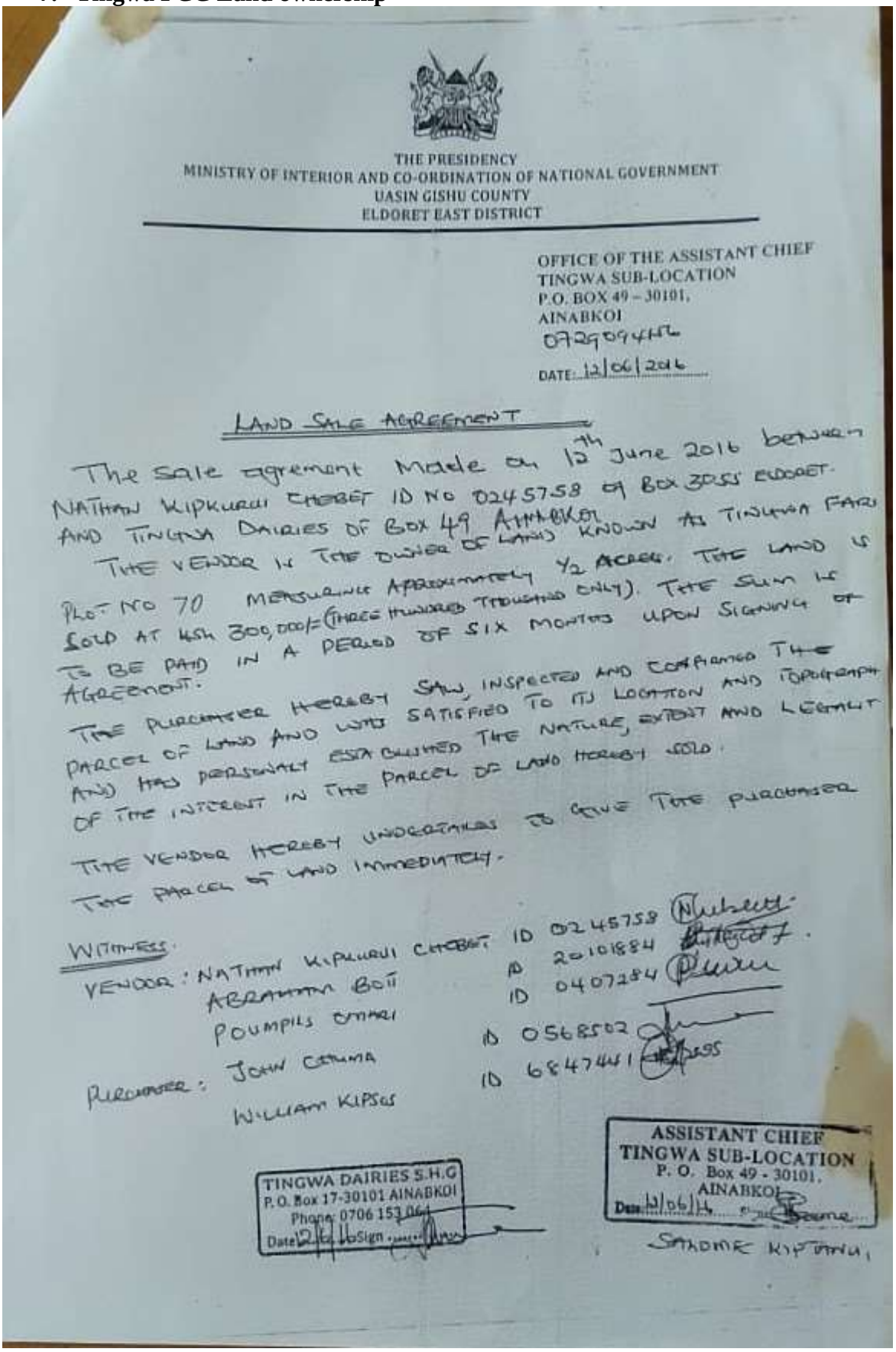
TO WHOM IT MAY CONCERN

RE: OFFICE RECORD STATUS
PLOT NO. 830 (OLD) OR 129(NEW) IN TAPSAGOLEXTENSION

As per the area list held by the office the above referred to plot is supposed to measure 0.18 hectares on the actual ground.

M.M. MWANDI
for: DISTRICT LAND ADJ/SETTLEMENT OFFICER,
UASIN GISHU.

7. Tingwa FCC Land ownership



THE PRESIDENCY
MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT
UASIN GISHU COUNTY
ELDORET EAST DISTRICT

OFFICE OF THE ASSISTANT CHIEF
TINGWA SUB-LOCATION
P.O. BOX 49 – 30101,
AINABKOI
0729094456

DATE: 12/06/2016

LAND SALE AGREEMENT

The sale agreement made on 12th June 2016 between NATHAN KIPKURUI CHEBET ID NO 02457558 of BOX 3055 ELDORET AND TINGWA DAIRIES OF BOX 49 AINABKOI

THE VENDOR IS THE OWNER OF LAND KNOWN AS TINGWA FARM PLOT NO 70 MEASURING APPROXIMATELY ½ ACRES. THE LAND IS SOLD AT KSH 300,000/= (THREE HUNDRED THOUSAND ONLY). THE SUM IS TO BE PAID IN A PERIOD OF SIX MONTHS UPON SIGNING OF AGREEMENT.

THE PURCHASER HEREBY SAW, INSPECTED AND CONFIRMED THE PARCEL OF LAND AND WAS SATISFIED TO ITS LOCATION AND TOPOGRAPHY AND HAS PERSONALLY ESTABLISHED THE NATURE, EXTENT AND LEGALITY OF THE INTEREST IN THE PARCEL OF LAND HEREBY SOLD.

THE VENDOR HEREBY UNDERTAKES TO GIVE THE PURCHASER THE PARCEL OF LAND IMMEDIATELY.

WITNESS.

VENDOR: NATHAN KIPKURUI CHEBET ID 02457558
ABRAHAM BOI ID 20101884
POUMPILS OMARI ID 0407284
JOHN CHUMA ID 0568502
WILLIAM KIPSOS ID 6847441

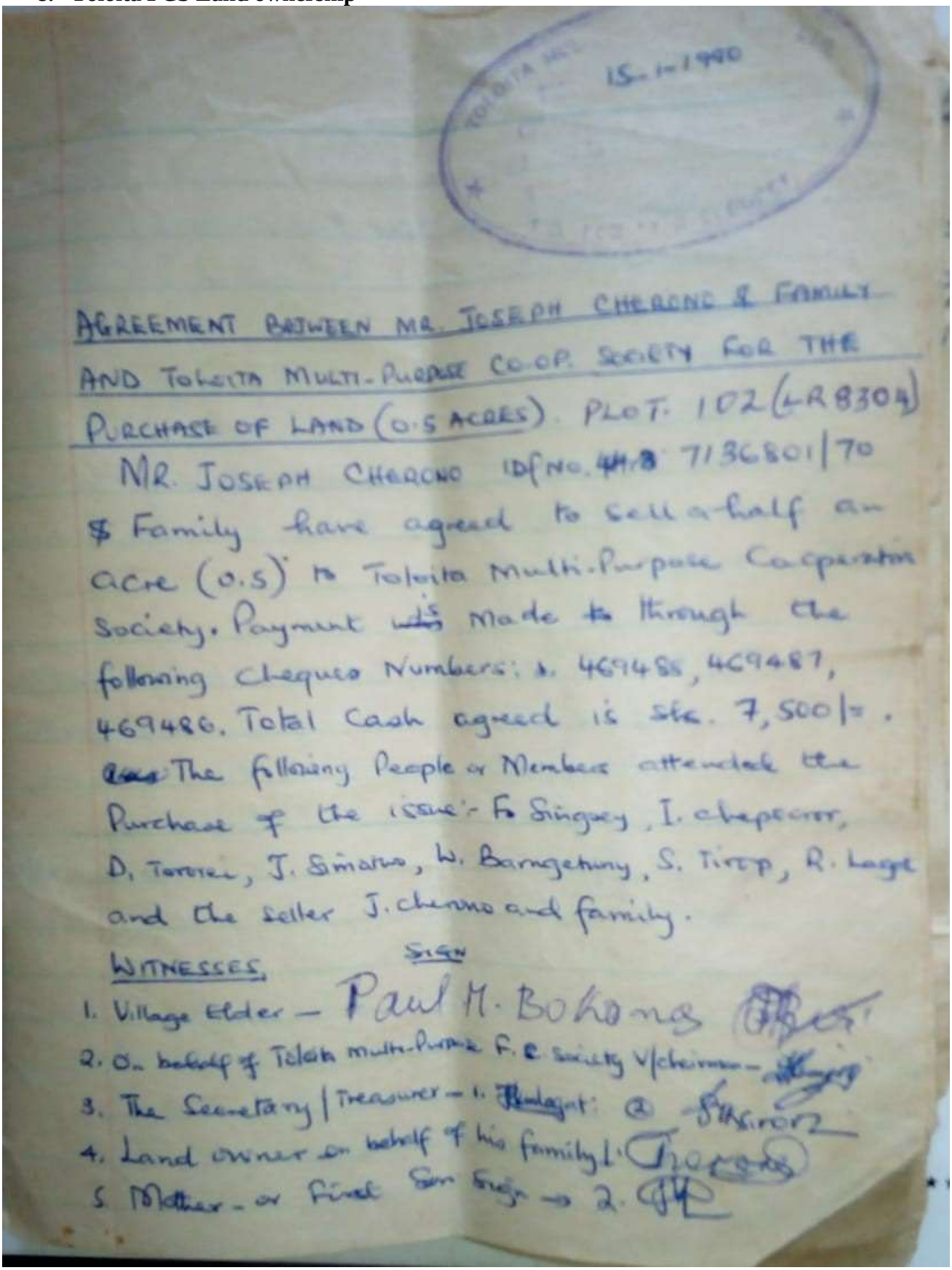
PURCHASER:

TINGWA DAIRIES S.H.G
P.O. Box 17-30101 AINABKOI
Phone: 0706 153 064
Date 12/6/16 Sign

ASSISTANT CHIEF
TINGWA SUB-LOCATION
P. O. Box 49 - 30101,
AINABKOI
Date 12/06/16

SAMOME KIPTANUI

8. Toloita FCS Land ownership



15-11-1990

AGREEMENT BETWEEN MR. JOSEPH CHERONO & FAMILY AND TOLOITA MULTI-PURPOSE CO-OP. SOCIETY FOR THE PURCHASE OF LAND (0.5 ACRES). PLOT. 102 (LR 8304)

MR. JOSEPH CHERONO IDF NO. 7136801/70 & Family have agreed to sell a-half an acre (0.5) to Toloita Multi-Purpose Co-operation Society. Payment is Made through the following Cheques Numbers: 1. 469485, 469487, 469486. Total Cash agreed is Shs. 7,500/=.

The following People or Members attended the Purchase of the issue:- Fr Singoey, I. chepeiyer, D. Torrich, J. Simatwa, W. Barngetuny, S. Tirop, R. Lagat and the seller J. cheruno and family.

WITNESSES. SIGN

1. Village Elder – Paul M. Bokong
2. On behalf of Toloita multi-Purpose F.C. Society V/chairman –
3. The Secretary/Treasurer – 1. Rotich 2. Simatwa
4. Land owner on behalf of his family 1. Joseph
5. Mother - or First Son Sign → 2.

9. Kaplesa FCS Registration

REPUBLIC OF KENYA

THE CO-OPERATIVE SOCIETIES ACT
(Cap. 490, Section 6 (3))

Certificate of Registration

REGISTRATION No. CS/20026

I hereby certify that the society under the name of

KAPLESA DAIRY FARMERS CO-OPERATIVE SOCIETY LIMITED

and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi

this 10TH *day of* MAY, 20 16

PHILIP N. GICHUKI
Ag. Commissioner for Co-operative Development

GPK(L)

10. Kaptagat FCS Registration

REPUBLIC OF KENYA

MINISTRY OF CO-OPERATIVE DEVELOPMENT

CERTIFICATE OF REGISTRATION

THE CO-OPERATIVE SOCIETIES ACT
(Cap. 490. Section 7)

REGISTRATION No. CS/1120

I hereby certify that the society under the name of

KAPTAGAT FARMERS CO-OPERATIVE SOCIETY LTD.

and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi this 10TH *day of* JUNE *,19* 64

E.K. MUREITHI

Commissioner for Co-operative Development

11. Keitich FCS land

REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Title Number TULWET/KESSES BLOCK 2 (KETIPLONG)/125

Approximate Area 0.3077 Ha.

Registry Map Sheet No. 1

This is to certify that KEITICH CO-OPERATIVE SOCIETY

P.O. BOX 42, MOI UNIVERSITY

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the

ELDORET District Land Registry

this 26TH day of JULY 20 16

Land Registrar

APPENDIX 2: GROUPS REGISTRATION CERTIFICTES

1. **Kimoning FCS Registration**

REPUBLIC OF KENYA

THE CO-OPERATIVE SOCIETIES ACT
(*Cap.* 490, *Section* 6 (3))

Certificate of Registration

REGISTRATION No. CS/1983

I hereby certify that the society under the name of

KIMONING FARMERS CO-OPERATIVE SOCIETY LIMITED

and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi

this...30TH. *day of*.....SEPTEMBER....., *20*16.....

PHILIP N. GICHUKI
Ag. *Commissioner for Co-operative Development*

GPK (L) 1029—357—5/16

2. Nd **Cooperative FCS Registration**

REPUBLIC OF KENYA

MINISTRY OF CO-OPERATIVE DEVELOPMENT

CERTIFICATE OF REGISTRATION

THE CO-OPERATIVE SOCIETIES ACT
(Cap. 491, Section 7)

REGISTRATION No. CS/5823

I hereby certify that the society under the name of

[illegible]

and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi this 10th day of [illegible]

[illegible]

Commissioner for Co-operative Development

3. Ndubeneti FCS Registration

REPUBLIC OF KENYA

THE CO-OPERATIVE SOCIETIES ACT
(Cap. 490, Section 6 (3))

Certificate of Registration

REGISTRATION No. CS/19420

I hereby certify that the society under the name of

NDUBENETI FARMERS CO-OPERATIVE SOCIETY LIMITED

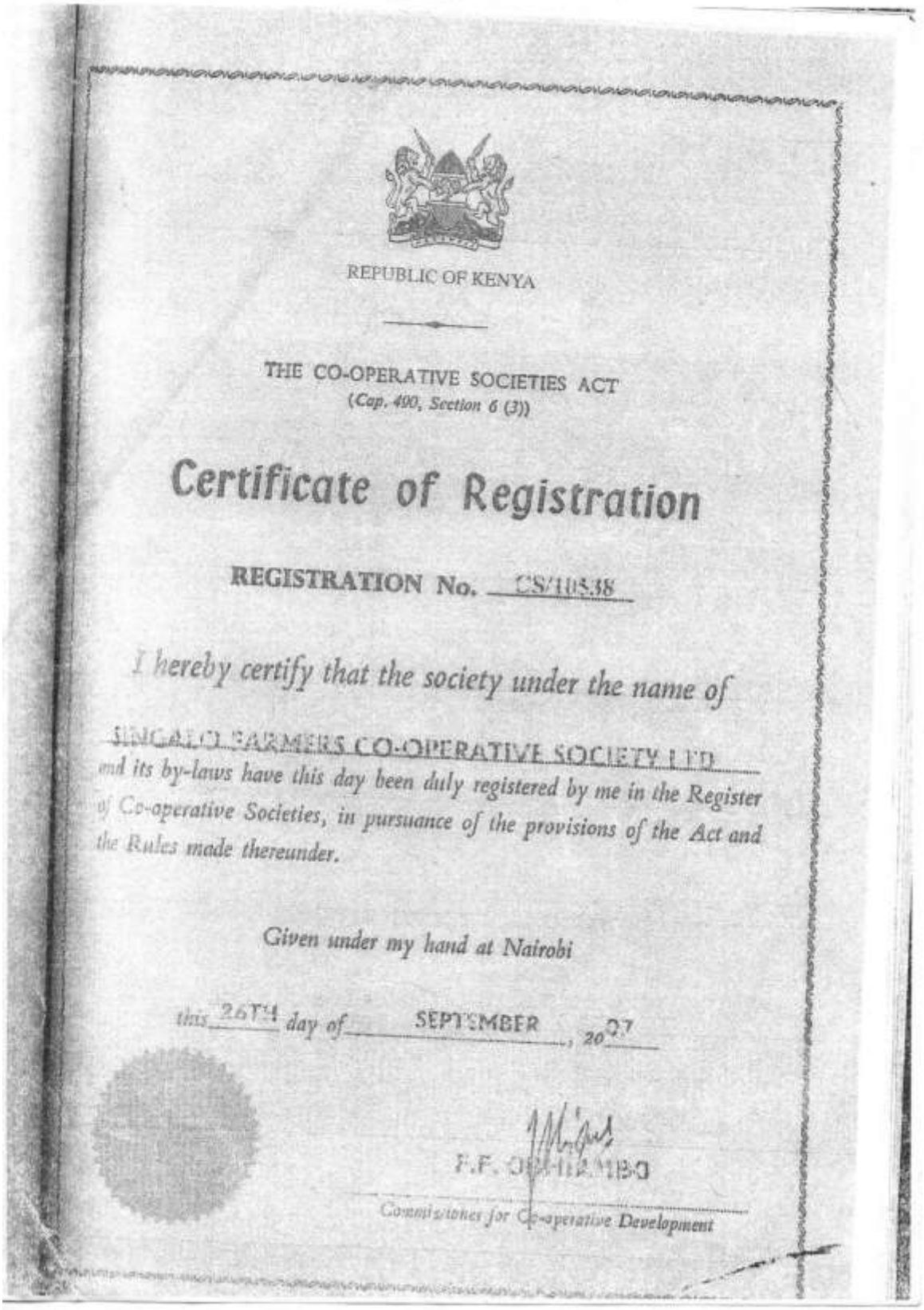
and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi

this 20TH *day of* JANUARY, 20 16

PHILIP N. GICHUKI
Ag. Commissioner for Co-operative Development

4. Singalo FCS Registration



REPUBLIC OF KENYA

THE CO-OPERATIVE SOCIETIES ACT
(Cap. 490, Section 6 (3))

Certificate of Registration

REGISTRATION No. CS/10538

I hereby certify that the society under the name of

SINGALO FARMERS CO-OPERATIVE SOCIETY LTD

and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi

this 26TH *day of* SEPTEMBER, 2007

F.F. OKUMBO

Commissioner for Co-operative Development

5. Sosiani FCS Registration

RENEWAL

REPUBLIC OF KENYA

THE CO-OPERATIVE SOCIETIES ACT
(*Cap. 490, Section 6 (3)*)

Certificate of Registration

REGISTRATION No. CS/1812

I hereby certify that the society under the name of

SOSIANI FARMERS CO-OPERATIVE SOCIETY LIMITED

and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi

this 18TH *day of* FEBRUARY, *20* 16

PHILIP N. GICHUKI
Ag. Commissioner for Co-operative Development

6. Sugoi FCS Registration

REPUBLIC OF KENYA

THE CO-OPERATIVE SOCIETIES ACT
(*Cap. 490, Section 6 (3)*)

Certificate of Registration

REGISTRATION No. CS/12391

I hereby certify that the society under the name of

SUGOI ALLIANCE FARMERS CO-OPERATIVE SOCIETY LIMITED

and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi

this 16TH *day of* DECEMBER, 2009

F.F. ODHIAMBO
Commissioner for Co-operative Development

GPK(L)

7. Tingwa FCS registration

Certificate No. 3593290

Republic of Kenya

MINISTRY OF LABOUR, SOCIAL SECURITY AND SERVICES

Certificate of Registration of Self-helpGroup/Project

This is to certify that

TINGWA DAIRY SELF HELP GROUP

Group Name/Project

ELD/EAST/SS/REG/2[illegible]/2013
Registration No.

[illegible]/2013
Date of Registration

[illegible]
Sub-location/Ward

[illegible]
Constituency

[illegible]
Location

AINABKOI
Sub County

AINAEKOI
Division

UASIN GISHU
County

is registered with the Office of the Sub County Social Development Officer as a Self-Help Group/Project

Name ..... Signature .....
County Social Development Coordinator

Name C A RoP Signature RoP
Sub County Social Development Officer

[illegible]
Date of Issue

Note: The Contents of this Certificate Should not be erased, altered or defaced in any way.

8. Toloita FCS registration

REPUBLIC OF KENYA

MINISTRY OF CO-OPERATIVE DEVELOPMENT

CERTIFICATE OF REGISTRATION

THE CO-OPERATIVE SOCIETIES ACT
(Cap. 490. Section 7)

REGISTRATION No. CS/5709

I hereby certify that the Society under the name of

TOLOITA MULTIPURPOSE CO-OPERATIVE SOCIETY LTD.

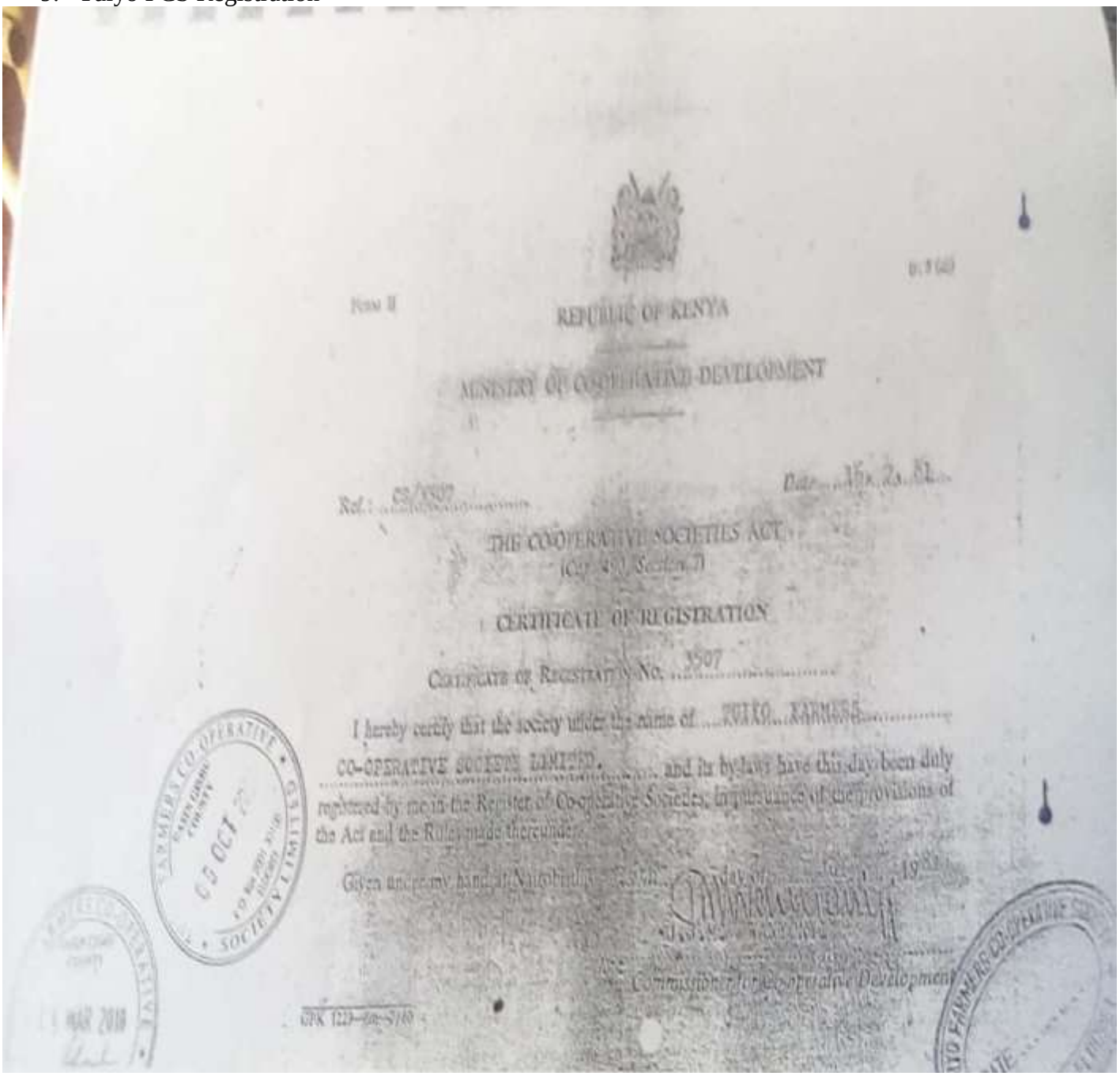
and its by-laws have this day been duly registered by me in the Register of Co-operative Societies, in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi this 16TH *day of* AUGUST *,19*89

R. A. BOMETT

Commissioner for Co-operative Development

9. Tuiyo FCS Registration



Form II

REPUBLIC OF KENYA

MINISTRY OF CO-OPERATIVE DEVELOPMENT

Ref.: CS/3507 Date 14th Jan 82

THE CO-OPERATIVE SOCIETIES ACT
(Cap 490, Section 7)

CERTIFICATE OF REGISTRATION

Certificate of Registration No. 3507

I hereby certify that the society under the name of TUIYO FARMERS CO-OPERATIVE SOCIETY LIMITED and its by-laws have this day been duly registered by me in the Register of Co-operative Societies in pursuance of the provisions of the Act and the Rules made thereunder.

Given under my hand at Nairobi this 25th day of January 1982

Commissioner for Co-operative Development

GPK 1223—6m—5/80

CS OCT

SOCIETY LIMITED

APPENDIX 3; SAMPLED PUBLIC QUESTIONAIRES

Sampled Public participation Questionnaire responses

1

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

Kenya Climate Smart Agriculture Uasin Gishu coordinating unit intends to operationalize selected FCS in the county under the Maziwa Lita Kumi initiative. This is a questionnaire that has been drafted as a tool seeking comments from the general public regarding the projects to necessitate informed advice to the proponent. You are therefore invited to give your comments on the proposed project; please note that all information given in this questionnaire will be treated as **UTMOST CONFIDENTIAL**

1. Are you aware of the operations and commissioning of this FCS?
   (✓) Yes ( ) No
2. Do you support the proposed comminioning?
   (✓) Yes ( ) No
3. Will there be any adverse negative impacts you anticipate with this project, e.g air pollution or poor waste management that may affect you?
   ( ) Yes (✓) No
4. Do you think there will be any potential negative impacts to any existing cultural or historical land uses on the proposed site if the project is conducted there?
   ( ) Yes (✓) No
5. Do you think the project shall lead to increased levels of Noise and vibration in the area?
   ( ) Yes (✓) No
6. Do you think with the development on site in this plot may lead to increased insecurity and social crimes within the area?
   ( ) Yes (✓) No
7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes (✓) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here
   The project will benefit Sule A mill in the Community to profit.

Your Signature ..... **ID No.** 14216882

**Thank you very much for your participation!*

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

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   (✓) Yes ( ) No
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   (✓) Yes ( ) No
3. Will there be any adverse negative impacts you anticipate with this project, e.g air pollution or poor waste management that may affect you?
   ( ) Yes (✓) No
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6. Do you think with the development on site in this plot may lead to increased insecurity and social crimes within the area?
   ( ) Yes (✓) No
7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes (✓) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here

   .....

   .....

Your Signature ..... **ID No.** 32050413?

*Thank you very much for your participation!

3

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

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   (/) Yes ( ) No
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   (/) Yes ( ) No
3. Will there be any adverse negative impacts you anticipate with this project, e.g air pollution or poor waste management that may affect you?
   ( ) Yes (/) No
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   ( ) Yes (/) No
6. Do you think with the development on site in this plot may lead to increased insecurity and social crimes within the area?
   ( ) Yes (/) No
7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes (/) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here
   ……/……
   ……

Your Signature ……Edwin Kandie…… **ID No.** ……21602130……

**Thank you very much for your participation!*

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

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   ( ) Yes (✓) No
7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes (✓) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here
   Support the project
   .....

Your Signature Kim Belulo **ID No.** 2247206

**Thank you very much for your participation!*

5

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

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6. Do you think with the development on site in this plot may lead to increased insecurity and social crimes within the area?
   ( ) Yes (✓) No
7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes (✓) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here

   .....

   .....

Your Signature ..... **ID No.** 1444/2064

**Thank you very much for your participation!*

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

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7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes ( ) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here
   .....
   .....

Your Signature ..... **ID No.** .....

**Thank you very much for your participation!*

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

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6. Do you think with the development on site in this plot may lead to increased insecurity and social crimes within the area?
   ( ) Yes (✓) No
7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes (✓) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here
   ....the project was not bad....
   .....

Your Signature ....Eunice..... **ID No.** ....10964040....

**Thank you very much for your participation!*

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

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   ( ) Yes (✓) No
6. Do you think with the development on site in this plot may lead to increased insecurity and social crimes within the area?
   ( ) Yes (✓) No
7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes (✓) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here
   The project is good fair
   .....

Your Signature ..... **ID No.** 23462590

**Thank you very much for your participation!*

10

PUBLIC PARTICIPATION QUESTIONAIRE ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT UNIT

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   ( ) Yes (✓) No
6. Do you think with the development on site in this plot may lead to increased insecurity and social crimes within the area?
   ( ) Yes (✓) No
7. Do you expect any employment to you or general public during construction and operation of the proposed development?
   Yes (✓) No ( )
8. Do you have any reservation or comments concerning the proposed commissioning of this project? If yes please list some here
   ..... the project was not bad. .....
   .....

Your Signature ..... **ID No.** 24643044

**Thank you very much for your participation!*

APPENDIX 4: MINUTES OF PUBLIC BARAZA

MINUTES OF PUBLIC PARTICIPATION FOR THE PROPOSED MAZIWA LITA KUMI PROJECT

MEMBERS PRESENT

(see attached list)

AGENDA

1. INTRODUCTION
2. PUBLIC RESPONSE ON THE PROPOSED MAZIWA LITA KUMI PROJECT
3. AOB

The meeting started at exactly 10.25 AM with a word of prayer from Jane Serem . The meeting was then called into order by the village elder present, he encouraged everybody to be attentive and listen carefully to the information being disseminated therein.

MIN 1/13/2/2020 INTRODUCTION

The area chief stood to introduce all members present including the expert team who were in attendance. He registered his gladness that the members of the community had heed to the call for the meeting and attended in good time. He then welcomed the expert team to proceed with the meeting as planned.

MIN 2/13/2/2020 PUBLIC RESPONSE ON THE PROPOSED MAZIWA LITA KUMI PROJECT

A lengthy discussion went on with members who are farmers registering their gratitude on the acceptance of the project and funding.

One member Mr Samson Lel asked on which best way to mitigate likelihood of fire razing down hay store saying it will be difficult for the county fire engines to reach the community. He also raised and issue of liquid waste management practices in the farms and in the chilling plant which according to him has not been meeting the best standards and mitigation as required.

The lead expert present told the meeting that it is the responsibility of each farmer to ensure that wastes are segregated and disposed off properly following the guidelines provided, that the farm waste may be used as compost manure in the farm. He urged each farmer to consider fire risk assessment when storing hay, to ensure hay is kept far away from likely fire points in the compound, he challenged each famer to have at least two fire extinguishers which may come in handy in case of fire.

Member farmers asked that the project coverage should be increased to all famers in the county with strategies to improve the breeds and solve the frequent menace of disease outbreaks in the county. He also urged the government through the county to help seek the market for milk and other milk product which he says going forward at the success of the project will be produced in plenty. The officials present promised to share these concerns with the relevant departments in the county.

The community present also requested that they be given a lot of training and sensitization on the modern methods of farm production and management as many farmers lack technical knowhow in managing their agricultural practices, the lead expert promised to have this issues shared together with KCSAP for such arrangements.

MIN 3/13/2/2020 AOB

There being no other business, the leaders of the FCS thanked all for participating in the discussion. The meeting ended at 2.20PM with a word of prayer from John Limo.

COFIRMED BY

LEAD EXPERT

APPENDIX 5; LIST OF PUBLIC BARAZA ATTENDANCE
List of Respondent Attendance

PUBLIC PARTICIPATION LIST ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT

Date .....

No	Name	ID No	Gender M/F	Age	Contact	Signature[2]
1.	Tobias Bett	7164361	M	64		
2.	Philip Serem	7116722U	M	58		
3.	Abraham Tor	7352221	M	53	0713211776	
4.	Moses Lelei	25[illegible]3655	M	32	0726 75480	
5.	Emmanuel Lagat	25953864	M	29	0707962172	
6.	Kipkoech Kipkosgei	4709107	M	67	0729 814 614	
7.	Dickson Kosgei	32478296	F	44		
8.	Doris Sumoei	12832557	F	45	0715407151	
9.	Salimah Kosgei	31185L	F	57		
10.	Daniel Sitienei	7445023	M	54	0714129745	
11.	Gilbert Kosgei	14528054	M	43	0726776864	
12.	Bernard Tenge	25482277	M	33	0726 859718	
13.	Joel K. Kemei	12468G8	M	42		
14.	Julius Kosgei	7445022	M	44		
15.	Francis Kosgei	26083871	M	33		
16.	Philip Lagat	23279772	M	36		
17.	Richard Kipruto	2292-7166	M	31		
18.	Sallat Jerop	25311203	F	29		
19.	Hosiny Jebet	33453513	F	32		
20.	Joseph Kipkurui	32904324	M	26	0727 29111	
21.	Kelvin K. Tuei	9871316	M	51	0720 208130	
22.	James Kosgei	14626228	M	44		
23.	Joel Kosgei	32241619	M	41		
24.	Daniel Kemboi	13366885	M	38		
25.	Moses Kemboi	25412U3	M	31		
26.	Richard Koech	13366875	M	48		
27.	Isaac Kemboi	28704857	M	30		
28.	Julius K Koech	23294788	M	37		
29.	Simon Kosgei	25836127	M	34		
30.	Amos Kibet Atieno	29134951	M	27		

[2] As much as possible, individual group members should sign against their names as indicated and unless under special circumstances, they should not be less than 10 members per CIG/SHG

PUBLIC PARTICIPATION LIST ON PREPARATION OF ENVIRONMENTALSOCIALMANAGEMENT PLAN (ESMP) FOR MAZIWA LITA KUMI INITIATIVE BY KENYA CLIMATE SMART AGRICULTURE UASIN GISHU CORDINATING UNIT

Date ..15-Sept-2020.....

No	Name	ID No	Gender M/F	Age	Contact	Signature[2]
1.	Stella chepkorei	35259023	F	F	0702171119	
2.	Serah Jelagat Kemei	68747046	F	60		
3.	Bernard Kipkielle Sang	24719786	M	33		
4.	Agnes chepkemoi Muteo	1770165	F	59		
5.	Valentine Jepngetich	3594 3326	F	23		
6.	Lucy Jeito Sang	32404413	F	25		
7.	Shadrack Kiprotich	29082565	M	27		
8.	Vincent Kipkogei Tanui	32711545	M	27	0704935195	
9.	Vivian chepchich Mutei	24782788	F	35		
10.	Jane chelimo Kiberenge	4905045	F	70		
11.	Judy Jepkech Kibor	12628667	F	60		
12.	Isaack Kimeli Serem	10574817	M	50		
13.	Sheilla chepkemei Tego	24621670	F	26		
14.	Shadrack K. Tagot	28953560	M	26	0707962182	
15.	Benjamin K. Songok	22269524	M	37	0713827498	
16.	Lynne chemp Kosgei	33965599	F	22	0700251216	
17.	Vicky Jeptoo	38198394	F	22	0797107102	
18.	Sharon Cheptoo	25504311	F	33	0704 663887	
19.	Julius K. Koech	29086159	M	27	0715228088	
20.	JANE C. SEREM	24431156	F	44	0703924512	
21.	Thomas K. Koech	3289167	M	67	0715 570410	
22.	WINNY TANUI	24065234	M	38		
23.	JOSEPH K. ROTICH	26537171	M	43	0723543505	
24.	MUSEI KIPKEMEI	29153774	M	27	0725046066	
25.	Kipkemoi Bargei	7156843	M	51	0721706414	
26.	Kipkirui Bumoi	3367195	M	67	0790066237	
27.	Faith J. Bett	4706830	F	64		
28.	Kipkoech Bett	49-6858	M	62		
29.	James K Rotich	23835	M	67		
30.	Kipkemoi Masai	6863702	M	56		

[2] As much as possible, individual group members should sign against their names as indicated and unless under special circumstances, they should not be less than 10 members per CIG/SHG

APPENDIX 6: MINUTES OF THE FGD

MEEETING HELD ON 24th March, 2020 AT TOLOITA AND KUINET FCS

Members Present

- See attached list

AGENDA

1. OVERVIEW OF MAZIWA LITA KUMI PROJECT
2. RESPONSE FROM THE MEMBERS
3. AOB

The meeting started at 12.26PM with a word of prayer from John Limo. The chairperson of the FCS stood to welcome all the members to the meeting, while thanking all the officials from attending he welcomed the Lead expert present to continue with the discussion

MIN1/24/2020 OVERVIEW OF MAZIWA LITA KUMI PROJECT

The lead expert explained in detail the proposed project, he detailed the selected FCS who will benefit from the project and the benefits which will come along to the participating farmer groups. He called upon each member to take lead in ensuring success of the project through active participation zeal in promoting increase in milk production at the household level.

The women present said that the project will go along way in elevating the economic strengths in the county, in addition help in boosting the health of at Household level.

MIN. 2/3/2020 RESPOINSE FROM THE MEMBERS PRESENT

The members were invited to give their views on the proposed project. Mr. Caleb Soi expressed gratitude on behalf of the youth on the project, he called upon strict adherence to the environmental guidelines provided by NEMA to make the project sustainable and environmental friendly.

Jane Maiyo agreed that provision of this project will help in boosting the economy of the area by bringing more jobs, she said the health status in households will improve since various food especially milk will be available for consumption, he thanked especially KCSAP and the funding entities for approving this project.

After a lengthy discussion, the members present agreed that the negative impact presented far much outweighs the positive contribution of the project to the community. The members were in agreement that their contribution to the success of the project is immense and are ready to do so going forward.

MIN 3/3/2020 AOB

There being no other business the meeting ended at exactly 2.40PM.

CONFIRMED BY

LEAD EXPERT

APPENDIX 7: LIST OF FGD ATTENDACE

ATTENDANCE LIST FOR FGD MEETING KIAZIWA LITA KUMI PROJECT AT TOLOITA FCS & KUINET FCS 24/4/2020

	NAME	ID NO	SIGNATURE
1	Grace Sirma	14424021	
2	John Martin	12161818	
3	Caleb Sui	6429700	
4	Jane Mayo	29604021	
5	Joh Limo	642023	
6	Koech Sedrack	23237248	
7	Daniel Koech	24603112	
8	Mirriam Bett	20234060	
9	Esther Tergut	12160412	
10	Christine Lagat	60412183	
11	Linda Save	24356012	
12	Daniel limo	22304041	
13	Caroline Cheluo	24806021	
14	Festus Bett	12170060	
15	Eliava Kiplimo	4002060	
16	Bethuel mayo	42060920	
17	Daniels Kibet	23237042	
18	Lina Chebiwott	53587041	
19	Melina Chelagat	24806088	
20	Christopher Kelmengit	12603940	