ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
OF THE
THE SIERRA TROPICAL LTD'S AGRICULTURAL PROJECT IN LUGBU CHIEFDOM, BO DISTRICT

ADDENDUM TO ESMP ON SIERRA TROPICAL LTD'S AGRICULTURAL PROJECT IN BO

Prepared by

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for:

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ACRONYMS

^{0}C Degrees Celsius
CDAP Community Development Action Plan
CEMMATS Construction Engineering Maintenance, Manufacturing and Technical Services
dB decibels
EHS Environmental Health and Safety
EPA-SL Environment Protection Agency – Sierra Leone
ESIA Environmental and Social Impact Assessment
ESMP Environmental and Social Management Plan
ERP Emergency Response Plan
GIS Geographic Information Systems
GoSL Government of Sierra Leone
GRC Grievance Redress Committee
GRM Grievance Redress Mechanism
IFC International Finance Corporation
MDA Ministries, Departments and Agencies
NGO Non-Governmental Organization
PAC Project Affected Communities
PAPs Project Affected Persons
PCDP Public Consultation and Disclosure Plan
PM Particulate Matter
TOR Terms of Reference
WMP Waste Management Plan

1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Sierra Tropical Ltd (STL) is a wholly owned subsidiary of Dole Asia Holdings Pte Ltd, a Singapore-based agro-processing company. The Company arrived in Sierra Leone in 2014 with the aim of embarking on an agro-processing project involving large scale planting and processing of tropical fruits in Bo District, southern Sierra Leone.

In compliance with local regulations EPA Act 2008/2010, STL applied for and was granted an EIA Licence in 2018, covering the first two phases of project implementation, involving the development of up 4,335 hectares of agricultural land in the Lugbu Chiefdom.

Depending on the success of the first phase and early second phase of the project, in terms of quality/productivity of the fruits, it was planned that a processing facility would be constructed in the later stages of the second phase, to process the raw materials into manufactured products in various packages of cans, drums, plastics and boxes. It has now been confirmed that the project will proceed with the development of the processing facility, necessitating an extension of the original ESIA study.

This Environmental and Social Management Plan (ESMP) is an addendum to the main ESMP developed for the STL agro-processing project. The initial study covered the implementation of the first two phases of the project, involving 4,335ha of agricultural land in Lugbu Chiefdom, Bo district, and focussed mainly on the agricultural operations of the project. The ESMP consequently contained plans geared towards the management of impacts identified in relation to their agricultural activities.

The current study revolves around the development of the agro-processing facility to be developed in Benduma Sewa, a village in Lugbu Chiefdom. This addendum includes management measures to be implemented during the construction and operations of the processing facility, and should be read in conjunction with the main ESMP for the Project.

1.1 Content of ESMP Addendum

New management measures focussing on the construction and operations of the processing facility have been included as part of the following Management Plans found in the main ESMP:

- Environmental Health and Safety Plan (EHSP)
- Waste Management Plan (WMP)
- Public Consultation and Disclosure Plan (PCDP)
- Community Development Action Plan (CDAP)
- Closure Plan

The following are plans contained in the main ESMP, but not featured in this addendum, as their contents either already adequately address issues applicable to both the agricultural and processing aspects of the project, or are not relevant to the processing aspect:

- Emergency Response Plan (covers emergency types applicable to processing facilities)
- Pesticide and Chemical Management Plan (applicable to any chemicals to be used in processing)
- Resettlement Policy Framework (not applicable to the processing facility).

2 ENVIRONMENTAL HEALTH AND SAFETY PLAN (EHSP)

2.1 Introduction

The EHS Plan in the main ESMP includes EHS guidelines for Perennial Crop Production according to IFC. It also includes a description of STL's project-specific environmental considerations for the development and maintenance of their fruit plantations. The plan also includes occupational health and safety guidelines (OHS), community health and safety guidelines (CHS) and an outline of STL Management responsibilities, which remain relevant for both the agricultural and processing aspects of the project.

The following sections include additional EHS management measures specifically addressing the construction and operations phases of the project.

2.2 Environmental Health and Safety during Construction

During the construction phase of the project, STL management will largely be concerned with controlling impacts which will result from the various activities undertaken by the construction contractor. It is important to recognize that successful mitigation of construction impacts can only be achieved if the environmental issues are identified and the related mitigation measures, are set out in the construction contract, and are properly enforced.

The Construction Contractor will be required to submit a site-specific EHS plan, based on the guidelines provided in this plan, to STL. The objective of the contractor's EHS plan includes minimising incidences of environmental degradation that may result from activities on site.

2.2.1 IFC General Environmental, Health, And Safety Guidelines for Construction-Type Projects

The International Finance Corporation provides general EHS guidelines to be considered in construction-type projects. The measures described in the following sections relate to specific environmental aspects applicable to this project.

2.2.1.1 Noise and Vibration

During construction activities, noise and vibration may be caused by the operation of pile drivers, earth moving and excavation equipment, concrete mixers, cranes and the transportation of equipment, materials and people. Some recommended noise reduction and control strategies to consider in areas close to community areas include:

- Planning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance;
- Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines;

- Avoiding or minimizing project transportation through community areas.

2.2.1.2 Air Quality

Construction activities may generate emission of fugitive dust caused by a combination of on-site excavation and movement of earth materials, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind. A secondary source of emissions may include exhaust from diesel engines of earth moving equipment, as well as from open burning of solid waste on-site. Techniques to consider for the reduction and control of air emissions from construction sites include:

- Minimizing dust from material handling sources, such as conveyors and bins, by using covers and/or control equipment (water suppression, bag house, or cyclone);
- Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content;
- Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements;
- Avoiding open burning of solids.

2.2.1.3 Soil Erosion

Soil erosion may be caused by exposure of soil surfaces to rain and wind during site clearing, earth moving, and excavation activities. The mobilization and transport of soil particles may, in turn, result in sedimentation of surface drainage networks, which may result in impacts to the quality of natural water systems and ultimately the biological systems that use these waters. Recommended soil erosion and water system management approaches include:

<u>Sediment mobilization and transport</u>

Reducing or preventing erosion by:

- Scheduling to avoid heavy rainfall periods (i.e., during the dry season) to the extent practical
- Contouring and minimizing length and steepness of slopes
- Mulching to stabilize exposed areas
- Designing channels and ditches for post-construction flows
- Lining steep channel and slopes (e.g. use jute matting)
- Reducing or preventing off-site sediment transport through use of settlement ponds, silt fences, and water treatment, and modifying or suspending activities during extreme rainfall and high winds to the extent practical

Road design

- Limiting access road gradients to reduce runoff-induced erosion
- Providing adequate road drainage based on road width, surface material, compaction, and maintenance

Structural (slope) stability

- Providing effective short term measures for slope stabilization, sediment control and subsidence control until long term measures for the operational phase can be implemented
- Providing adequate drainage systems to minimize and control infiltration.

2.2.2 Occupational Health and Safety during Construction

The IFC also prescribes OHS guidelines for construction projects. Those applicable to this project include:

- Over exertion
- Work at height
- Slips and fall
- Struck by object
- Moving machinery
- Dust Exposure

2.2.2.1 Over Exertion

Repetitive motion, over-exertion, and manual handling are common causes of injuries in construction sites.

Recommendations for their prevention and control include:

- Training of workers in lifting and materials handling techniques in construction projects, including the placement of weight limits above which mechanical assistance is required or two-person lifts are necessary
- Planning work site layout to minimize the need for manual transfer of heavy loads
- Selecting tools and designing work stations that reduce force requirements and holding times, and which promote improved postures, including, where applicable, user adjustable work stations
- Implementing administrative controls into work processes, such as job rotations and rest or stretch breaks

2.2.2.2 Work at Height

Falls from elevation associated with working with ladders, scaffolding, and partially built structures are the most common cause of fatal or permanently disabling injury at construction sites.

Recommendations for the prevention of fall from height include:

- Training and use of temporary fall prevention devices, such as rails or other barriers able to support a weight of 200 pounds when working at heights equal or greater than two meters or at any height if the risk includes falling into operating machinery, into water or other liquid, into hazardous substances, or through an opening in a work surface.
- Training and use of personal fall arrest systems, such as full body harnesses and energy absorbing lanyards able to support 5000 pounds, as well as fall rescue procedures to deal with workers whose fall has been successfully arrested. The tie in point of the fall arresting system should also be able to support 5000 pounds
- Use of control zones and safety monitoring systems to warn workers of their proximity to fall hazard zones, as well as securing, marking, and labelling covers for openings in floors, roofs, or walking surfaces.

2.2.2.3 Slips and fall

Slips and falls are associated with poor housekeeping, such as excessive waste debris, loose construction materials, liquid spills, and uncontrolled use of electrical cords and ropes on the ground, are also among the most frequent cause of lost time accidents at construction and decommissioning sites.

Recommended methods for the prevention of slips and falls from, or on the same elevation include:

- Implementing good house-keeping practices, such as the sorting and placing loose construction materials away from footpaths
- Cleaning up excessive waste debris and liquid spills regularly
- Locate electrical cords and ropes in common areas and marked corridors
- Use of slip retardant footwear

2.2.2.4 Struck by Object

Construction activities pose significant hazards related to the potential fall of materials or tools, as well as ejection of solid particles from abrasive or other types of power tools which can result in injury to the head, eyes, and extremities. Techniques for the prevention and control of these hazards include:

- Using a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels

- Conduct sawing, cutting, grinding, sanding, chipping or chiselling with proper guards and anchoring as applicable.
- Maintaining clear traffic ways to avoid driving of heavy equipment over loose scrap
- Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as hand rails and toe boards to prevent materials from being dislodged.
- Evacuating work areas during blasting operations, and using blast mats or other means of deflection to minimize fly rock or ejection of demolition debris if work is conducted in proximity to people or structures
- Wearing appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes

2.2.2.5 Moving machinery

Vehicle traffic and use of lifting equipment in the movement of machinery and materials on a construction site do pose temporary hazards, such as physical contact, spills, dust, emissions, and noise. Heavy equipment operators have limited fields of view close to their equipment and may not see pedestrians close to the vehicle

Techniques for the prevention and control of these impacts include:

- Plan and segregate the location of vehicle traffic, machine operation, and walking areas, and control vehicle traffic through the use of one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic
- Ensure the visibility of personnel through their use of high visibility vests when working in or walking through heavy equipment operating areas, and training of workers to verify eye contact with equipment operators before approaching the operating vehicle
- Ensure moving equipment is outfitted with audible back-up alarms
- Use inspected and well-maintained lifting devices that are appropriate for the load, such as cranes, and securing loads when lifting them to higher job-site elevations.

2.2.2.6 Dust Exposure

Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements. Workers should also be provided with dust protection PPE, such as dusk masks, which should be used where dust levels are excessive.

2.2.3 Community Health and Safety during Construction

Projects should implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning.

Risks may arise from inadvertent or intentional trespassing, including potential contact with hazardous materials, contaminated soils and other environmental media, buildings that are vacant or under construction, or excavations and structures which may pose falling and entrapment hazards. Risk management strategies may include:

- Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community
- Removing hazardous conditions on construction sites that cannot be controlled affectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials

2.2.3.1 Traffic Safety

Construction activities may result in a significant increase in movement of heavy vehicles for the transport of construction materials and equipment increasing the risk of traffic-related accidents and injuries to workers and local communities. The incidence of road accidents involving project vehicles during construction should be minimized through a combination of community sensitization and awareness-raising.

2.3 Environmental, Health, and Safety During Operations

During operations, management will be concerned with eliminating or minimising impacts on the environment resulting from processing activities. The company will implement an EHS management system for this phase, in line with the IFC EHS guidelines for food and beverage processing.

2.3.1 IFC General Environmental, Health, and Safety Guidelines for Food and Beverage Processing

These guidelines are applicable to fruit processing (among other products) for human consumption, and provides guidelines for EHS issues associated with processing operations.

The measures described in the following sections relate to the environmental aspects applicable to this project.

2.3.1.1 Emissions to Air

The main air pollutant from food and beverage processing operations is odour.

Odour:

Recommended techniques to prevent and control point source odour emissions include:

- Use exhaust stack heights that are consistent with Good Engineering Practice (GEP)

- Consider the use of wet scrubbers to remove odour emissions. Wet scrubbers are used to remove odours with a high affinity to water, such as ammonia
- During the procurement of air emission systems for smoking units, it is best practice to install integrated systems that combine air cleaning, incineration, and heat recovery. Such systems are highly effective with regard to the reduction of odour emissions, production/ energy efficiency;
- Recirculate exhaust gas from cooking operations to the burner. Recommended techniques to prevent and control fugitive emissions of odour include:
    - Minimize storage duration for solid waste to avoid putrefaction;
    - Operate facilities under partial vacuum to prevent fugitive odour emission;
    - Regular inspection of chilling and freezing equipment to monitor loss of refrigerants.

Exhaust Emissions:

Exhaust emissions include the release of air pollutants typically associated with the combustion of fossil fuels, such as nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate matter (PM), as well as other air pollutants including certain volatile organic compounds (VOCs) and metals that may also be associated with a wide range of industrial activities.

Use of alternative fuels such as renewable energy sources will ultimately eliminate or minimise exhaust emissions.

2.3.1.2 Energy Consumption:

Food and beverage processing activities may require high levels of thermal energy consumption in process heating, cooling, and refrigeration. Industry specific energy conservation measures include the following:

- Implement operational, maintenance and housekeeping measures:
    - Insulate refrigeration room/areas and use of automatically closing doors and airlocks
    - Insulate refrigeration rooms / areas
- Optimize plant processes for energy efficiency:
    - Use Combined Heat and Power (CHP) particularly in plants which have high heat and power demand for more than 5000 hours/year
    - Reduce the size of refrigeration rooms where feasible, but still taking food safety into consideration

- Design plant layout to reduce pumping and conveyor belt transportation distances
- Ensure that fouling on heat transfer surfaces, for example in the sterilization process, is regularly cleaned to ensure optimum efficiency
- Use high temperature pre-cooling before refrigerated cooling and freezing, for example, after blanching prechill products by passing them cold water before freezing. This is particularly cost –effective when liquid nitrogen freezing is used.

2.3.2 Occupational Health and Safety during Operations

IFC EHS guidelines discuss occupational health and safety (OHS) issues for general industrial environments as well as guideline for food and beverage processing operations.

These guidelines discussed in the following subsections are relevant to the STL project and will be incorporated into the company's OHS management system.

2.3.2.1 Physical Hazards

Physical hazards represent potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity. Single exposure to physical hazards may result in a wide range of injuries, from minor and medical aid only, to disabling, catastrophic, and/or fatal. Multiple exposures over prolonged periods can result in disabling injuries of comparable significance and consequence.

Rotating and Moving Equipment

Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Recommended protective measures include:

- Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance, in conformance with a standard such as CSA Z460 Lockout or equivalent ISO or ANSI standard
- Routine servicing of equipment, such as lubrication, without removal of the guarding devices or mechanisms.

Noise

Noise impacts will be mitigated in line with the following guidelines:

- No employee should be exposed to a noise level greater than 85dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).

- The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).
- Although hearing protection is preferred for any period of noise exposure in excess of 85dB(A), an equivalent level of protection can be obtained, but less easily managed, by limiting the duration of noise exposure. For every 3 dB(A) increase in sound levels, the 'allowed' exposure period or duration should be reduced by 50 percent.
- Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented, where feasible.

Working Environment Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injury or death. Use of personal protective equipment (PPE) to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation.

Work spaces will be effectively ventilated or air-conditioned.

Ergonomics, Repetitive Motion, Manual Handling

Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems will be minimized through the implementation of measures in line with the following guidelines:

- Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds
- Making tools available to workers that reduce force requirements and holding times, and improve postures
- Providing user adjustable work stations
- Incorporating rest and stretch breaks into work processes, and conducting job rotation
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions

Illumination

Work area light intensity should be adequate for the general purpose of the location and type of activity, and should be supplemented with dedicated work station illumination, as needed.

Controls will include:

- Use of energy efficient light sources with minimum heat emission
- Undertaking measures to eliminate glare / reflections and flickering of lights
- Precautions to minimize and control optical radiation including direct sunlight. Exposure to high intensity UV and IR radiation and high intensity visible light should also be controlled

Additional, industry-specific recommendations to be implemented include the following:

- Maintain walking and working surfaces clean and dry by preventing spillages through equipment design and operation, providing workers with anti-slip footwear where still necessary;
- Control of occupational risks at their source through implementation of engineering controls. Address residual risks through hygiene and safety surveys and by providing workers with training in the proper use and maintenance of safety devises (including the proper use of machine safety devises) and personal protective equipment (PPE), such as hearing protection, and gloves, aprons etc. to avoid cuts, amputations, and other sharp instrument traumas;
- Ensure that the process layout reduces opportunities for process activities to cross paths, thus avoiding collisions and falls;
- Demarcate transport corridors and working areas and ensure the proper placement of handrails on platforms, ladders, and stairs;
- Ground all electrical equipment and installations;
- Prepare emergency plans and train staff for emergency situations.

2.3.3 Community Health and Safety during Operations

IFC's guidelines for issues with the potential to impact the community during operations of a facility of this nature are those associated with hygiene and food safety.

2.3.3.1 Process, Equipment, and Staff Hygiene

The work process should be such that products move from "dirty" to "clean" areas to avoid recontamination, and subsequent possible food infections/poisoning in consumers. Employee movement within the facility should be opposite to the flow direction of products (i.e. from "clean" towards "dirty" zones).

Staff will be trained in food safety issues and will be required to follow established procedures for hand washing, working attire (clothes, shoes, gloves and hair coverage), and how to handle injuries and diseases.

2.3.3.2 Food Safety

With a robust food safety program in place, a company can protect itself from product adulteration, contamination, and the need for food recalls. Food and beverage processing should therefore be performed according to internationally recognized food safety standards such as ISO, WRAP, GMO, GMP/HACCP Rainforest Alliance (chain of Custody) BRC (UK), Kosher/Halal and SGF (juice authenticity), to which STL and parent company Dole, adhere

In general, recommended food safety principles include:

- Strictly maintain cold chains and other preservation processes;
- Sanitation
- Good Manufacturing Practice (GMP)
- Pest control
- Chemical control
- Allergen control
- Staff hygiene and education
- Customer complaints mechanism
- Traceability and reuse

3 WASTE MANAGEMENT PLAN (WMP)

3.1 Introduction

The following sections of this plan, include guidelines for waste management during the construction and operations of the processing facility. It should be read in conjunction with the main WMP for the project which identifies the typical categories of wastes which will be generated by the project, describes the handling and disposal methods to be employed, and assigns responsibility for the implementation, management and monitoring of an effective waste management system for the project.

3.2 Waste Management during Construction

Non-hazardous solid waste generated at construction sites includes excess fill materials from grading and excavation activities, scrap wood and metals, and small concrete spills. Other types of wastes generated by construction workers include domestic (non-hazardous) wastes such as food, paper, plastics, etc. which have been treated in the main ESMP. Hazardous solid waste may also be generated such as fuel contaminated soils, which have also been covered in the main WMP of the ESMP.

3.2.1 Construction Wastes

Construction wastes include unwanted materials produced as a result of construction activities. This category of waste could include materials such as:

- concrete;
- wood;
- packaging (cement bags, plastic, cardboard);
- waste steel;
- nails.

Handling these wastes will start at the pre-construction stage where bills of materials quantities will be calculated. Calculations will be done in such a way as to limit the generation of scrap or unwanted materials.

Material re-use will also be enforced where possible to ensure that maximum use of available materials is made and limit as best as possible the materials which would have to be disposed of.

Segregation of wastes at source will be enforced through the provision of labelled waste bins, which will be stationed around active construction areas. These waste bins will be specifically for the disposal of solid, non-hazardous construction wastes.

3.2.2 Earthworks Waste (Spoils)

Spoils are unwanted and unusable rock or soil materials generated from earthworks. Spoils management will include the following options:

- Minimisation of spoils generation through design and management;

- Reuse of spoils within the Project where practicable;
- Beneficial reuse of spoils outside the Project for environmental and community works;
- Backfilling of any borrow pits with spoils materials, and
- Disposal of spoils outside the Project for non-beneficial uses (landfilling).

Spoils generated will be temporarily stored at identified spoil sites until a decision of the final method of re-use or disposal is decided on. Spoils will not be stored in areas that are sloping or where surface runoff can easily wash away the materials.

3.3 Waste Management during Operations

3.3.1 Solid Waste

Depending on the raw materials, food and beverage processing activities may generate significant volumes of organic, putrescible solid waste in the form of inedible materials and rejected products from sorting, grading and other production processes.

IFC EHS guidelines include the following recommendations for the control and prevention of solid wastes generated by food and beverage processing:

- Minimize inventory storage time for raw materials to reduce losses from putrefaction;
- Monitor and regulate refrigeration and cooling systems during storage and processing activities to minimize product loss, optimize energy consumption, and prevent odours;
- Consider use of enclosure techniques to minimize damage to raw materials stored outdoors;
- Monitor and optimize process yields, e.g. during manual grading or cutting activities, and encourage the most productive employees to train others in efficient processing.
- Clean, sort, and grade raw foodstuffs at an early stage (e.g. at the farm site), in order to reduce organic waste and substandard products at the processing facility;
- Contain solid waste in dry form and consider disposal through composting and/or use for soil amendment;
- Organic and non-organic debris / soil, solid organic matter, and liquid effluents, including sludge from wastewater treatment, which remain after the implementation of waste prevention strategies should be recycled as a soil amendment (based on an assessment of potential impacts to soil and water resources) or other beneficial uses such as energy production;
- Collect and reuse rejected raw materials for manufacturing other products;
- Provide leak-proof containers for collected solid and liquid waste;
- Segregating individual by-products from each other and from waste to maximize their use and minimize waste.

3.3.2 Waste Water

3.3.2.1 Industrial Process Wastewater

Effluent streams from food and beverage processing may have a high biochemical and chemical oxygen demand (BOD and COD) resulting from organic wastes entering into the wastewater stream, and from the use of chemicals and detergents in various processes including cleaning.

In addition, effluent may contain pathogenic bacteria, pesticide residues, suspended and dissolved solids such as fibres and soil particles, nutrients and microbes, and variable pH. The effluent load should be reduced by preventing raw materials, intermediates, product, by-product and wastes from unnecessarily entering the wastewater system.

3.3.2.2 Process Water Treatment

Process wastewater treatment techniques for treating industrial process wastewater in the food and beverage sector include:

- Grease traps, skimmers or oil water separators for separation of floatable solids;
- Flow and load equalization;
- Sedimentation for suspended solids reduction using clarifiers;
- Biological treatment, typically anaerobic followed by aerobic treatment, for reduction of soluble organic matter (BOD);
- Biological nutrient removal for reduction in nitrogen and phosphorus;
- Chlorination of effluent when disinfection is required;
- Dewatering and disposal of residuals.

In some instances composting or land application of wastewater treatment residuals of acceptable quality may be possible. Additional engineering controls may be required to contain and neutralize nuisance odours.

STL will be operating a waste water treatment plant which will be a combination of aerobic and facultative treatment. The influent biological oxygen demand (BOD) and chemical oxygen demand (COD) is calculated to be 1,800-4,200ppm and 2,400-3,500ppm, respectively. After treatment, the effluent BOD and COD will be 11-24 ppm and 26-70 ppm, respectively.

4 COMMUNITY DEVELOPMENT ACTION PLAN (CDAP)

The Community Development Action Plan developed for the roll out of the first few phases of the STL project is contained in the main ESMP. The plan details STL's commitment to implementing community development programmes and projects within Lugbu Chiefdom in the following broad areas:

- Community Agricultural Support Programme – Materials and Funding
- Support to Health
- Support to Education
- Support to Water and Sanitation

Given that the community of Benduma Sewa is the host community, and along with neighbouring Gelehun will most likely experience impacts from the processing facility, an additional budget will be allocated for community development assistance directed to them specifically. The budget allocation is presented in Table 4-1.

Table 4-1: CDAP Budget Allocation to Benduma Sewa and Gelehun

Projects	Budget USD					
	Construction Phase		Operations Phase			
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total
Community Agricultural Support Programme – Materials and Funding	1,500	1,500	2,500	3,500	3,500	12,500
Support to Health	1,000	1,000	1,500	2,000	2,000	7,500
Support to Education	1,000	1,000	1,500	2,000	2,000	7,500
Support to Water and Sanitation	1,500	1,500	2,500	3,500	3,500	12,500
Total	**5,000**	**5,000**	**8,000**	**11,000**	**11,000**	**40,000**

5 PUBLIC CONSULTATION AND DISCLOSURE PLAN (PCDP)

The PCDP for this project, developed during the main ESIA studies was designed to provide community stakeholders, government stakeholders, non-governmental organizations (NGOs), and other interested parties with project information and to allow them to participate in the project implementation.

The plan remains applicable for the development and operation of the processing facility and contains a section with broad guidelines for the development of a Grievance Redress Mechanism (GRM). This PCDP provides some additional guidelines for the development and implementation of an effective GRM applicable to all aspects of the project (not just the processing facility). It also describes the public consultations held during this study.

5.1 Grievance Redress Mechanism (GRM)

During the implementation of the project, it is likely that disputes/disagreements between STL and the affected persons will occur.

GRM is a management system through which grievances will be resolved following a standard operating procedure (SOP) aligned to other management systems (communication, resourcing, reporting). A grievance mechanism provides a way to reduce risk for the project and offers communities an effective avenue for expressing concerns and achieving remedies, and promotes a mutually constructive relationship. A well-functioning grievance mechanism:

- Provides a predictable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, and lasting;
- Builds trust as an integral component of broader community relations activities; and
- Enables more systematic identification of emerging issues and trends, facilitating corrective action and pre-emptive engagement.

Within this project the following principles need to be established to ensure the effectiveness of the GM:

- Commitment to fairness in both process and outcomes.
- Mainstreaming responsibility for addressing grievances throughout the project;
- Willingness of the Leadership of the project team to visibly and sincerely champion the grievance system.

A GRM is necessary for addressing the legitimate concerns of Project Affected Persons (PAPs), and will include:

- Provision for the establishment of a grievance redress committee that includes women;
- A reporting and recording system;

- Procedure for assessment of the grievance;
- A time frame for responding to the grievances filed;
- The mechanisms for adjudicating grievances and appealing judgments.

In the interest of all parties concerned, the GRM should be designed with the objective of solving disputes at the earliest possible time, and should implicitly discourage referring matters to the court system for resolution.

5.1.1 Establishment of a GRM

There is no ideal model for grievance resolution. The best solutions to conflicts are generally achieved through mechanisms that take account specific issues including cultural context, project conditions and scale. In its simplest form, a grievance mechanism can be broken down into the following primary components:

- A simple template for reporting grievances will be available at the STL administrative offices, and other strategic locations throughout the chiefdom, for ease of access. Through community consultations, the availability and correct use of these forms will be discussed with participants. The option for verbal reporting of grievances will also be made known to them.
- STL will have a grievance log that will be kept for recording complaints. The log will indicate the date the complaint was lodged, actions to be taken and personnel or team responsible for the complaint;
- A local community liaison person or vulnerable group liaison will be appointed with whom grievances may initially be logged, particularly in project areas some distance away from the administrative office;
- STL Community Liaison Officer or GRM Officer will monitor and document the progress of all complaints through bi-weekly reporting to STL management.

5.1.2 Establishment of a Grievance Redress Committee (GRC)

A Grievance Redress Committee will be established for reviewing and reaching decisions on complaints received. In the absence of a specific legislative requirement for establishing an independent grievance mechanism, a project specific grievance mechanism should be established which should be appropriate and transparent to promptly and effectively receive and address grievances.

The GRC will include but not be limited to:

- Representative(s) of STL Management
- Community Women's representative
- Community representatives of vulnerable groups (e.g. elderly and handicapped)

- Local authorities

5.1.3 Reporting, Recording, and Transmission of Grievances

- Grievances must be filed with the STL administrative office. Complaints may initially be lodged with appointed community representatives (such as a local authority) in areas a distance from the administrative office; the community representatives will be responsible for lodging the complaints with STL.
- Grievances may be made in writing and be signed and dated by the PAP where possible. Where not possible, they can be made verbally. The PAPs shall receive complete information related to their rights and complaint procedures for the purpose of enabling them to submit their complaints, orally or in writing.
- Grievances received verbally must be documented, verified and signed or thumbprint by the PAP and the officer receiving the report;
- The Grievance Officer shall establish a grievance log or register; all reports must be recorded in the log;
- The grievance log shall outline details of the complaint.
- Arrangements will also be made for the filing of anonymous complaints;
- STL's Community Liaison Officer, or an assigned GRM Officer shall submit the grievance reports to Grievance Redress Committee, with copies sent to STL Management within 24 hours of receipt.

5.1.4 Review and Handling of Grievances

- Review and handling of grievances shall be conducted by the GRC;
- The nature of the grievance would ascertain the period (not exceeding 5 working days) necessary for the GRC to review the grievance.
- Where resolution is not reached at the level of the GRC or the PAP is not satisfied with the GRC's decision, provision will be made to allow the PAP to appeal.
- If the PAP is not satisfied with the decision of the GRC or the response to the appeal, he/she as a last resort may submit the complaint to a court of law.
- The PAP shall be exempt from all administrative and legal fees incurred pursuant to the grievance redress procedures.

5.2 Public Consultation During ESIA Study

Public Consultations conducted during this study for the development of the Processing Facility include focus group discussions held in the chiefdom headquarter town of Sumbuya,

and the two closest communities of Benduma Sewa and Gelehun.

The meetings provided opportunities for residents of the communities closest to the planned facility site, and stakeholders of the chiefdom headquarter town to ask questions and raise any concerns they might have about the project.

Information on the proposed development of the processing facility was received positively, with some participants from Benduma Sewa expressing their continued support of STL, highlighting their good relationship with the company since the inception of the project.

The minutes of all meetings and discussion held as part of the PCDP process during the ESIA study can be found in the appendices of the addendum to the ESIA (volume 1 of this ESIA on the processing facility).

6 CLOSURE PLAN

It is assumed that at the end of the project's economic life, the related facilities will be decommissioned and the land returned to its pre-project state. Realistically, it is not likely that the project facilities will be uprooted, but more likely handed over to new management to continue to agro-processing project, or convert the facilities to some other use. However, for the purposes of this assessment, the following sections describe the steps that would need to be taken to completely shut down and decommission the processing facility, leaving the project site in a state wherein it can be used for economic benefit, by the host community.

Community consultations will be an integral aspect during closure, to provide a platform for discussions on closure options and an opportunity to become involved in the various stages of the process.

The following sections describe how various areas of the facility will be decommissioned

6.1 Facility Salvage

6.1.1 Production Areas

- Machinery and equipment will go through cleaning and decontamination. Floor drains and sumps will also be cleaned and decontaminated.
- Wastes from production areas will be removed and disposed of through re-use, recycling or disposal.
- Production plants and equipment will be dismantled. An assessment of the status of these items will have been prior to dismantling, to determine their end use. Functioning equipment or parts may be sold or given away. Remaining scraps may be shipped out of the country for recycling, or disposed of in a registered landfill site, in the absence of acceptable locally available disposal options.
- Fixtures and fittings will be removed (e.g. air conditioners, sinks, refrigeration units, etc.). These will be sold or donated, if still functional. They will otherwise be disposed of in a registered landfill site, in the absence of acceptable locally available disposal options.
- All remaining specialised equipment will be sent for suitable re-use or sold to an interested party. Obsolete equipment will be recycled where possible or otherwise disposed of by landfilling.

6.1.2 Utilities/Chemical/Fuel Storage Areas

- Fuels, oils, chemicals or any other materials used in utilities will be returned to the relevant vendors, sold or donated
- Dismantling of storage tanks (underground and surface), equipment
- Cleaning and decontamination of the tanks and equipment

- Waste oils, lubricants and fuels will be sent for suitable re-use or disposal as appropriate. Any hazardous waste arising from the plant and utilities areas will be removed from site by an authorised waste management company and disposed in a suitably licensed facility.

6.1.3 Laboratory Areas

- Return to vendor, sale or donation of all unopened and in-date laboratory chemicals
- Removal of all opened chemical containers and out-of-date chemicals for recycling or disposal
- Cleaning and decontamination of laboratory instruments, storage areas, waste systems.
- Obsolete equipment will be disposed of; functional equipment will be sold or donated to interested parties.

6.1.4 Warehouse

- Negotiation with buyers/interested parties for the distribution any products still in stock
- Dismantling of shelves and other removable features. These will be sold or donated to interested parties for re-use
- Cleaning and decontamination of the storage areas.

6.1.5 Offices, Administration, Reception, etc.

- Sorting and archiving of all physical and electronic documents and records. Unwanted documents will be disposed of.
- Removal of administration equipment (computers, printers, copiers, etc.) for reuse or sale to interested party, where possible, otherwise for disposal by a licensed contractor.

6.1.6 Maintenance and Engineering

Workshop equipment and fixtures (underground and surface) will be dismantled and functional items sold or donated. Obsolete items will be recycled if possible, sold for scrap, or disposed of in a licensed landfill in the absence of any acceptable locally available disposal options.

6.1.7 Waste Water Treatment Plant

- Emptying of tanks and pits/lagoons
- Removal of any associated chemicals, oils or any other materials used in the water treatment process.
- Dismantling of equipment and general cleaning and maintenance
- Backfilling and grading of open-pits/lagoons with backfill material

- Selling or donation of equipment or parts to interested parties. Disposal of obsolete parts using local recycling options if available, or landfilling.

6.2 Demolition and Reclamation

On completion of facility salvage involving the removal of all moveable resources and equipment, the structure will be completely demolished by a licensed demolition contractor.

Following demolition and disposal activities, the site will be graded to create a natural final topographic relief. The only material to be included in re-grading the facilities will be inert material such as concrete, stone, and brick used for foundations. Compacted surfaces will be ripped to relieve compaction and reduce surface run-off and sediment transport.

During facility closure, confirmation sampling and testing of the soils will be completed as needed to verify that areas have not been impacted by hydrocarbons or other potentially hazardous substances. In the case where hazardous substances are identified, the contaminated areas will be remediated.

The site will be reclaimed, following the same processes of sediment and erosion control, seed and plant propagation discussed in the main ESMP report.

6.3 Financial Provision for Closure

A life of project closure assumes effective rehabilitation or remediation of relevant impacts on the environment and the surrounding community. The assessment of closure costs involves the quantification of infrastructure components and applying rates to rehabilitate each component.

The company is theoretically budgeting a sum of $500,000 for closure and reclamation of the processing facility.

7 MANAGEMENT, MITIGATION, MONITORING AND IMPLEMENTATION MEASURES

7.1 Management and Monitoring Plans

The following tables detail the monitoring and management measures and targets to be put in place during the construction and operational phases of the processing facility. It also includes allocated expense budgets for meeting the stated targets.

Table 7-1: Costs for Management and Monitoring during Construction

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
Air Quality	• Dust minimization measures shall be implemented including watering of the construction areas, including the road surfaces under construction. • Soil stockpiles and stores of friable material will be covered to reduce the potential for fugitive emissions of dust where possible. • Vehicles carrying friable materials will be enclosed or sheeted. • Loading, unloading and handling of dusty materials will only be carried out in designated areas. • Workers would be provided with dust protection PPE	Weekly monitoring of project sites (facility and road work sites) involving in-situ measurements (PM10 and PM2.5) and observational assessments of point sources of pollution.	Air quality measurements resulting from construction activities should fall within the following thresholds: PM 2.5 - 25µg PM 10 - 50 µg	2x per week	**1,500**	
Noise and Vibration	• Activities producing excessive noise levels, will be restricted to the day-time, and equipment normally producing high levels of noise will be suppressed or screened when working within a distance of some 200 m from any sensitive noise receptors (particularly along access road alignments) • Near places of worship, construction producing nuisance level noise be minimised or rescheduled so as not to occur on locally recognised religious day. This is particularly relevant along the access road alignment. • Work areas, will be organised and operated to restrict	Weekly monitoring of project sites involving in-situ measurements and observational assessments of generations sources producing noise levels exceeding prescribed thresholds.	Noise levels resulting from construction activities should fall below 70dB in construction areas.	2x per week	**1,500**	

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
	noise levels to not exceed recommended thresholds at the nearest sensitive receptor during normal activities. As current noise levels in and around the project area already exceed this threshold value (55dB), the project will strive to not cause more than a 3dB increase in measured ambient levels during normal activities. • Advance notice will be given to communities if short-term noisy construction activities are to take place, which could cause these levels to be exceeded. Measures to minimize noise during construction will include: • locating and orientating equipment to maximise the distance, and to direct noise emissions away from, sensitive areas; • using buildings, earthworks and material stockpiles as noise barriers where possible, and turning off equipment when not in use. • A preventative maintenance program established for equipment and vehicles to not emit excessive noise or vibration due to inadequate maintenance or damage • Personnel will be made aware of the importance of minimising noise and the measures that are required in this regard.					
Soil Erosion	• Slope stability measures will be incorporated such as benching and installation of erosion protection features	Observational assessment of project areas where soil erosion is likely to occur due	Minimised risk of erosion and resultant clogging of nearby drains, pollution of	Weekly in the land preparation stage of	Embedded in design and	Impact risk is likely to disappear

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
	such as silt barriers and sedimentation ponds. • Land area to be cleared will be kept to the minimum necessary to prevent disturbance of soils outside the streams or other surface water bodies will be protected where practicable to provide natural attenuation of flows. • In areas of ground clearance, topsoil will be stripped and salvaged as much as possible	to loose exposed soil.	water bodies, etc.	construction	construction costs.	after the land preparation stage.
Water Quantity	• Water for construction will be sourced from project boreholes. • Water use will be monitored and recorded to maximise efficiency of water use and minimise waste. • Re-use of water will be undertaken where practical and safe.	Keep record of water consumption figures and identify areas to limit consumption and maximise re-use	Zero impact on local water availability and accessibility.	Daily	Embedded in design and construction costs.	
Water Quality	• Refuelling, maintenance and wash-down of construction vehicles and equipment will only occur in designated areas and away from surface water bodies, and provided with secondary containment measures. • The construction contractor will be contractually required to take all reasonable precautions to prevent and clean up all spills / leaks, and take necessary measures to prevent materials from falling into the river.	Observational assessments on potential situations at the various sites that could lead to water pollution. Periodic sampling and laboratory analysis.	• Zero water pollution resulting from construction activities, materials, wastes. • Fast and effective spill management system	Observational assessments 2x per week Lab analysis quarterly and after any accidental release.	**1000**	

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
Aquatic Ecology	Protection of aquatic ecology through prevention of pollution of water bodies.	Observational assessments to identify aquatic pollution or potential sources of aquatic pollution	Zero release of pollutants into water bodies.	Periodic	No extra cost	
Terrestrial Fauna	• Clearing of areas within construction boundaries only. • Enforcement of rule to workers that any animals encountered during construction works should not be killed.	Monitoring of workers to ensure compliance.	Zero deaths of animals resulting from construction activities.	Daily by construction workers	No extra cost	
Vegetation	• Vegetation clearing will be confined to the immediate construction site.	Intensive supervision of vegetation clearing during land preparation stage.	Minimal loss of vegetation	Daily by construction workers in the land preparation stage of construction	No extra cost	
Waste Management	• Waste bins will be provided at all construction sites (facility and road works sites) for the disposal of the various types of wastes generated by the project. These bins will be clearly marked to facilitate segregation of waste, for collection, transportation and disposal. • Separation of domestic and hazardous waste at the source shall be strictly enforced. • Where possible, wastes will be re-used or recycled. • Burning of waste will not be permitted • All personnel will be trained in the appropriate management of waste according to the WMP.	• Monitoring of waste sources and disposal areas to ensure compliance with waste management procedures. • Record-keeping of waste generation volumes and collection/disposal schedules	• 100% disposal of wastes using approved methods stated in the WMP. • Storage and disposal of waste in designated, approved locations.	Daily	Embedded in design and construction costs.	

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
Waste Oil Management	• Waste oils generated by the project (vehicles and machinery) will be collected and stored in sealed containers and arrangements made with companies who can use them in their operations or manage their disposal. • Soils contaminated by waste oils encountered during the project will be scraped away and bagged, for disposal in a designated section of a waste dump area (in the absence of locally available recommended disposal methods).	• Monitoring of sites for signs of oil contamination/pollution and potential sources of contamination/pollution. • Monitoring of waste oil storage and disposal methods for compliance with disposal procedures. • Record-keeping of waste oil generation volumes and collection/disposal schedules	Zero land or water pollution resulting from improperly handled waste oil from construction activities.	Daily	No additional cost	
Emergency Response and Disaster Management	• Implementation of Emergency Response Plan, • Awareness raising among workers • Monitoring of potential situations leading to disaster.	• Monitoring of sites for potential emergency situations. • Record-keeping of training and sensitization programmes for workers in terms of frequency and participant numbers.	Zero loss of life, injury, property damage resulting from emergency situations.	• Daily monitoring of potential emergency situations • Weekly training on emergency response	**1,000**	
Road Safety	• Community consultations and meetings on the ongoing road works and related hazards will be held.	• Record-keeping of community meetings and consultations in	Zero road accidents	Weekly	**2,000**	Cost assigned is for community consultations; sse of road safety

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
	• Active sites will be sealed off from the public using reflective tapes and cones; where necessary road diversions will be created. • Road safety initiatives will be developed and implemented, including: - Ensuring that only qualified (licenced) drivers operate machinery; - Implementing speed limits and traffic control measures in appropriate locations; - Implementing road safety signage; - Installing speed control devices such as governors on trucks	terms of frequency and participant numbers. • Monitoring of project sites to ensure implementation of road safety measures				signage and qualified technicians are embedded in the project costs.
Occupational Health and Safety	• The contractor will be required to submit an OHS management plan • Workers will be provided with all the required PPE. • Toolbox talks will be carried out daily on safe work practices and other OHS issues.	• Monitoring of project sites to ensure that PPE is provided and used. • Ensure availability of first aid kits • Confirm the organisation of toolbox talks	• Zero lost time injury • Zero fatalities • Fast and effective response to incidents	Daily by contractor	Embedded in design and construction costs.	
Gender Based Violence	• Incorporate GBV policies into contracts for construction contractors. • Construction contractors will be required to produce GBV management procedures and requirements to be adhered to by workers.	• Inspect construction sites for GBV risks • Consult with workers on GBV issues on site	• Minimise incidences/reports of GBV among workers and communities • Efficient response and handling of reported	- Daily implementation of GBV Codes of conduct; - Weekly awareness	**2,000**	Cost assigned is for awareness programmes and training; no added costs for implementation of GBV CoC

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
	• Promote female-friendly hiring and working conditions including the provision of separate toilet facilities for male and female workers, daylight working hours, etc. • Implement effective reporting and response mechanism for handling GBV complaints within the workforce and the project site community. • Develop GBV awareness programmes for communities through radio jingles, leaflets, posters, meetings, etc.		cases.	programmes		
STDs, HIV/AIDS and Teenage Pregnancy Issues	• Sensitization and awareness raising will be provided among workers and communities. • All Project personnel will be provided with appropriate induction training communicating health hazards, including HIV/AIDS, STDs and malaria along with the prevention and mitigation measures required. • Inappropriate behaviour by Project personnel will be carefully managed through relevant human resources processes, to minimise the potential spread of illnesses and infective diseases.		Regular instalments of sensitization programmes	Monthly	**2,000**	
Community Health	• Community health and safety will form an integral part of the construction management plan. • Community consultation and awareness raising on construction and road rehabilitation progress along the	• Record-keeping of community meetings and consultations in terms of frequency and participant numbers.	• Zero accidents/incidents related to construction activities • Fast and effective response to incidents	Monthly		

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
	access road will be carried out throughout project implementation. Communities will be advised on safety measures to take and the meanings of signs to be used. • A high standard of housekeeping will be maintained at all times in all construction work areas. • Pools of standing water will be avoided to minimise the availability of breeding grounds for mosquitoes.					
Total Quarterly Budget during the Construction Phase					**11,000**	

Table 7-2: Costs for Management and Monitoring during Operations

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
Air Quality	• Dust minimization measures shall be implemented including watering of the access road. • Speed limits will be implemented and enforced.	Weekly monitoring along access road involving in-situ measurements (PM10 and PM2.5). Observational assessments of vehicles' compliance with speed limits.	Air quality measurements should fall within the following thresholds: PM 2.5 - 25µg PM 10 - 50 µg	Weekly	**1500**	
Noise and Vibration	• Personnel will be provided with noise protection PPE for use in noisy areas of the facility.	Weekly monitoring within facility and along access roads.	Noise levels should fall below 70dB.	Weekly	**1500**	

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
	• Noisy machinery (e.g. generators) will be housed/screened where possible to contain the sound to a limited area. • Workers in noisy areas will not be allowed to work for more than 8hours at a time in the noisy environment					
Water Quality	A Waste Water Treatment Plant will be installed which includes several settling ponds, aerated and facultative lagoons. Water quality will be monitored at each step, and final effluent into the environment will meet WB effluent standards.	Monitoring of final effluent parameters before release into the environment.	Zero environmental pollution resulting from the facility's effluent.	Daily	Embedded in project's operational costs	
Waste Management	• Waste bins will be provided in all areas of the facility for the disposal of the various types of wastes generated by the project. These bins will be clearly marked to facilitate segregation of waste, for collection, transportation and disposal. • Separation of domestic and hazardous waste at the source shall be strictly enforced. • Where possible, wastes will be re-used or recycled. • Burning of waste will not be permitted • All personnel will be trained in the appropriate management of waste according to the WMP.	• Monitoring of waste sources and disposal areas to ensure compliance with waste management procedures. • Record-keeping of waste generation volumes and collection/disposal schedules	• 100% disposal of wastes using approved methods stated in the WMP. • Storage and disposal of waste in designated, approved locations.	Daily	Embedded in project's operational costs	
Waste Oil Management	Waste oils generated by the project (vehicles and machinery) will be collected and stored in sealed containers and arrangements made with companies who can use them in their operations or manage their disposal.	• Monitoring of fuel storage areas for signs of oil contamination/ pollution and potential	Zero land or water pollution resulting from improperly handled waste oil.	Daily	Embedded in project's operational costs	

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
	-	sources of contamination/pollution. • Monitoring of waste oil storage and disposal methods for compliance with disposal procedures. • Record-keeping of waste oil generation volumes and collection/disposal schedules				
Emergency Response and Disaster Management	• Implementation of Emergency Response Plan, • Awareness raising among workers • Monitoring of potential situations leading to disaster.	• Identification of potentially hazardous conditions/ situations.	Fast and effective response to emergency situations.	• Monthly staff awareness programmes. • Periodic hazard inspections	**1,000**	Costing stated is to cover ERP training. Other measures are embedded in project's operational costs
Road Safety	• Community consultations and meetings on road safety issues will be carried out throughout the project • The road will be monitored for potholes or other defects which pose safety risks. • Road safety initiatives will be developed and implemented, including: - Ensuring that only qualified (licenced) drivers operate	• Inspection of roads for defects that could lead to accidents. • Monitoring of drivers' compliance with road safety requirements.	Zero accidents/incidents resulting from defective roads/traffic management measures	• Development of preventive road maintenance schedules • Efficient repair maintenance	**2,000**	Costing stated is for community consultations; other measures are embedded in project's operational costs.

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
	vehicles; - Implementing speed limits and traffic control measures in appropriate locations; - Implementing road safety signage; - Installing speed control devices such as governors on trucks			as needed • Monthly road safety consultations with communities		
Occupational Health and Safety	• Workers will be provided with all the required PPE. • Worker induction, followed by regular training on operational and safety issues will be conducted throughout employment • Toolbox talks will be carried out daily on safe work practices and other OHS issues. • First aid facilities will be available in all work areas • Medical facilities will be available to all workers.	Logging of all incidents and accidents, including details such as cause, remedial actions, preventative actions, etc	Zero incidents/accidents resulting in worker injury or fatalities.	Daily	Embedded in project's operational costs	
Gender Based Violence	• Promote female-friendly hiring and working conditions including the provision of separate toilet facilities for male and female workers, daylight working hours, well-lit spaces, etc. • Implement effective reporting and response mechanism for handling GBV complaints within the workforce and the project site community. • Develop GBV awareness programmes for communities through radio jingles, leaflets, posters, meetings, etc.	Logging of all GBV incidents and accidents, including details such as penalties levied against perpetrators, remedial actions, preventative actions, etc	Zero incidents of GBV within the workforce	Daily	Embedded in project's operational costs	

Monitoring Issue	Management Actions	Monitoring Actions	Monitoring Indicator	Monitoring Frequency	Quarterly Costs (USD)	Comments
Total Quarterly Budget during the Operational Phase					**6,000**	

8 SUMMARY AND CONCLUSION

8.1 Summary

This report is the second volume of addendums to the ESIA on the STL agro-processing project. It focuses on the management measures necessary to effectively eliminate or minimise impacts identified as likely to occur during the construction and operations of the fruit processing facility. It presents the environmental and social management, mitigation, monitoring and institutional measures to be taken during the project, to reduce adverse environmental and social effects to acceptable levels.

It serves as a broad project implementation guide in relation to environmental and social issues, and describes what actions must be taken and who is responsible to reduce Project impacts.

Project-related impacts will be generated mostly during the construction phase of the project. During this time, monitoring will need to be conducted daily in many instances, and weekly or monthly in others, for the duration of this phase. It is estimated that an effective management and monitoring of identified impacts during this phase will amount to USD 11,000 quarterly (USD 44,000 annually).

During the operations phase of the project, management and monitoring measures will need to be conducted throughout the project life, over periodic intervals (e.g. environmental measurements, community consultations, sensitization programmes for staff and communities, etc.). Management and monitoring of impacts during this phase is estimated at USD 6,000 quarterly (USD 24,000 annually).

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