



GOVERNMENT OF THE REPUBLIC OF LIBERIA

West Africa Agricultural Transformation Project-P164810



Environmental and Social Management Framework-ESMF

May, 2018

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ACRONYMS

ADA	Association of Agro-input Dealers
AfricaRice	Africa Rice Centre
ARCC	African and Latin American Resilience to Climate Change
AWP/B	Annual Workplans and Budgets
BOD	Biological Oxygen Demand
CAO	County Agricultural Officer(s)
CARI	Central Agricultural Research Institute
CEO	County Environment Officer
CERC	Contingent Emergency Response
CGAIR	Consultative Group on International Agriculture Research
CHAP	Community of Hope Agriculture Project
COD	Chemical Oxygen Demand
CORAF/WECARD	West and Central African Council for Agricultural Research
CSA	Climate Smart Agriculture
ESMU	Environmental and Social Management Unit
ECOWAS	Economic Community of West African States
EHS	Environment, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMPs	Environmental and Social Management Plans
ESMT	Environmental and Social Management Team
FBOs	Faith Based Organizations
GoL	Government of Liberia
GRM	Grievance Redress Mechanism
HIV/AIDS	Human Immuno Virus/Acquired Immuno Deficiency Syndrome
IFC	International Finance Corporation
ILO	International Labor Organization
IPM	Integrated Pest Management
IR	Inception Report
IRM/OM	Immediate Response Mechanism/Operational Manual
ISDB	Islamic Development Bank
IITA	International Institute for Tropical Agriculture
ITCZ	Intertropical Convergence Zone
LLA	Liberia Land Authority
LLAP	Liberia Land Administration Project
LASOP	Laboratory Standard Operating Procedures
LGRM	Local Grievance Redress Mechanism
M&E	Monitoring and Evaluation
MoA	Ministry of Agriculture
MoU	Memorandum of Understanding
MSME	Medium and Small Enterprises
NAIDAL	National Agro-Inputs Dealers Association, Liberia
OHS	Occupational Health and Safety
PAD	Project Appraisal Document

PCN	Project Concept Note
PCRs	Physical Cultural Resources
PCU	Project Coordination Unit
PDO	Project Development Objective
PEA	Preliminary Environment Assessment
PPD	Public Private Dialogue
PPMP	Pest and Pesticides Management Plan
PMU	Project Management Unit
PIU	Project Implementation Unit
RCoE	Regional Centers of Excellence
RPF	Resettlement Policy Framework
STAR-P	Smallholder Agricultural Transformation and Agribusiness Revitalization Project
STCRSP	Smallholder Tree Crops Revitalization Support Project
SoW	Scope of Work
TAAT	Technology for African Agricultural Transformation
ToRs	Terms of Reference
UNDP	United Nations Development Program
UNMIL	United Nations Mission in Liberia
USAID	United States Agency for International Development
VMGF	Vulnerable and Marginalized Group Framework
VOC	Volatile Organic Compounds
WAAPP	West Africa Agricultural Productivity Project
WAATP	West Africa Agricultural Transformation Project
WBG-EHS	World Bank Group Environment, Health and Safety

PROJECT DESCRIPTION

The proposed West Africa Agricultural Transformation Project (WAATP) will be one of the major projects that support the IDA 18 Business Plan for West Africa. The Project will contribute to scaling up the WAAPP achievements, while going beyond the WAAPP objective of increasing productivity by addressing use of a more holistic and broader issues of accelerating regional food availability in terms of both quantity and quality. The project will also contribute towards building enhanced agricultural impact with other regional agricultural projects financed by other institutions such as African Development Bank's (AfDB) financed Technologies for African Agricultural Transformation (TAAT), the Islamic Development Bank's (IDB) regional agricultural development program.

Project Development Objective-PDO

The PDO is to accelerate adoption of agricultural improved technologies and innovations by small scale producers and contribute to improve enabling environment for regional market integration in the ECOWAS region and enable the Governments to respond promptly and effectively to eligible emergencies.

PROJECT COMPONENTS AND ACTIVITIES

The project will have the following components:

Component 1- Strengthening the new model for innovation development in West Africa: This component will support: i) provision of additional infrastructure, equipment and grants for research activities for the RCoE (climate smart technologies, nutrition including bio fortification, soil health, etc.)

Component 2- Accelerating large-scale adoption of improved technologies and innovations: The component aims at scaling up adoption of improved agricultural technologies and innovations improving promoting innovation for youth that will accelerate productivity increases and thus contribute to higher food availability in the sub-region and enhanced regional trade flows.

Component 3- Policies, markets and institutional strengthening: The component is to create the enabling policy environment to accelerate agricultural transformation, connect production to markets and strengthen regional integration institutions.

Component 4. Contingent emergency response: This component, known as the Contingent Emergency Response Component (CERC), will be put in place should the need arise to redirect some of the project resources to contribute with other projects in the participating countries portfolio to respond to an eligible emergency or crisis. An Immediate Response Mechanism Coordinating Agency and expenditure management procedures will be defined in an Immediate Response Mechanism Operational Manual (IRM/OM), to be prepared separately and approved by the World Bank.

Component 5. Project management, learning, monitoring and evaluation: The Project will be coordinated: at the national levels by existing national Coordinating Units, which successfully coordinated the implementation of WAAPP; and (ii) at the regional level by CORAF based on a well-defined mandate agreed by the Regional Steering Committee (RSC). This component aims to ensure that the project is efficiently managed and performance and impact are carefully tracked.

OVERVIEW OF MAJOR ENVIRONMENTAL AND SOCIAL RISKS IN THE PROJECT

- a. **HIV/AIDS concerns:** Implementation of works will likely attract labourers to the project areas which can trigger HIV/AIDS concerns and it is proposed that, the project will work with nearby HIV/AIDS service providers to provide counselling and supply of condoms to the workers at agreed terms with the project contractors;
- b. **Risks in the management of asbestos roofs on staff houses in CARI:** It is observed that, some of the staff houses in CARI have asbestos roofs a hazardous material. This ESMF under has prescribed measures to safe removal, handling and disposal of asbestos materials in keeping with World Bank Group EHS Guidelines as well as WHO Guidelines on handling of asbestos;
- c. **Risks of public intrusion to the sites:** There are risks of the public and unauthorized persons to enter the sites works where rehabilitation is being undertaken can have its own impacts on the progress and execution of works as well as theft of construction materials. This is to be checked through securing the site and posting signs that keep off the public from accessing the sites;
- d. **Construction waste management risks:** Solid waste will likely be generated at the site during site preparation and rehabilitation phases and such waste can consist of timber or metal cuttings, excavated materials, paper/cement bags, empty paint and solvent containers, broken glass among others. Construction waste will be managed through proper site clearance and restoration;
- e. **Risks associated with management of obsolete laboratory and workshop equipment:** Rehabilitation of the laboratories and workshops at CARI will likely generate some obsolete equipment upon acquisition of state-of-art technologies. The disposal of such obsolete equipment can be an environmental hazard. However, where some of the equipment is usable, it will be availed to small agricultural research entities and some can be disposed in accordance with Amended and Restated Public Procurement and Concessions Act, 2005.
- f. **Risks associated with construction traffic movement:** Traffic impacts will likely relate to transportation of construction materials to the site and ferrying out of construction wastes which will likely generate dust emissions and have impact on the work environment in the laboratory and workshop areas. The contractors will screen off the worksites inside the facilities and on the access routes to the institutes, the drivers have to observe speed limits.
- g. **Occupational health safety (OHS) Risks for the project workers:** Construction activities have potential to pose occupational risks such as fatal falls if workers do not use safety latches when working at heights and associated risks. It is proposed that, workers be provided with appropriate personal protective equipment (PPE) for their safety while on sites;
- h. **Borrow pits risks:** Construction materials for use in the rehabilitation works will likely be sourced locally from traders i.e. bricks/blocks, fill-materials and stones will be from existing suppliers as such, no need for restoration of extraction sites by the project. The County Environment Officers will monitor to see that such areas are restored by those who are engaged in extraction of such materials;
- i. **Disposal of excess construction waste:** Excess construction waste material which will not be re-usable will be disposed into areas and in a manner acceptable to Country Environment Officers in respective areas, EPA and the PIU;
- j. **Risks of vegetation loss:** The contractor will bring to the site equipment necessary for carrying out the works and ensure proper safeguards to prevent excess and un-wanted loss of vegetation and soil erosion. In addition, the pathways/access routes have to be managed in accordance with sound environmental practices and such sites will be fully restored to the satisfaction of County Environment Officers (CEOs), EPA and PIU;
- k. **Non-payment of workers:** Payment of salaries and wages is sometimes of concern on sites and it is proposed that, workers be issued with contracts before commencement of work;
- l. **Issues of child labour:** To address this risk, there should be no engagement of children below ages of 18

years on the project sites. Any contractor with such practice will have his/her contract terminated since such a practice compromises and contradicts both the ILO Employment Convention as well as the Liberian Education and Children Act;

- m. **Concerns over handling of agro-pesticides:** Scaling up of soil fertility management including soil mapping, soil testing, and fertilizer blending will call for application of agro-pesticides hence, a need for a stand-alone pest management plan for WAATP in this project.

POLICY, LEGAL AND INSTITUTIONAL REQUIREMENTS

This outlines in summary, policy, legal and institutional framework and procedures WAATP project will comply with as follows:

Policy Framework

The applicable policy instruments include:

- a. **National Environment Policy of Liberia (2002):** Whose policy goal is to ensure long-term economic prosperity of Liberia through sustainable social and economic development, which enhances environmental quality and resource productivity on a long-term basis;
- b. **Land Administration Policy, 2015:** This policy presents a framework for land administration in Liberia and focuses on the main features of good land administration and those pertaining to the identification, ownership, use and valuation of land amongst others;
- c. **Land Rights Policy (2013):** provides the Land Commission's policy recommendations for land rights in Liberia and centered on basic types of rights;
- d. **The National Rice Development Strategy of Liberia (Republic of Liberia 2012a):** Aims to improve food security and achieve self-sufficiency through the doubling domestic rice production by 2018; and
- e. **National Environmental and Occupational Health Policy, 2010:** this policy is focused on the ensuring the working conditions in major work places are safe and healthy for the workforce for the purpose of protecting and promoting health in the workplace for all workers.

Liberian legal framework

The applicable legal instruments from the national perspective include:

- a. **The current Constitution of Liberia 1986:** Article 7 of the Constitution obliges the state to manage the national economy and the natural resources in such manner ensuring that, the citizens enjoy maximum benefit so as to advance their general welfare and the economic development of Liberia;
- b. **Environmental Protection Agency (EPA) Act, 2003:** creates the EPA as the principal authority in Liberia for the management of the environment and shall co-ordinate, monitor, supervise and consult with relevant stakeholders on all activities in the protection of the environment and sustainable use of natural resources; and
- c. **Environmental Protection and Management Law, 2003:** The law addresses a wide range of environmental issues including environmental impact assessment amongst others in development projects.

World Bank Safeguard Policies

The World Bank Environmental and Social requirements to borrowers which are applicable to the project include:

- a. **OP 4.01 Environmental Assessment:** infrastructure refurbishing and rehabilitation in CARI and participating agencies which will involve construction works hence, triggering this safeguard policy which will necessitate some level of Environmental Assessment;

- b. **OP 4.09 Pest Management:** Agricultural transformation will be aiming at improved production and productivity as such, usage of agro-pesticides is envisaged which will trigger this safeguards policy and has necessitated preparation of a PPMP alongside this ESMF; and
- c. **OP 4.12 Involuntary Resettlement:** The project will not undertake any activities that will displace people. Farmers who will be involved in the project will have interventions on their lands hence, minimal uptake of peoples' lands is envisaged. While these interventions are yet to be identified, a separate Resettlement Policy Framework is being prepared as part of the project environmental and social safeguards preparation process.

Risks during laboratories and workshops operations

Once rehabilitated and operational, the following negative impacts are anticipated:

- a. **Waste to be disposed by a contracted waste handler:** The laboratories are to have separate bins for separate waste and should be disposed by a contracted service provider in accordance with a given type of waste at hand.
- b. **Incineration:** All other laboratory waste will be segregated and hazardous ones will be disposed through incineration. It is proposed that, WAATP needs to support construct an incinerator for CARI as part of the support;
- c. **Misuse and inability to operate installed equipment:** There can be risks of laboratory staff abusing the equipment and reagents which has comes with economic implications on the costs operations. This is already addressed through having in place, Standard Operational Procedures for any investigations, training and re-training and ensuring staff operate under hierarchy of supervision and accountability;
- d. **Risks of fires:** Risks of fires in laboratories can be occasioned through spillages, irresponsible storage, handling and application of inflammable reagents, irresponsibly carrying around naked flames, smoking cigarettes and faulty electricity connections. There should be fully functional fire extinguishers laboratory staff be trained on their operations alongside rescue drills;
- e. **Management of reagents spills:** laboratories to adopt strategies for managing reagents spills as part of their Standard Operating Procedures (SOPs). When a spill occurs, the area is cleared of any users, and the spill cleaned up immediately; and
- f. **General procedure for disposal expired reagents:** CARI should put in place, a standard protocol in place for the management and disposal of expired and obsolete reagents and should be applicable to all laboratories and screen houses operations: routinely checking and preparing a list of materials which have/are near expiry; filling a disposal form with details of the expired reagent and handing over the reagents to the appointed disposing agent.

Environmental and social risks of in operations of poultry and piggery-based enterprises

- a. **Impacts relating to odors:** Poultry and piggery facilities are a source of odor and attract flies, rodents and other pests that create local nuisances and carry disease. Odor emissions, caused by a large number of contributing compounds including ammonia (NH₃), volatile organic compounds (VOCs), and hydrogen sulphide (H₂S), from poultry farms can affect the life of people living in the vicinity as such, poultry enterprises ought to observe strict hygienic conditions;
- b. **Risks of vectors nuisance:** Flies are of concern for residents living near poultry and piggery facilities. There are reports that, residences in close proximity to poultry and piggery facilities equally suffer health impacts arising from nuisance by flies and mosquitoes emanating from such enterprises because dampness due to poor handling of water and poor drainage. Flies nuisance is largely due to the poor handling and management of animal-feeds and associated waste in the pens which can be addressed through observation of good hygiene in the enterprises and extension services support;

- c. **Management of waste water from poultry and piggery farms:** Significant environmental issue relating to poultry and piggery farms result from slaughterhouse operations and discharge of wastewater into the environment as such, waste from poultry and piggery farms need to be properly monitored and managed; and
- d. **Management of diseased and dead animal carcasses:** Operations of poultry and piggery enterprises can have challenges of managing sick, or dead pigs and poultry and such have to be managed through isolation, immediately burying dead animals and ensuring all workers in the farms to have changing rooms where they thoroughly clean up before and after work to avoid carrying disease agent to animals and, to the communities.

Risks associated with agro-processing and value addition investments

- a. **Generation of crop-based wastes:** This intervention will generate a range of waste including husks from rice and cassava peelings which if not well managed can turn to be a public health risks to the communities. In most rice hullers in rural areas of Liberia there are heaps of rice husks which farmers try to dispose through burning which adds to carbon emissions generation. Rice husks can be used to make briquettes for fuel which is already underway by CHAP a local NGO;**Risks of food insecurity at household levels:** Industrialization and commercialization of the commodity crops will have economic benefits at household and national levels and no doubt, increase income at household levels. However, this must be balanced in such a way that, households don't focus on industrial market at expense of household food security; and
- b. **Preparation of Environmental Assessments-EAs:** Once industrial/value addition plans for the WAATP commodities are fully finalized, it is recommended that; developers of such ventures conduct appropriate and independent Environmental Assessments in relation to the products being developed i.e. nature of enterprises and their operations and such Assessments will be subjected to the EPA Approval procedures.

PUBLIC CONSULTATIONS

Stakeholder consultations were undertaken during the preparation of the ESMF in the period of 18th-26th March 2018. The public consultations involved meetings with the client at the PIU to agree on the consultations road map and salient issues of discussions during the meetings. Meetings were held the officials from Ministry of Agriculture (MoA), World Bank Senior Social Safeguards Specialist, the research scientists from International Institute for Tropical Agriculture (IITA), farmers groups, private sector actors especially National Agro-Dealers Association of Liberia (NADAIL) and NGOs all in Monrovia city. Other meetings were held with farmers in rural areas in Bomi, Margibi and in Lofa. A summary of persons met is shown in annex to this ESMF.

During the consultations, some of the key stakeholder concerns from the consultation meetings included the need for research on pests and diseases affecting rice, reporting on the environmental compliance of the project during its implementation, need to streamline importation and oversight role on agro-chemicals. Other issues included the need to put in place measures for ensuring farmers are involved in climate smart agriculture in view of increasing climatic variability. Post-harvest measures and value addition, will improve earnings from agricultural enterprises under WAATP. It is also evident that, capacity needs ought to be addressed in the PIU for effective mainstreaming of cross-cutting themes into the project activities and plans amongst others.

Managing stakeholders and communication

For purposes of managing information during the project phases, it is important that, regular communication with all project stakeholders is established and managed in order to continue to meet their needs and manage expectations. As such, WAATP could have a clear communication plan from its start. This will identify what the

different stakeholders need to know; the best way of informing them and how often this will happen. The circulation of WAATP reports will equally be key to a useful way to communicate successes, risks, issues, change requests, and updates on project deliverables, timeline and budget.

At its end/closure phase, such a process should be formally and logically brought to an end and signed off by the Project Steering Committee and the Bank. To do this a final report will be completed with the help of the PIU, and then circulated to the PMU, the Bank and EPA (for ensuring environmental and social compliance observance in the project). It is suggested that, any safeguards materials generated during the project could be handed over to GoL (MoA or EPA) as shall be applicable. The environmental and social safeguards results, any recommendations and lessons learnt from the project should also be disseminated to appropriate organizations/networks including EPA.

Where feasible, the project could be subjected to a post project review process, with your partners and where that is done, its environmental and social compliance aspects could form part of such a process specifically, assessing its benefits, successes, any issues and failures, and if the aims and objectives of the project were met within the timescales and on budget and such information could be shared with MoA and will be helpful in formulation of subsequent projects.

CAPACITY BUILDING

In order to ensure successful delivery of the project, including the mitigation and improvement measures, it will be necessary for the PIU amongst others, to strengthen both its own capacity to guide the environmental and social safeguards processes, that of its participating agencies and the beneficiary communities to sustainably achieve the project objectives. Involvement of the stakeholders at key stages in the development and operation will be a key factor in avoiding risks of non-compliance which could jeopardize the project development objective in the long run. Therefore, the PIU will appoint two specialists viz; an Environmental and Social Development Specialists who will be responsible for steering and playing oversight role regarding compliance of the project with both GoL environmental requirements as well as those of World Bank.

These appointees would be the point of contact for all issues related to environmental and social impact management of project initiatives and activities. One of the two Specialists would be designated as an Environmental Manager and is to responsible for official liaison with the EPA and participating line agencies and the Bank. Similarly, an Environmental Officer in the target counties will be responsible for day to day issues arising from project implementation. Where there is no County Environment Officer, it is suggested that, the County or District Agricultural Officers be designated to oversee environmental and social safeguards in the project. Collectively these officials will be the project's Environmental and Social Management Team (ESMT) coordinated in the PIU.

Each member of the project management team will be responsible guiding conformity with applicable laws and regulations, and for conducting their work responsibilities in accordance with permit requirements and the ESMP. The environmental management controls that should be used at each of the project development locations to assist in meeting the overall environmental management objectives for the project should include, but not be limited to:

- a. Environmental Awareness Training: Awareness and sensitization need to be conducted for project management staff to give hints on key safeguards aspects such as environmental screening, formulation of ESMP, environmental monitoring and compliance reporting;

- b. Awareness on the project social mainstreaming: these should address awareness and sensitization covering HIV/AIDS and gender mainstreaming, mainstreaming occupational health and safety and issues of child labour in the project works, workers' rights and privileges in line with the national labour requirements, issues;
- c. Sensitization on the preparation and implementation a stakeholder engagement plan, inform all communities affected by the project on its implementation schedule, available job opportunities, information on project need to access local construction materials in the communities;
- d. Sensitization on identification and assessment of environmental and social risks in the project including those related to gender, climate change and vulnerability; and
- e. Environmental compliance inspections: involvement and role and how to involve project safeguards monitoring and reporting.

It is important that the ESMT meet regularly and as frequently as necessary to coordinate prompt reaction to arising issues, evaluate data from the monitoring program and assure efficient implementation of the ESMP. A representative of the EPA should be invited to attend these meetings as well as representatives of other supporting agencies when appropriate (e.g. when specific expertise is required).

GRIEVANCE REDRESS MECHANISM

The Grievance Redress Mechanism (GRM) will provide a way to provide an effective avenue for expressing concerns and achieving remedies for communities. The goal is to promote a mutually constructive relationship and enhance the achievement of project development objectives. The GRM is to ensure that complaints are directed and expeditiously addressed by the relevant agencies which is to enhance responsiveness and accountability. While a project-specific feedback and complaints mechanism is set up, the WAATP will incorporate the existing grievance mechanism that uses the chieftdom-based approach in areas of the project.

Some of likely grievances in WAATP implementation areas could include; abuse or improper use of pesticides, non-payment of workers employed in the project, non-payments for construction materials to be used on infrastructure sub-components, issues relating to access and discrimination in employment opportunities offered by the projects activities, and encroachment on neighbors' lands during project implementation amongst others.

Furthermore, the grievance mechanism should be accessible to all members of the community including vulnerable groups such as girls and women who are vulnerable to sexual harassment by project workers, clear and transparent avenues for the submission of grievances that guarantees one's privacy. In the complaint resolution, the Implementing partners should to the extent feasible, use existing complaint and resolution mechanisms, including informing the PCU about serious concerns/complaints and involve them in the resolution, if appropriate. All grievances should be logged in a complaint register to assess whether the grievance is closed or whether further action is needed.

A verbal or a written complaint from aggrieved person will be received by the Project Manager or a person assigned in the project as the Grievance Officer (GO) and recorded in a grievance log (electronically if possible). Grievances can be lodged at any time, either directly to the Contractor, Sub-county/District Office or via the grievance committee member.

The process for lodging a complaint is outlined below:

- a. The GO will receive a complaint from the complainant;
- b. The GO will ask the claimant questions in their local language write the answers in English and enter them

- in English onto the Grievance Form;
- c. A representative of the community shall witness translation of the grievance into English;
- d. The GO reads the complaint in English and translates it into the complainant's local language on the Grievance Form;
- e. The local leader and the complainant both sign the Grievance Form after they both confirm the accuracy of the grievance; and
- f. The GO lodges the complaint in the Grievance Log.

Local grievance redress committees (LGRC) will be initiated at the village level to record grievances and also help in mediation. This committee will comprise the area local chief or a trusted village elder, a religious representative, and specific vulnerable group representatives of relevance to the village i.e. women and the disabled. Disputes will be resolved at the village level as far as possible. The GRC at the district and county levels will be resolved under a County/District GRM constituted by the Project. At the County Level, the Grievance Redress Committee will be established to deal with any grievances unsettled at the village level. More serious grievances must immediately be referred to the police. It is important to note that, not all conflicts and grievances in the project are to be concluded under WAATP GRM. More serious cases that involve assault, gender-based violence, rape and "serious" theft will not be resolved under this framework but are instead referred to the police for appropriate prosecution process.

MONITORING INDICATORS

To trace implementation compliance of the project, it is proposed that the following indicators be employed to check levels of project compliance.

These are:

- a. Safe removal and disposal of asbestos roof sheets;
- b. Measures for disposal of construction wastes;
- c. Provision and usage of personal protective equipment by workers;
- d. Evidence of workers trained in the safe use, handling, storage, and disposal of agrochemicals; and
- e. HIV/AIDS awareness sensitization

ESMF IMPLEMENTATION ARRANGEMENTS

The project will entrust the regional coordination activities to CORAF and the country level activities to existing project units. It will be coordinated: (i) at the national levels by the existing national implementing unit which successfully coordinated the implementation of WAAPP; and (ii) at the regional level by CORAF based on its well-defined mandate agreed by the Regional Steering Committee (RSC) under the Annual Work Plan and Budget (AWP&B). Under the Project Management Component whose aim is to ensure that the project is efficiently managed with its performance and impacts carefully tracked. The Project Management Component will support annual foresight conferences to monitor trends in the sector and emerging needs, training of national counterparts to contribute to the analytical work, regular monitoring by the Agricultural Science and Technology Indicators group (ASTI) of CGIAR. CORAF will also be strengthened by establishing a small regional coordination unit with key staff. The staffing of CORAF and each PIU will include a social safeguard/gender specialist, an environmental safeguard/climate change specialist, a private sector specialist, a communication specialist, an M&E officer, the fiduciary staff (Procurement and Financial Management), the Project coordinator and at least one technical expert.

ESMF BUDGET

Financial resources are required to support implementation of the ESMF are shown below though they indicative and can be confirmed during Project Appraisal Process. Costs for any aspects of compensation are in the Resettlement Policy Framework for the project which was being finalized the time of this ESMF.

Indicative ESMF Budget for WAATP

Nº.	Item/Activity	Cost in USD
01.	Costs of employing two Safeguards Specialists in the PIU for 5 years	336,000
02.	Capacity building for Counties and District Environment inspectors	75,000
03.	Cost of an incinerator at CARI	25,000
04.	Equipping and support operationalize the Safeguards Unit in the PIU (5 years)	125,000
05.	Preparation of EA documents for future sub-projects.	45,000
06.	Mainstreaming HIV/AIDS (5 yrs) ¹ .	50,000
07.	Technical backstopping (Safeguards Consultants to the PIU Unit)	60,000
08.	Safe disposal of asbestos roof sheets	5,000
09.	Environmental Audit of WAATP	55,000
Total Budget Estimate for ESMF Implementation		776,000

OTHER SAFEGUARDS TOOLS UNDER WAATP

Apart from this ESMF, other safeguards documents prepared include:

- Resettlement Policy Framework: this is in place to guide land acquisition process in the project where and when such need to acquire land for the project development or its infrastructures arises;
- Pest Management Plan: to guide control of pests and diseases during the implementation of the project; and
- Grievance Redress Mechanism which is in the ESMF for purposes of managing potential grievances that could arise in the project. It is important to note that, the GRM does not replace conflict/justice mechanisms are already in places of the project but it is expected to handle issues/conflicts that are typical to the project.

ESMF DISCLOSURE

The disclosure is a requirement from the World Bank safeguard policies as well as from national environmental assessment procedures, and therefore the report will be available to project affected groups, local NGOs, and the public at large. The PIU will make copies of the ESMF available in selected public places as required by law for information and comments as well as in the media. The ESMF will be announced and published on an official Government website. EPA and PIU/MoA will upload the ESMF and other safeguards for WAATP onto its website <https://www.moa.gov.lr/> and invite the public to access and review the documents. The PIU will also provide copies of the ESMF, PPMP, RPF and other safeguards documents in the project to the public in its Secretariat, CORAF and at CARI from where the public can access it for any comments. The ESMF, PPMP& RPF alongside other safeguards documents will be disclosed at the World Bank's website and made available to any interested persons for public access and for public information and comments/feedback as will be necessary.

¹ Proposed a service provider to conduct HIV/AIDS awareness sensitization on work sites and distribution of condoms

1 INTRODUCTION

1.1 DESCRIPTION OF THE WEST AFRICAN AGRICULTURAL PROJECT-WAATP

The proposed West Africa Agricultural Transformation Project (WAATP) will be one of the major projects that support the IDA 18 Business Plan for West Africa. The Project will contribute to scaling up the WAAPP achievements, while going beyond the WAAPP objective of increasing productivity by addressing use of a more holistic and broader issues of accelerating regional food availability in terms of both quantity and quality. The project will also contribute towards building enhanced agricultural impact with other regional agricultural projects financed by other institutions such as African Development Bank's (AfDB) financed Technologies for African Agricultural Transformation (TAAT), the Islamic Development Bank's (IDB) regional agricultural development program.

The WAATP will build on the existing initiatives (deep dive activities) between the Bank, AfDB and ISDB to foster more effective collaboration in the agriculture sector. Several mechanisms will be put in place to ensure strong synergy between Bank regional programs and national projects including joint implementation support missions, joint annual work programs and budgets, memoranda of understanding outlining collaboration areas. The coalition for more impact will also rely on a different set of instruments, including the regional technology market and national and regional technology fairs, exchange visits and MOUs. WAATP will also build a more structured coalition with the CGIAR institutions to speed adoption of CGIAR technologies at a large scale through MoUs with the RCoEs. A task force composed of task team leaders of regional projects of AfDB, ISDB, USAID, AGRA and any other relevant institution will be set up and meet yearly to discuss synergies and common programs.

1.2 PROJECT DEVELOPMENT OBJECTIVE-PDO

The PDO is to accelerate adoption of agricultural improved technologies and innovations by small scale producers and contribute to improve enabling environment for regional market integration in the ECOWAS region and enable the Governments to respond promptly and effectively to eligible emergencies.

1.2.1 PROJECT COMPONENTS AND ACTIVITIES

The project will have the following components:

1.2.1.1 COMPONENT 1- STRENGTHENING THE NEW MODEL FOR INNOVATION DEVELOPMENT IN WEST AFRICA

The component aims to continue to enhance regional linkages between and among national research entities, strengthen the National Centers of Specialization (NCoS) supported under WAAPP, and upgrade them to become ECOWAS Regional Centers of Excellence (RCoE) focusing on priority lines of research to be addressed regionally. The RCoE will play a key role in ensuring a solid link with the CGIAR research system, the private sector and the networking of national agricultural research and extension systems to deliver, in a sustainable manner, improved technologies and innovation - which will be screened to ensure that they are climate smart and gender sensitive - for scaling up.

This component will support: i) provision of additional infrastructure, equipment and grants for research activities for the RCoE (climate smart technologies, nutrition including bio fortification, soil health, etc.) including an assigned division of labor for participating countries; ii) capacity building of the RCoE network institutions in the participating countries in the domain of adaptive research; iii) academic training for the next generation of scientists and for research technicians; iv) MoUs with the CGIAR centers and other advanced research institutions for capacity building, technical backstopping, joint research activities and dissemination of CGIAR technologies; v) establishment of a Center of Excellence for Mechanization that would support a new model of

mechanization for West Africa including the promotion of zero tillage, private sector led mechanization, and private mechanization service centers; vi) annual planning and result-sharing workshops organized by each RCoE; vii) participation of the research system in the development of Innovation Platforms; and vii) grants to best skilled research teams to develop and adapt technologies for priority research areas which focus on constraints along the targeted value chains.

1.2.1.2 COMPONENT 2- ACCELERATING LARGES-SCALE ADOPTION OF IMPROVED TECHNOLOGIES AND INNOVATIONS

The component aims at scaling up adoption of improved agricultural technologies and innovations improving promoting innovation for youth that will accelerate productivity increases and thus contribute to higher food availability in the sub-region and enhanced regional trade flows.

1.2.1.2.1 SUB-COMPONENT 2.1. DEMAND-DRIVEN MARKET-BASED MASS ADOPTION OF TECHNOLOGIES AND INNOVATIONS.

The sub-component aims to address the key drivers of productivity increase and accelerate mass adoption of innovations. The sub-component will further consolidate activities already initiated under WAAPP including: i) implementation of a regional knowledge management and communication for development action plan to address information needs of farmers and value chain actors; ii) strengthening of national private and public extension services and their networking at regional level; iii) scaling up the use of ICT and innovations in outreach, such as E-extension, E-vouchers, electronic technology markets, regional geo-spatial monitoring of technology adoption, innovative rural finance tools; iv) promotion of multi stakeholder platforms, such as Innovation Platforms and alliances with the private sector and farmers' organizations as conduits for new technology mainstreaming; v) upgrading the national seed systems and regional seed market; v) scaling up of soil fertility management including soil mapping, soil testing, and fertilizer blending; vi) promotion of south-south collaboration with other sub regions in Africa as well as with Asia, and Latin America; vii) national and regional technology fairs and events and viii) the implementation of an action plan to promote nutrition-sensitive agriculture and technologies.

It will also support new activities related to: i) promotion of mechanization services to farmers; ii) piloting and scaling up of innovative rural finance models in collaboration with IFC, T&C and commercial banks including leasing for mechanization, inventory credit schemes, risk sharing facilities; x); and iii)

1.2.1.2.2 SUB-COMPONENT 2.2: INNOVATION FOR YOUTH

The sub-component aims at scaling up adoption of innovations and improved technologies by the educated and non-educated youth who are already in the rural area or showing a great interest in the agricultural sector. The project would specifically target youth in the range of 18-35-years, and work with them to improve their skills in agricultural production, services to agriculture, value addition. The sub-component will scale up activities piloted under WAAPP including: i) development of a regional strategy and national action plans for youth employment in the agricultural sector based on the outcome of the ongoing stocktaking exercise of pilot activities initiated under WAAPP ; ii) specific vocational capacity training for youth and scaling up of public and private sector led incubation systems/hubs/centers (such as the Ibadan University and IITA ones, the WAAPP experiences); iii) networking of youth entrepreneurs, business plan competition and development of a mentorship program at national and regional levels and iv); and iv) start up and kits to support innovation adoption by youth.

1.2.1.3 COMPONENT 3- POLICIES, MARKETS AND INSTITUTIONAL STRENGTHENING.

The aim of this innovative component is to create the enabling policy environment to accelerate agricultural transformation, connect production to markets and strengthen regional integration institutions. Efforts will be focused on removing barriers to cross-border trade in technologies and inputs, identifying products for which

regional demand is growing, and strengthening the institutions at the regional level to provide backstopping for the reform process.

1.2.1.3.1 SUB-COMPONENT 3.1: REGIONAL POLICIES AND REGULATIONS.

The sub component will consolidate activities launched under WAAPP and address new areas of policy reforms necessary to accelerate agricultural transformation in the sub-region. It will support: i) stocktaking of the implementation of the regional regulations on seeds, pesticides, fertilizer and veterinarian products and implementation of the resulting action plan, building on existing regional initiatives and effective implementation at the country level; ii) updating and implementation of the existing common strategies and action plans for gender, communication, climate change The sub-component will also focus on new areas including: i) support to regulatory reform and increased coordination to address non-tariff barriers to regional trade ii) review of the regional trade policies and development of an action plan for their update and/or dissemination to value chain actors.

1.2.1.3.2 SUB-COMPONENT 3.2: REGIONAL MARKET DEVELOPMENT FOR TARGETED PRODUCTS.

This sub component aims to identify products for which regional demand is growing rapidly, and for which potential exists to increase trans-border trade flows A selected number of products (2 or 3) will be identified, based on experience, in the main trade corridors and will be used to test the business environment and provide feedback for scale up. The sub-component will therefore support: i) establishment and operationalization of regional multi-stakeholder initiatives – Public-Private Dialogue (PPD), trade knowledge platforms, regional Innovation Platforms- to identify key bottlenecks and support collective action and advocacy; ii) preparation and implementation of detailed action plans to implement proposed solutions for identified barriers in value chains that inhibit cross-border flows of technologies and/or products; a positive list of eligible activities will be identified during preparation; iii) the continuing monitoring of trade-flows of these commodities along the main trade corridors, identifying the main legal and illegal barriers and practices hindering trade and increasing the transaction costs between farms and forks and ; iv) south-south exchange visits with SADC and the East African Community; and v) feasibility studies for regional warehouse receipt system and a private sector-driven regional commodities exchange market. It will furthermore explore collaboration with IFC to pilot innovative schemes including “risk sharing facility” and “business plan competition” to facilitate access to investment capital and support to the best investment projects.

1.2.1.3.3 SUB-COMPONENT 3.3: STRENGTHENING THE CAPACITY OF REGIONAL AND NATIONAL INSTITUTIONS.

The sub-component would strengthen the capacities of the regional institutions responsible for leading and coordinating the definition of regional policies, strategies and programs for agricultural development. It would support activities aimed at: i) strengthening the capacities of ECOWAS, ECCAS and WAEMU respective Departments of Agriculture in policy analysis, regional programs preparation, implementation and monitoring, regional benchmarking and impact evaluation; ii) strengthening/clarifying the relationships between these regional institutions and regional technical agencies such as CORAF and CILSS; (iii) strengthening CORAF capacity to implement programs identified by ECOWAS/WAEMU in the areas of technology generation and dissemination; and iv) building the capacities of national Ministries and relevant institutions (including producer associations, Inter-professional bodies, private sector and civil society organizations) to implement the national projects under WAAPP including for policy and regulations design, upgrading/modernizing agricultural research and extension systems, designing programs for increasing access to inputs and credit, monitoring and evaluation of programs and reforms.

1.2.1.4 COMPONENT 4. CONTINGENT EMERGENCY RESPONSE

This component, known as the Contingent Emergency Response Component (CERC), will be available should the need arise to redirect some of the project resources to contribute with other projects in the participating countries portfolio to respond to an eligible emergency or crisis. The available resources would be made available to finance emergency response activities and to address crisis and emergency needs. An Immediate Response Mechanism Coordinating Agency and expenditure management procedures will be defined in an Immediate Response Mechanism Operational Manual (IRM/OM), to be prepared separately and approved by the World Bank, in line with guidance provided under OP 10.00, paragraph 11. In case this component is to be used, the project will be restructured to allocate financing.

1.2.1.5 COMPONENT 5. PROJECT MANAGEMENT, LEARNING, MONITORING AND EVALUATION.

The Project will build on the successful institutional arrangements mechanisms of WAAPP. It will be coordinated: (i) at the national levels by existing national implementing units (PIU), which successfully coordinated the implementation of WAAPP; and (ii) at the regional level by CORAF based on a well-defined mandate agreed by the Regional Steering Committee (RSC) under the Annual Work Plan and Budget (AWP&B). This component aims to ensure that the project is efficiently managed and performance and impact are carefully tracked. The component would also support annual foresight conferences to monitor trends in the sector and emerging needs, training of national counterparts to contribute to the analytical work, regular monitoring by the Agricultural Science and Technology Indicators group (ASTI) of CGIAR and national counterparts of expenditure on R&D, measurement of productivity, monitoring of jobs created and project management, and impact analysis. CORAF will be strengthened by establishing a small regional coordination unit with key staff. The staffing of CORAF and each PIU will include a social safeguard/gender specialist, an environmental safeguard/climate change specialist, a private sector specialist, a communication specialist, an M&E officer, the fiduciary staff (Procurement and Financial Management), the Project coordinator and at least one technical expert. The Environmental and Social Management Framework.

1.3 PREPARATION OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

1.3.1 PURPOSE OF ESMF

Because specific projects to be prepared using WAATP funds will only be fully identified after completion of the project appraisal document (PAD), an Environmental and Social Management Framework (ESMF) is deemed necessary to give an overall guide on how potential environmental and social issues in the project are to be addressed. The purpose of this ESMF is to ensure that, anticipated key environmental and social risks and impacts in the project are flagged such that, subsequent preparatory studies in this project take cognizance of them and mainstream them as part of the thematic preparation requirements and obligations.

It also identifies measures to avoid and minimize environmental and social impacts, as much as possible, and where they cannot be avoided, the impacts are adequately identified/assessed and necessary mitigation measures designed and implemented following relevant Government of Liberia (GoL) environmental and social legislations and the World Bank's safeguards policies.

In this case, the future implementation of WAATP sub-projects to be prepared and funded will be subject to the processes defined in this ESMF. The ESMF further defines how safeguards will be taken into account and managed for all project activities that may have safeguards requirements, including feasibility studies and non-PPP transaction activities. During implementation of the project, project activities with potential safeguard issues will be screened to determine the scope and types of safeguards instruments that would be required.

Depending on the activities, appropriate environmental assessments will be undertaken in consultations with EPA and World Bank. It is important to note that, there will be no need for a full environmental assessment taking into account, the current scope of proposed project activities which make WAATP to be a category B type (i.e. projects whose impacts are largely small-scale, localized and of short-term nature).

To ensure that transactions with investors include relevant measures to safeguard the environment and minimize the potential for negative social consequences, the ESMF is to be part of contractual documents for implementing transactions for which WAATP funds will be used to help prepare.

This ESMF identifies the responsibilities of project stakeholders, procedures for environmental and social safeguards screening, review and approval, monitoring and reporting requirements, as well as plans to enhance institutional capacity. It also offers sample terms of reference for carrying out environmental impact assessments (EIAs) amongst others. It also serves as an environmental and social safeguards instrument to provide the framework to both the relevant government agencies and private partners for preparing and implementing infrastructure projects.

1.3.2 ESMF PREPARATION METHODOLOGIES

In the preparation of the ESMF for WAATP, the processes below were employed

1.3.2.1 INCEPTION REPORT PREPARATION

This Inception Report (IR) is the first deliverable in terms of the contractual arrangement between the Client (Project Management Unit in the Ministry of Agriculture, and the Consultant).

In that regard, this Inception Report outlined:

- a. the methodology and modalities for carrying out the assignment including undertaking initial consultations with the client,
- b. work plan,
- c. organization,
- d. schedules and logical framework for executing the assignment among others.

It also indicated the tentative schedule of planned activities, the milestones of the study, and the assignation of roles and responsibilities. It is therefore important for the client to review it carefully and provide feedback so as to complete the assignment within the desired timeframe. Once the IR was approved by the Client, it served as the working guide on agreed road map for the actual execution of the assignment.

1.3.2.2 REVIEW OF DOCUMENTATION

The Consultant has embarked on the review of available secondary literature relevant to the project to get background information on the project so far, the following documents have been accessed and their review is underway amongst others:

- a. Draft ToRs for a Consultancy for preparation of ESMF for the WAATP;
- b. Liberia: Agriculture Commercialization & Agribusiness Development Sector-Scan Draft Report, WBG (February, 2017);
- c. Environmental & Social Management Framework (ESMF) for Liberia Land Administration Project (LLAP), June 2017 under Liberia Land Authority;
- d. Draft WAATP Project Concept Note (PCN) of January, 2017;
- e. Liberia Environmental Policy Requirements and Environmental Protection Agency Act;

- f. EPA EIA Regulations and Procedures; and
- g. The World Bank Operational Safeguards Policies were reviewed to understand those that will be triggered by the project and their requirements incorporated into the ESMF.

1.3.2.3 FIELD BASELINE DATA COLLECTION VISITS

The Consultant undertook field visits to some rice growing farmers, poultry farms, cassava and oil palm areas to assess on ground issues relating environmental and social context of the project. Crop areas, communities and some of the existing agro-processing facilities will be visited to gauge their capacity in terms of effective solid waste management amongst others will be central in the discussions. Photographs for scenes of relevance to the study will be documented as part of the ESMF.

2 PROJECT ACTIVITIES, GENERIC IMPACTS AND MITIGATION MEASURES

2.1 PROJECT COMPONENTS LIKELY TO TRIGGER ENVIRONMENTAL AND SOCIAL SAFEGUARDS

The project components that are preliminarily screened and expected to trigger safeguards concerns include:

2.1.1 COMPONENT 1- STRENGTHENING THE NEW MODEL FOR INNOVATION DEVELOPMENT

This component will support the following interventions in CARI:

- a. Refurbishment of CARI Administrative building;
- b. Construction of livestock research laboratory;
- c. Construction and refurbishment of biotechnology laboratory;
- d. Rehabilitation of piggery and poultry units;
- e. Upgrading and construction of a power distribution line within the Institute;
- f. Upgrading and construction of water distribution system;
- g. Upgrading and construction of ICT system
- h. Rehabilitation of 10 staff houses. However, 2 roofs of existing staff buildings are roofed with asbestos sheets which calls for special handling as summarized in Annex 2 and Figure 18 in this ESMF.
- i. Rehabilitation of 2 irrigation systems for continuous lowland rice cultivation

2.2 WAATP PROJECT POSITIVE IMPACTS

A summary of positive impacts of WAATP can be summarized as follows:

- a. To say the least, community enthusiasm on the project is very high and they see it as answer to their farming challenges since they are increasingly getting caught up in glaring weather variability, increasing human labour shortage as energetic youth are increasingly shunning farming and moving to urban centres, increasing crop failure and daunting challenges of pests (especially the Grass Cutter Rat which is destroying cassava and rice fields) and diseases. Farming communities view WAATP as a remedy to address their challenges through its activities;
- b. The planned WAATP support towards physical infrastructure rehabilitation, re-modelling and equipping of CARI to enable it assume and discharge and deliver agricultural research services in its mandate areas of research i.e. crop research, livestock, natural resources management, value addition, and post-harvest research, bio-technology and mechanization and irrigation will provide much needed input and support to sustainable agricultural production in the country;
- c. The plans to improve water and power supply in CARI will improve the Institutions functionality for enhanced delivery of mandated research outputs. It will improve work environment and productivity at work and most important, provide conducive environment for scientists to be attracted to stay and work in the institute, this is virtually non-existent “CARI is currently functionally dead” reported one scientist who preferred anonymity during the interview;
- d. Horticultural interventions will improve supply of fresh and leafy vegetables which will have a double pronged advantage in terms of incomes to mainly women and youth but also improve nutrition at household with sources of vitamins;
- e. Revitalization of CARI will have a knock-on effect in the economic development of its host area in terms of urbanization and general growth in and around to meet needs of a cross-section of scientists who will be working in the Institute amongst others;
- f. Without necessarily focusing on CARI *per se*, where infrastructure works under the WAATP are to be implemented, there will likely be employment opportunities created for the locals which translates to

economic empowerment at household levels and improvement in livelihoods though it will on short-terms basis;

- g. Investments to support mechanization especially on irrigation will enhance both water availability and efficiency usage in farming making farmers to be able to have more crop seasons in a year thereby guaranteeing household food security and income which translates to better livelihoods and poverty reduction in the communities. Irrigation aspects will not involve construction of dams but focus on water holding ponds (Figure 1) and use of basic irrigation equipment to avail water to the fields.



Figure 1 Typical water holding ponds for both fish and irrigation purposes in Bong



Figure 2 Foot pump irrigation unit which will be similarly fabricated in CARI under the project²

- h. WAATP investments towards decentralizing improvement of planting material for cassava to be implemented by Faith Based Organizations (FBOs) will ensure the communities and farmers have access to better quality planting materials which assures production and productivity translating to food security and incomes at household levels;
- i. WAATP plans to scale up adoption of innovations and improved technologies focusing on youth in the rural areas especially those with evident great interest in the agricultural or rural development to interest and enhance their skills in agricultural production and in value addition will be a welcome gesture to address unemployment of youth in the country which according to Constance Teage³, it has increased to 4% in 2016 from 3.90% in 2015. One the challenges the youth front for shunning agriculture is its continued reliance on rudimentary hand-hoe based technology. However, under WAATP, it is proposed that, innovative technologies be put in place to attract youth to invest their interest and resources in the sector.

² USAID 2015: Food and Enterprise Development (FED) Program for Liberia. Fiscal Year 2015 Annual Workplan

³ *Unemployment rate in Liberia increased to 4% in 2016 from 3.90% in 2015 (Liberia Youth Unemployment Published in The Bush Chicken Article of 10th February, 2015).*



Figure 3 Mechanical Cassava Weeder Developed by IITA⁴

Scaling up the use of ICT and innovations in agricultural outreach, such as E-extension, E-vouchers, electronic technology markets, regional geo-spatial monitoring of technology adoption, innovative rural finance tools will ensure timely and responsive delivery of extension information to farmers giving timely interventions to challenges in agriculture;

- j. Furthermore, the project has plans to create enabling policy environment to accelerate agricultural transformation, connect production to markets and strengthen regional integration institutions. This is to be achieved through removal of barriers to cross-border trade in technologies and inputs, identifying products for which regional demand is growing, and strengthening the institutions at the regional level to provide backstopping for the reform process. These are all to be realized through strategic and deliberate re-orientation of policies, markets and institutional strengthening geared towards revitalization of agriculture;
- k. Provision of grants to the best skilled research teams will bring about development and adaptation of technologies for priority research areas with a focus on addressing constraints along the targeted value chains, hence, facilitating better earnings from the commodities with attendant impacts on reduction at households;
- l. The proposals to upgrade the national seed systems and regional seed markets will ensure farmers have reliable planting materials which ensures better production with a multiplier effect. In addition, scaling up of soil fertility management including soil mapping, soil testing, and fertilizer blending will guide in the agro-input agenda in the agricultural production in the farmers will have knowledge about soil environment and its potential which accordingly will support decision making and investment planning in given areas;

⁴ Wasiu Ayowale 2018: Baseline information on the cassava value chain in Liberia by the International Institute of Tropical Agriculture (IITA) in collaboration with the Smallholder Agricultural Productivity Enhancement and Commercialization (SAPEC) Project

- m. Investments in livestock technology adaptation and dissemination especially with a focus on guinea fowl and chicken producers and determination of approaches to enhance their enterprises is a step in the right direction since those animal products are sources of income and livelihoods at household levels as well as food security;
- n. The project will assess climate change vulnerability on rice and cassava production systems in WAATP Counties and develop an action plan for Climate Smart Agriculture (CSA) especially for rice and cassava which will give farmers adaptation skills to cope with climate changes in the production of these important food items;
- o. Forming partnerships and alliances that are capable of connecting farmers with markets so as to enable farmers to understand market needs and produce for the market; and
- p. The project will support the construction of satellite storage facilities to feed into the warehouse receipt system which is envisaged to address lack of post-harvest and storage equipment as well as in-appropriate marketing systems making agricultural smallholder producers vulnerable to middlemen especially during bumper harvests periods.

2.3 PROJECT ENVIRONMENTAL AND SOCIAL RISKS AND PROPOSED MITIGATIONS

Negative from the project will largely be based on rehabilitation and refurbishment works on the infrastructures at CARI and participating agencies and will largely arise from laboratories and can be summarized as follows:

2.3.1 ENVIRONMENTAL AND SOCIAL RISKS OF REHABILITATION OF LABORATORIES AND WORKSHOPS

2.3.1.1 MANAGEMENT OF ASBESTOS ROOFS ON STAFF HOUSES

It is observed that, two of the staff houses in CARI have asbestos roofs a hazardous material (Figure 8). This ESMF under Annex 2 and Figure 19 are to guide in the safe removal, handling and disposal of asbestos materials in keeping with World Bank Group EHS Guidelines (<https://www.ifc.org/wps/.../2%2BOccupational%2BHealth%2Band%2BSafety.pdf?>) as well as WHO Guidelines on handling of asbestos.



Figure 4 Part of staff house with asbestos roof sheet to be rehabilitated

2.3.1.2 RISKS OF PUBLIC INTRUSION TO THE SITES

There are risks of the public and unauthorized persons to enter the sites works where rehabilitation is being undertaken can have its own impacts on the progress and execution of works as well as theft of construction materials. This is to be checked through securing the site and posting signs that keep off the public from accessing the sites.

2.3.1.3 IMPROPER CONSTRUCTION WASTE MANAGEMENT

Solid waste will be generated at the site during site preparation and rehabilitation phases. The waste may consist of timber or metal cuttings, excavated materials, paper/cement bags, empty paint and solvent containers, broken glass among others. Construction waste will be managed through proper site clearance and restoration.

2.3.1.4 MANAGEMENT OF OBSOLETE LABORATORY AND WORKSHOP EQUIPMENT

Rehabilitation of the laboratories and workshops at CARI will generate some obsolete equipment upon acquisition of state-of-art technologies. The disposal of such obsolete equipment can be an environmental hazard. Some of such equipment if it is usable, will be availed to small research entities some can be disposed in accordance with Amended and Restated Public Procurement and Concessions Act, 2005.

2.3.1.5 GENERATION OF NOISE

Noise will be one of the most undesirable consequences of the rehabilitation phase. Considerable levels of noise and vibrations will mainly result from use of equipment during breakages for modification of spaces inside the facilities. Though the level of discomfort caused by noise is likely to be subjective, the most commonly reported impacts of noise levels will be interference in oral communication in the vicinity of the institute.

2.3.1.6 TRAFFIC AND ASSOCIATED IMPACTS

Traffic impacts will relate to transportation of construction materials to the site and ferrying out of construction wastes. These will likely generate dust emissions will likely have impact on the work environment in the laboratory and workshop areas. The contractors will screen off the worksites inside the facilities and on the access routes to the institutes, the drivers have to observe speed limits.

2.3.1.7 OCCUPATIONAL HEALTH SAFETY (OHS) RISKS FOR THE PROJECT WORKERS

Construction activities have potential to pose occupational risks such as fatal falls if workers do not use safety latches when working at heights. Working with high voltage and hot works (welding) pose a risk of electrocution. In addition, falling debris could injure workers if personal protective equipment (PPE) are not provided or properly used. In all, the workers will be provided with PPEs, work areas be clear of obstacles and proper lighting of the rehabilitation sites.



Figure 5 Illustration of PPEs for welders and warning safety signs on site⁵

2.3.2 OTHER ENVIRONMENTAL AND SOCIAL RISKS DURING REHABILITATION OF LABORATORIES INFRASTRUCTURES

These will include:

1. **HIV/AIDS concerns:** Implementation of works will likely attract labourers to the project areas which can trigger HIV/AIDS concerns and it is proposed that, the project will work with nearby HIV/AIDS service providers to provide counselling and supply of condoms to the workers at agreed terms with the project contractors;
2. **Generation an accumulation of construction waste:** Demolition works will likely generate construction-based wastes and some of the re-usable and re-cyclable materials can be redeemed and used for construction to ensure environmental sustainability;
3. **Borrow pits creation:** A majority of construction materials for use in the rehabilitation works will be sourced locally from traders i.e. bricks/blocks, fill-materials and stones will be from existing suppliers as such, no need for restoration of extraction sites by the project. The County Environment Officers will monitor to see that such areas are restored by those who are engaged in extraction of such materials;
4. **Disposal of excess construction waste:** Excess construction waste material which will not be re-usable will be disposed into areas and in a manner acceptable to Country Environment Officers in respective areas, EPA and the PCU;
5. **Vegetation loss:** The contractor will bring to the site all equipment necessary for carrying out the works and ensure proper safeguards to prevent excess and un-wanted loss of vegetation and soil erosion. In addition, the pathways/access routes have to be managed in accordance with sound environmental practices and such sites will be fully restored to the satisfaction of County Environment Officers (CEOs), EPA and PCU;
6. **Interruption of utility service lines:** Measures be taken to minimize any potential damage to utility public infrastructures on sites where such works are to be undertaken i.e. electricity, water supply, drainage and

⁵ Source: Draft ESMF for East and Central Africa Agricultural Transportation Project, ECAAT March, 2018-Uganda

sewer lines should be mapped out and excavations managed well on such sections to avoid risks of cutting and breaking those lines;

7. **Non-payment of workers:** Payment of salaries and wages is sometimes of concern on sites and it is proposed that, workers be issued with contracts before commencement of work; and
8. **Issues of child labour:** There should be no engagement of children below 18 years on the sites supported by the project. Any contractor with such practice will have his/her contract terminated as such a practice compromises and contradicts both the ILO Employment Convention as well as the Liberian Education and children Act;
9. **Management of obsolete equipment:** In CARI there are obsolete farm mechanization equipment in terms of tractors and tractors parts, field operations equipment plus a lot more which will be exposed once rehabilitation works get underway (Figure 10). Management of such equipment can be an environmental and is proposed that, CARI engages Procurement Agency in Liberia to dispose such items in line with Assets Disposal Act provisions.



Figure 6 A cross-section of obsolete farm machinery in CARI

10. **Adoption of ICT related impacts:** Specifically, under the sub-component which addresses development of demand-driven and market-based mass adoption of technologies and innovations will likely bring about activities focusing on scaling up the use of ICT and associated innovations which can lead to potential generation hazardous e-waste. E-waste and associated accessories will be dropped in designated waste bin and to be collected by the suppliers and such an arrangement should be part of contract agreement between suppliers and consumers of such products and services;
11. **Concerns over handling of agro-pesticides:** Scaling up of soil fertility management including soil mapping, soil testing, and fertilizer blending will call for application of agro-pesticides hence need for PPMP in the project safeguards agenda which is a stand-alone document in this project.

2.3.3 ENVIRONMENTAL AND SOCIAL RISKS DURING LABORATORIES AND WORKSHOPS OPERATIONS

Once rehabilitated and operational, the following negative impacts are anticipated:

- a. **Waste to be disposed by a contracted waste handler:** The laboratories are to have separate bins for separate waste and should be disposed by a contracted service provider in accordance with a given type of waste at hand.

- b. **Incineration:** All other laboratory waste that are deemed unsuitable to be put in the normal waste bins in the laboratories, will be placed in a special waste-bin supplied in each of the laboratories and such items include: broken laboratory glassware, sharp objects of metal or glass, dirty sample tubes or other items lightly contaminated with chemicals and such will all be incinerated. WAATP needs to support construct an incinerator for CARI as part of the support;
- c. **Misuse and inability to operate installed equipment:** There can be risks of laboratory staff abusing the equipment and reagents which has come with economic implications on the costs of operations. This is already addressed through having in place, Standard Operational Procedures for any investigations, training and re-training and ensuring staff operate under hierarchy of supervision and accountability;
- D. **Risks of fires:** Risks of fires in laboratories can be occasioned through spillages, irresponsible storage, handling and application of inflammable reagents, irresponsibly carrying around naked flames, smoking cigarettes and faulty electricity connections. There should be fully functional fire extinguishers; laboratory staff be trained on their operations alongside rescue drills;
- E. **Management of reagents spills:** laboratories to adopt strategies for managing reagents spills as part of their Standard Operating Procedures (SOPs). When a spill occurs, the area is cleared of any users, and the spill cleaned up immediately. Waste from spill clean-up is then disposed of appropriately depending on the kind of chemical. After floor spill has been thoroughly cleaned up appropriately, the area is mopped dry to minimize the risk of slipping and falling;
- f. **General procedure for disposal of expired reagents:** CARI should put in place, a standard protocol in place for the management and disposal of expired and obsolete reagents and should be applicable to all laboratories and screen house operations:
 - i. Routinely checking and prepare list of materials which have are near expiry;
 - ii. A chemical Disposal Form should be filled with all key information which could include: name of the chemical(s), date at which the chemical is to expire and information be filled on a label and attached to the chemical intended for disposal;
 - iii. Such chemicals/reagents are placed in designated rooms i.e. rooms designated for waste storage, with the label facing outwards and clearly visible;
 - iv. Laboratory Manager(s) will be informed of such chemicals intended for disposal;
 - v. The Laboratory Manager then informs the contracted licensed waste disposal agent who arranges for safe transportation and disposal of such wastes within a month of notifying him/her of such development.

2.3.4 APPLICATION AND DISPOSAL OF PESTICIDES

The envisaged agricultural transformation agenda under WAATP will inevitably involve application of agro-chemicals in light of growing pest and disease resistance. However, discussions with the National Agro Inputs Dealers Association of Liberia (NAIDAL) pointed out an array of risks on aspects of transportation, sale, storage, application and disposal of agro-chemicals in the country. To address such concerns, WAATP has prepared a stand-alone Pest and Pesticides Management Plan-PPMP.

2.3.5 IMPACTS OF POULTRY AND PIGGERY BASED ENTERPRISES

2.3.5.1 IMPACTS RELATING TO ODORS

Poultry and piggery facilities are a source of odor and attract flies, rodents and other pests that create local nuisances and carry disease. Odor emissions, caused by a large number of contributing compounds including ammonia (NH₃), volatile organic compounds (VOCs), and hydrogen sulphide (H₂S), from poultry farms can affect the life of people living in the vicinity as such, poultry enterprises ought to observe strict hygienic conditions.

2.3.5.2 RISKS OF VECTORS NUISANCE

Flies are additional concern for residents living near poultry and piggery facilities. There are reports that, residences in close proximity to poultry and piggery facilities equally suffer health impacts arising from nuisance by flies and mosquitoes emanating from such enterprises because dampness due to poor handling of water and poor drainage. Flies nuisance is mainly enhanced by the poor handling and management of animal-feeds. This is to be addressed through observation of good hygiene in such enterprises supported by active extension arm.

2.3.5.3 ENVIRONMENTAL AND SOCIAL RISKS ASSOCIATED WITH POULTRY AND PIGGERY FARMS

The most significant environmental issue relating to poultry and piggery farms result from slaughterhouse operations and discharge of wastewater into the environment. Like many other food-processing activities, the necessity for hygiene and quality control in meat processing results in high water usage and consequently high levels of wastewater generation, having high biochemical and chemical oxygen demand (BOD and COD) due to the presence of organic materials such as blood, fat, flesh, and excreta which in turn may lead to reduced levels of activity or even death of aquatic life. Waste from poultry and piggery farms need to be properly monitored and managed.

2.3.5.4 RISKS IN THE MANAGEMENT OF DISEASED AND DEAD ANIMAL CARCASSES

The operations of the poultry and piggery farms can have challenges of sick, diseased or dead pigs and poultry. To avoid spread of disease and loss of poultry and pigs which can spread to the neighbouring areas, it is suggested that:

- a. Sick/diseased and should be quickly isolated from the rest of the stock into well-constructed isolation areas in the farm where such animals can continue receiving treatment away from the rest of the animals;
- b. Dead animals should be subjected post-mortem examination to ascertain cause of death before their disposal;
- c. Dead animals should be buried and such sites properly back-filled to reduce dogs and scavengers exhuming such carcasses and releasing disease germs to the air; and
- d. All workers in the farms to have changing rooms where they thoroughly clean up before and after work to avoid carrying disease agent to animals and, to the communities.

2.3.5.5 ENVIRONMENTAL AND SOCIAL RISKS ASSOCIATED WITH AGRO-PROCESSING AND VALUE ADDITION INVESTMENTS

2.3.5.5.1 GENERATION OF CROP-BASED WASTES

This intervention will generate a range of waste including husks from rice and cassava peelings which if not well managed will turn to be a public health risks to the communities. In most rice hullers in rural areas of Liberia there are huge heaps of rice husks which farmers try to dispose through burning which adds to carbon emissions generation. Traditionally, rice husk (or hull), which is the outermost layer of the paddy grain that is separated from the rice during milling, is wasted in Africa. Stockpiles of rice husk are either dumped near the mills, where they rot, producing methane (a potent GHG) or burnt in the fields, polluting the atmosphere.

During meetings with CHAP in outskirts of Monrovia, it was reported that, farmers are increasingly realizing the value of rice husk and turning it into various products i.e. building material, fertilizer or fuel (*Esther S. Tuowal, Jeremiah P. Smith, Harris M. J and Blamo Chae pers. comm. March 2018*). Loose rice husk can be burned in a stove but can cause a lot of smoke however, Africa Rice Center (AfricaRice) and its partners are developing a manual multi-piston briquette machine to compress rice husk to make briquettes, which burn efficiently in any well-ventilated stove and can be used for cooking by rural households, who cannot afford or do not have access to gas.

The use of briquettes is a more economical, healthy and environmental-friendly way to provide renewable green energy, as it reduces the need to cut down trees to make firewood which is systematically and steadily degrading forest cover in Liberia. Producing energy from rice husk for domestic use, agricultural operations and industrial processes offers a great opportunity to deliver benefits to resource-poor farmers and processors. The rice husk briquetting could therefore generate employment in rural areas, particularly for women and youth, protect the environment, and reduce poverty and improve the quality of life for the rural poor.



Figure 7 Cassava peeling session in Lofa areas



Figure 8 Picture of briquets in CHAP offices in Monrovia

2.3.5.5.2 RISKS OF FOOD INSECURITY AT HOUSEHOLD LEVELS

Industrialization and commercialization of the commodity crops will have economic benefits at household and national levels and no doubt, increase income at household levels. However, this must be balanced in such a way that, households don't focus on industrial market at expense of household food security.

2.3.5.5.3 PREPARATION OF ENVIRONMENTAL ASSESSMENTS-EAS

Once industrial ventures are started, the operations of such facilities will generate a host of environmental and social impacts which can compromise the investment objectives. It is recommended that; the developers of such ventures conduct appropriate and independent Environmental Assessments in relation to the products being developed i.e. nature of enterprises and their operations and such Assessments will be subjected EPA Approval procedures. under Standard Operational Procedures for such industries.

2.3.5.6 ENVIRONMENTAL AND SOCIAL RISKS OF POWER BACK UP INVESTMENTS

These will take forms of back-up generators and solar installations and some of the anticipated negative impacts will include:

2.3.5.6.1 INVESTMENTS IN STANDBY POWER GENERATORS AND THE IMPACTS

2.3.5.6.1.1 AIR QUALITY IMPACTS

The Proposed Action construction would temporarily impact air quality in the immediate area of the installation site by increasing vehicular and machinery emissions. These increased emissions would be short-term in nature. Emissions from operation of the generator set would be minimal and temporary due to the limited use of the generators. Air emissions would be limited to periodic generator start-up to ensure generators are functioning properly, and any emissions would short-term in nature.

2.3.5.6.1.2 NOISE IMPACTS

Operations of the standby generators will likely be of concern in relation to its operations. It is proposed that, CARI and PCU procure standby generators manufactured in the state of art technologies in terms of minimal noise generation and vibrations. Construction noise would be short-term and limited to normal construction hours.

2.3.5.6.1.3 HAZARDOUS MATERIALS AND WASTE

If the intervention is standby generators, it is likely that, servicing the generators will likely generate hazardous wastes such as oil filters, used oils and obsolete batteries amongst others (Figure 13). It is proposed that, the entities will retain the services of a service provider who will be responsible for maintenance and servicing of generators as such, take up disposal of wastes that will likely be generated.



Figure 9 Spillage effect inside a standby power generator being operated in the PMU, MoA

3 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

This section reviews the national policies, regulations, procedures and legal provisions relating to the environment and social issues in development interventions. The reviews have been made against the World Bank safeguards policies' requirements as well as Liberian applicable laws/policies as summarized below:

3.1 LIBERIA ENVIRONMENTAL POLICY REQUIREMENTS

3.1.1 NATIONAL ENVIRONMENT POLICY OF LIBERIA (2002)

The policy goal is to ensure long-term economic prosperity of Liberia through sustainable social and economic development, which enhances environmental quality and resource productivity on a long-term basis that meets the requirements of the present generation without endangering the potential of future generations to meet their own needs.

3.1.2 LAND ADMINISTRATION POLICY, 2015

The Land Administration policy presents a framework for land administration in Liberia. It focuses on the main features of good land administration and those pertaining to the identification, ownership, use, and valuation of land, including information on all lands, as well as the identification of land and the determination of rights to the land, recording of those rights, valuation of land and the management of government and public land, coordination of land use planning, the establishment of the institutional framework at central and local government levels to carry out this mandate.

3.1.3 LAND RIGHTS POLICY (2013)

The Policy provides the Land Commission's policy recommendations for land rights in Liberia, centered on four basic types of rights:

- a. Public Lands – lands designated for future use; managed in the public interest; and which is not Government Land, owned by a community and used or managed in accordance with customary practices and norms, or owned as Private Land;
- b. Government Lands: land owned by the Government and used for the buildings, projects, or activities of the Government;
- c. Customary Lands: land owned by a community and used or managed in accordance with customary practices and norms, and may include, but is not limited to: wetlands, communal forestlands, and fallow lands. Customary Land rights, including the rights of ownership, use or management, are equally protected as Private Land rights, whether or not the community has self-identified, established a legal entity, or been issued a deed; and
- d. Private Lands: land owned by an individual or private entity, in which management and use decisions are based solely on formal law (i.e. statutes, regulations, executive orders, and court decisions), where the owner enjoys the full bundle of land rights, which include, but are not limited to, the right to: exclude all others, use and possession, own natural resources on the land (e.g. forest), and to transfer all or some of the rights through sale, lease, concession, gift, donation, will, or any other lawful means.

3.1.4 THE NATIONAL RICE DEVELOPMENT STRATEGY OF LIBERIA (REPUBLIC OF LIBERIA 2012A)

Aims to improve food security and achieve self-sufficiency through the doubling domestic rice production by 2018. Rice is a staple cereal crop in Liberia with great social and political significance. Demand far exceeds local production, however, which requires high imports and affects the country's trade balance and foreign exchange.

3.1.5 NATIONAL ENVIRONMENTAL AND OCCUPATIONAL HEALTH POLICY, 2010

In relation to the WAATP, the main objectives of the National Environmental and Occupational Health Policy is to assess the working conditions in major work places, establish data base, plan and implement workers' wellness programs, for the purpose of protecting and promoting health in the workplace for all workers in Liberia, to provide guidelines and standards for the effective implementation and rendering of occupational health services.

3.2 LIBERIAN LEGAL FRAMEWORK

3.2.1 THE CURRENT CONSTITUTION OF LIBERIA 1986

Came into force in 1986, and results in a system of government heavily modeled on the federal government of the United States. The Constitution is largely silent on the issue of natural resources and sustainable development. However, Article 7 of the Constitution states: "The Republic shall, consistent with the principles of individual freedom and social justice enshrined in this Constitution, manage the national economy and the natural resources of Liberia in such manner as shall ensure the maximum feasible participation of Liberian citizens under conditions of equality as to advance the general welfare of the Liberian people and the economic development of Liberia.

3.2.2 ENVIRONMENTAL PROTECTION AGENCY (EPA) ACT, 2003

The Act creates the Agency as the principal authority in Liberia for the management of the environment and shall co-ordinate, monitor, supervise and consult with relevant stakeholders on all activities in the protection of the environment and sustainable use of natural resources. Part III of the 2003 Law establishes a fairly comprehensive framework for EIA, including procedures and substantive standards for the approval and rejection of projects. It also provides for public participation and procedures for appeals against EPA decisions.

3.2.3 ENVIRONMENTAL PROTECTION AND MANAGEMENT LAW, 2003

The law forms the legal framework for the sustainable development, management and protection of the environment and natural resources by the Environmental Protection Agency in partnership with relevant ministries, autonomous agencies and organizations as well as in a close and responsive relationship with the people of Liberia. It addresses a wide range of environmental issues including environmental impact assessment amongst others in development projects.

3.3 EPA REGULATIONS AND PROCEDURES

The EPA Regulations combine both assessment and environmental management systems. The regulations prohibit commencing an undertaking/activity without prior registration and Environmental Permit (EP). Undertakings are grouped into schedules for ease of screening and registration and for the EP. The schedules include undertakings requiring registration and EP (Schedule 1), EIA mandatory undertakings (Schedule 2), as well as Schedule 5-relevant undertakings.

The Regulations also define the relevant stages and actions, including: registration, screening, Preliminary Environmental Assessment (PEA), Scoping and Terms of Reference (ToR), Environmental Impact Assessment

(EIA), review of EA reports, public notices and hearings, environmental permitting and certification, fees payment, ESMP, suspension/revocation of permit, complaints/appeals etc.

3.4 WORLD BANK SAFEGUARD POLICIES

The Project is rated as a category B type and triggers the policies as summarized below:

Table 1: Summary of WB safeguards policies in relation to the project

Safeguard Policies	Triggered?		Remarks
	Yes	No	
OP 4.01 Environmental Assessment	✓		WAATP will support infrastructure refurbishing and rehabilitation in CARI and participating agencies which will involve construction works hence, triggering this safeguard policy which will necessitate some level of Environmental Assessment which includes preparation of this ESMF. The ESMF will guide screening and any required environmental and social assessment, including development of ESMP, during implementation. The WBG-EHS Guidelines shall also be applied during project implementation to safeguard both the workers and general public.
OP 4.04 Natural Habitats		X	Agricultural activities in the project will not be undertaken in natural habitats hence, this policy is not triggered.
OP 4.09 Pest Management	✓		Agricultural transformation will be aiming at improved production and productivity as such, usage of agro-pesticides is envisaged which will trigger this safeguards policy and has necessitated preparation of a PPMP alongside this ESMF.
OP 4.10 Indigenous People		X	No records of Indigenous groups will be impacted by the projects as such this policy is not triggered.
OP 4.11 Physical Cultural Resources		X	This safeguard is not likely to be triggered because the project will not be undertaken in areas designated and physical cultural sites.
OP 4.12 Involuntary Resettlement	✓		The project will not undertake any activities that will displace people. Farmers who will be involved in the project will have interventions on their lands hence, minimal uptake of peoples' lands is envisaged. While these interventions are yet to be identified, a separate Resettlement Policy Framework is being prepared as part of the project environmental and social safeguards preparation process.
OP 7.50 Projects on international waters		X	This policy is not likely to be triggered because the project activities are not likely to use shared/transboundary or international waters.
OP 4.36 Forests		X	OP 4.36 does not apply to this project. This Policy is triggered when "whenever any Bank-financed investment project (i) has the potential to have impacts on the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests; or (ii) aims to bring about changes in the management, protection or utilization of natural forests or plantations." Interventions under this project will not seek to do any of the above-mentioned activities.
OP 4.37 Safety of Dams		X	The project has aspects addressing irrigation BUT the focus is fabrication of basic irrigation equipment for small-scale/handheld irrigation not elaborate dams etc. This policy is not triggered therefore.

3.5 INSTITUTIONAL FRAMEWORK

3.5.1 MINISTRY OF AGRICULTURE-MOA

The Ministry also implements agricultural programs, protects farming interests, encourages investment in the agricultural sector, and monitors overall activities including the movement of agricultural commodities into and out of the country. The Ministry also regulates the harvesting of botanical species by herbalists and other farmers as a part of shifting cultivation practices. The MOA includes four departments: Administration; Planning and Development; Technical Services; and, Research and Extension. The Quarantine Service within the Technical Service department is charged with oversight, is weak of invasive species.

3.5.2 ENVIRONMENTAL PROTECTION AGENCY-EPA

In support of the establishment of the EPA, the EPA Act (GoL, 2003a) also established County and District Level environmental committees, responsible for the local delivery of national environmental policy and priorities. In a move towards a more bottom up approach, a key function of the committees is to articulate local level environmental issues to the EPA who in turn are charged with formulating and passing on a relevant response for local level implementation.

In addition, under Section 20 and 21 of the EPA Act (GoL, 2003a), the EPA is mandated to appoint environmental inspectors within districts to monitor the implementation of environmental standards as established under the EPML (GoL, 2003b). The power of these inspectors is wide ranging and includes the provision to close “any manufacturing plant, establishment or other activity which pollutes or is likely to pollute the environment, contrary to the provisions of the Act” (GoL, 2003a).

3.5.3 TRADITIONAL MANAGEMENT PRACTICES

Local level resource management is implemented through traditional systems and practices. At the lowest level of local administration, power and decision-making is in the hands of traditional tribal authorities. The highest rank is that of Paramount Chief who is responsible for the actions of a number of Clan Chiefs. The Paramount Chief is elected by the chiefs and elders but serves at the discretion of the President, who may veto the election.

The Council of Elders (elderly, respected community members) must be consulted on important matters. The Paramount Chief has responsibility for enforcement of tribal customs, aspects of law and order, collection of taxes by lower rank chiefs, and promotion of agriculture, industries, trade and welfare. It is difficult to judge the power of the chiefs, who remain strongly influenced by the secret societies (*Poro/Sande*) in relation to observance of tribal customs. Chiefs are not government employees but retain a portion of taxes for their services and for local projects. Traditionally, their power is largely determined by their control (not ownership) of land. The interactions between the State and its institutions with the traditional tribal institutions and practices are regulated by the Hinterland Laws 1949.

3.5.4 CENTRAL AGRICULTURAL RESEARCH INSTITUTE (CARI)

CARI is an agricultural research facility that is slowly recovering from the civil conflict. CARI was amongst the GOL institutions hardest hit by the protracted civil conflict, because it served as the base for three successive warring factions, then was home to over 10,000 displaced persons for five years, and finally became an UNMIL sector base. Current emphases include rice, cassava, and yam improvement; maize, fruits and vegetable screening and evaluation; animal husbandry; and, aquaculture.

3.5.5 NGOS

Action for Greater Harvest (AGRHA) and Community of Hope Agriculture Project (CHAP) whose missions is to ***“Ensure Sustainable Food Security for Rural Liberian Households”*** will be well placed to implement some components of WAATP in rural areas. This is because their vision and mission is all geared to ensuring Liberians in rural Liberia households create sustainable food security for themselves.

3.5.6 WORLD BANK

In past years, the World Bank has supported aa couple of projects in the agricultural sector namely; West Africa Agricultural Productivity Project (WAAPP) and the Smallholder Tree Crop Revitalization Support Project (STCRSP) from 2013-2016. Under WAATP the Bank which finances the project will have a central support supervisory in its compliance with safeguards and related undertaking in line with financing agreement.

4.1 PHYSICAL ENVIRONMENT

4.1.1 COUNTRY PROFILE

The Republic of Liberia is located at latitudes 4°21' N and 8°33' N of the equator and longitudes 11°28'W and 7°32'W. Liberia covers 111,369km², and is located entirely within the humid Upper Guinean Forest Ecosystem in West Africa on the Atlantic Coast. The area of Liberia's Exclusive Economic Zone (EEZ) is 229,700 km², extending 370.4 km (200 nautical mi) seaward from shore.

4.1.1.1 ADMINISTRATIVE AND POLITICAL JURISDICTIONS

Liberia is divided into a hierarchical arrangement of political jurisdictions consisting of 15 counties (each with a designated county seat), 136 districts arrayed within counties, and numerous clans arrayed within districts (Figure 2). Individual counties comprise from 4-18 districts and varying numbers of clans. The six largest counties (>7,770 km²) are: Nimba County--11,551 km²; Lofa County-- 9,982 km²; Gbarpolu County--9,953 km²; Sinoe County-- 9,764 km²; Bong County--8,754.0 km²; and Grand Bassa County--7,813.7 km². Other counties range in area from 1,880 km² (Montserrado County) to 5,663 km² (Rivercess County).



Figure 10 Map of Liberia showing counties and administrative set up

4.1.2 PHYSIOGRAPHY

Four physiographic regions, corresponding largely to increasing elevation, are apparent in Liberia, and roughly parallel to the coast (Figure 3; Gatter 1988):

- Coastal Plains:** lying at sea level to about 30m in elevation (average elevation about 15m above m.s.l.) varies from 16-40 km in width. The Coastal Plain coast is about 560 km long and consist of a nearly unbroken sand strip, salt and freshwater lagoons, and a few promontories.
- Rolling Hills:** The belt of Rolling Hills, lying at about 200-330 m elevation (average about 92 m), is parallel to the Coastal Plain and has numerous hills, valleys, and waterways. Rivers flow rapidly in this region over bedrock bottoms and have numerous rapids within their channels.
- Mountain Ranges and Plateaus:** These lie behind the belt of Rolling Hills; nearly half of the interior of Liberia lies between 200-330 m in elevation in this region. Major mountain ranges, consisting of long ridges aligned along a southwest-northeast axis, are the Mano River Mountain, Gibi Range, and Putu Range, whose summits reach 700m. Summits in the Bong range reach 500 m in elevation.
- Northern Highlands:** Two disjunct areas form the Northern Highlands: the Wologizi Range north-eastern Lofa County, which is variously reported as reaching 1335-1380 m in elevation at Mt. Wutivi, the highest point in Liberia (UNDP 2006). The other highland area is the Nimba Mountain range, in north-eastern Nimba County, which reportedly reaches maximum heights of 1,305 or 1,385 m on the Liberian side of the border the range is shared by Côte d'Ivoire, Guinea, and Liberia.

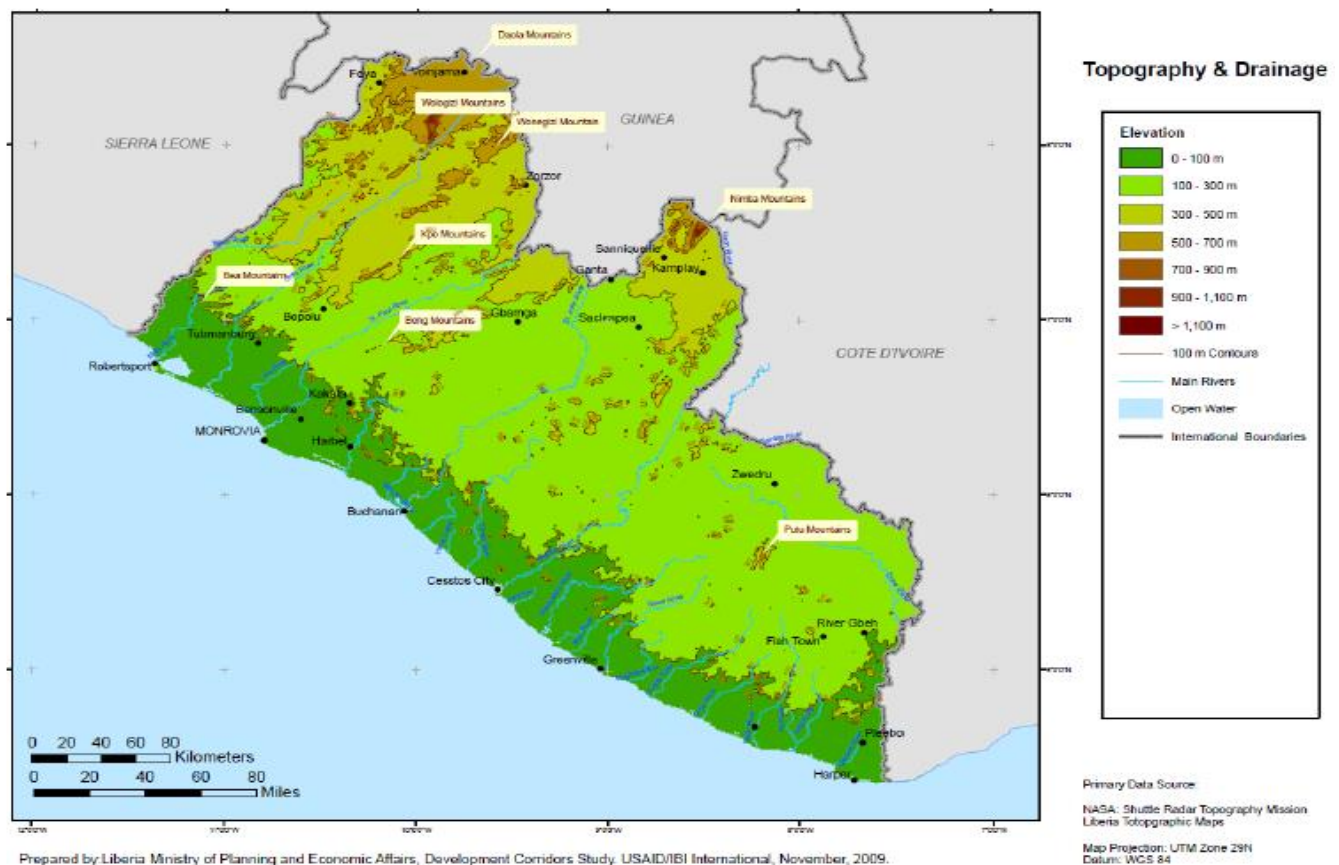


Figure 11 Topographic and Drainage map of Liberia

4.1.3 SOILS

Large areas of Liberia (75%) are Ferralsols that are highly weathered soils with low fertility and low capacity to retain nutrients (low cation exchange capacity). They are suitable for surface farming techniques and provide valuable materials for road construction. They are well-drained with good physical structure; their deep rooting depth makes up for their relatively low water-holding capacity. Acrisols are less weathered than Ferralsols but still low in mineral nutrient reserves. The presence of a subsurface layer of clay accumulation may impede internal drainage and makes them more susceptible to erosion. About 4% of Liberia is covered by Gleysols (Histosols) that are typical of swamps and areas in the floors of valleys waterlogged during the rainy season. These soils have high humus content and suitable for cultivation of swamp rice, with proper water management.

4.1.4 CLIMATE

Liberia's climate consists of two separate climate regimes: the equatorial climate regime restricted to the southernmost part of Liberia, where rainfall occurs throughout the year, and the tropical regime dominated by the interaction of the Inter-tropical convergence zone (ITCZ) and the West African Monsoon. Because of Liberia's coastal location, the southwesterly flow of the monsoon prevails most of the year, maintaining a thin layer of moist marine air near the surface, although the Harmattan Wind typically intrudes for brief periods during the winter in coastal areas. This interaction of the ITCZ with the monsoon flow produces the summer wet season-winter dry season characteristic of a tropical climate (Figure4).

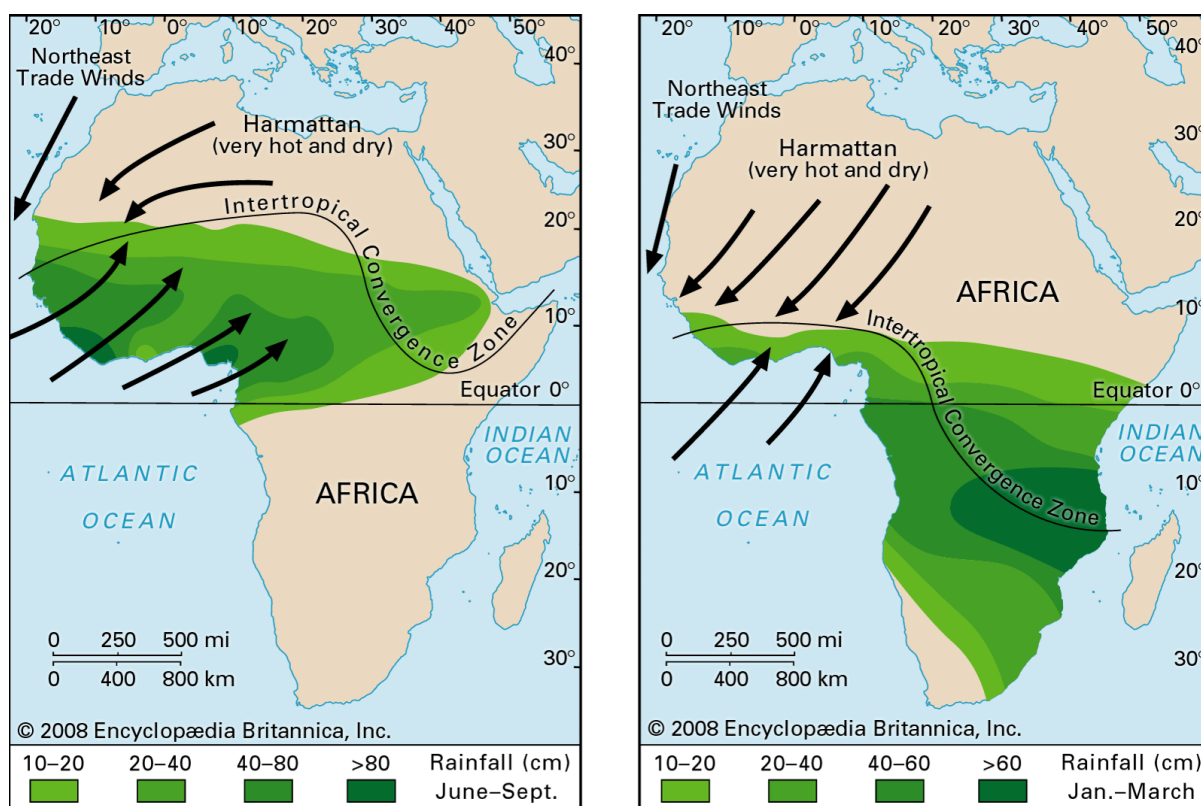


Figure 12 West African monsoon (Encyclopedia Britannica Online Accessed 19 April 2011⁶)

⁶ ESMF for Smallholder Tree Crops Project MoA, 2011

The tropical climate of Liberia is hot and humid throughout the year, with little variation in temperature (mean daytime temperatures: 27⁰-32⁰C; mean nighttime temperatures: 21⁰-24⁰C). There are two distinct seasons in Liberia, dry (November-May) and wet (May-October). Annual rainfall amounts are 4000-5000 mm along the coastal belt, declining to 1300 mm at the forest-savanna boundary in the north. The seasonal variation in rainfall has a critical influence on the vegetation. Liberia exhibits a fairly high average relative humidity throughout most of the year ranging from above 80% along the coastal belt with lower humidity in the interior portion of the country. During the Harmattan season (December-March), the dust-laden winds blown in from the Sahara can reduce the relative humidity to 50% or lower.

4.1.5 LAND COVER AND VEGETATION

Liberia is situated within the Upper Guinean Forest that extends from Guinea at the northwestern extreme to the eastern limit in Cameroon. The Upper Guinean Forest is fragmented and Liberia is estimated to account for more than half of West Africa 's remaining Upper Guinean tropical forest (Figure 4). The climax vegetation over most of Liberia is forest, which covers about 4.39 million hectares or 45 percent of Liberia's land area. The most recent forest classification (2006) included 2.42 million hectares of closed dense forest, 1.02 million hectares of open dense forest and 0.95 million hectares of agriculture/degraded forest.

4.2 SOCIO-ECONOMIC ENVIRONMENT

4.2.1 POPULATION

In 2016, the total population of Liberia was estimated at approximately 4.4 million inhabitants with a density of 36 individuals/km² which represented 65% increase since 1984. Liberia's population growth rate in 2008 was estimated to be 5.3% and is expected to decline to 2.1% by 2025. Net migration is positive as a result of immigration from surrounding countries that have also experienced political unrest. An estimated 58% of the population of Liberia lives along the coast (EPA 2007).

4.2.1.1 POPULATION DENSITY

According to USAID 2013⁷, the highest concentration of population occurs in and around coastally located Monrovia, the capital and largest city in the country, including Montserrado and nearby counties. Montserrado County has 595 individuals/km², and nearby Margibi County has 78 individuals/ km², Bomi County, 44 individuals/ km², Bong County, 38 individuals/ km², and Grand Bassa County, 28 individuals/ km², which includes the seaport Buchanan. Other counties with moderate to high relative densities include Maryland County (59 individuals/km²) which includes the coastal city of Harper in the extreme southeast, bordering Côte d'Ivoire; north central Nimba County (40 individuals/km²), bordering Guinea and Côte d'Ivoire; Lofa County (72 individuals/km²) in the west, bordering Sierra Leone; and Grand Cape Mount County (27 individuals/km²) in the northwest, which includes the coastal city of Robertsport and borders Sierra Leone and Guinea. The remaining 6 counties have densities ≤15 individuals/km².

4.2.2 HUMAN INDICATORS

By any measure, Liberia is one of the poorest and least developed countries in the world, and among sub-Saharan African countries. Liberia's 2013 Human Development Index score places it 174th out of 186 countries. According to GoL figures, nearly 64% of Liberians, or 2.5 million people, live below the poverty line, and 48% live in extreme poverty.

⁷ USAID 2014: *Liberia Climate Change Assessment Report*

4.2.2.1 FOOD SECURITY STATUS

The 2013 Liberia Comprehensive Food Security and Nutrition Survey estimates that more than one in three Liberian households has an “unacceptable” food consumption pattern, i.e. one that cannot sustain an active and healthy life (WFP, 2013). In Liberia most, rural households are food insecure, meaning that they lack access at all times of the year to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Nationally, 80% of the rural population was either moderately vulnerable (41%) or highly vulnerable (40%) to food insecurity (GoL 2007). Different rural livelihood profiles provide differing degrees of food security; the most food insecure groups were those involved in palm oil production and selling followed by hunters and contract laborers.

4.2.2.2 LIFE EXPECTANCY

Other health indicators are also poor: average life expectancy at birth is 61 years (2016⁸) with estimated fertility rate of 4.65 children per woman.; infant mortality is 70 deaths per 1,000 live births (2013); and, maternal mortality rate is 770 deaths per 100,000 live births (2010). HIV prevalence among adults aged 15-49 years is 1.5% (2009). Adult literacy rates average 61% (2010). Poverty and underdevelopment are not the only challenges. Liberia emerged from its protracted civil war as a deeply divided country, its social fabric torn by ethnicity, religion, geography, and history. There are 16 ethnic groups, and Christianity (85%), Islam (12%), and indigenous religions (3%) are practiced.

4.2.2.3 SIZE OF HOUSEHOLD POPULATION

On average, household size is 5.6 persons, with the proportion of female-headed households varying from 5% in Bomi County to 21% in Lofa County, the area most heavily and continually affected by violence during the conflict (USAID, 2014). The effects of the conflict are evident as well in the spatial distribution of disabled people as a percentage of the population.

4.2.3 AGRICULTURE

Rural Liberians depend upon two main crops, rice and cassava. Protein comes primarily from bushmeat and fish. Various regional projections suggest that rice will be negatively impacted by higher temperatures, even if precipitation is adequate. Upland rice, the predominant cropping system, will be impacted by changes in seasonality of precipitation. Cassava, on the other hand, is adapted to high temperatures, drought and erratic rainfall. Current plant breeding programs aim to address the direct impacts of climate change on crop growth and the indirect effects of increased incidences of pests and diseases. Getting improved varieties to farmers will require improved extension delivery systems and available financing. Effects of climate change on agricultural production are the most likely in the interior counties of Bong, Lofa, and to a lesser extent Nimba. These were the primary agricultural areas before the conflict; these areas are the most likely to experience higher temperature maxima and altered rainfall patterns under the projected future climate.

⁸ UNDP: Human Development Report 2016. Human Development for Everyone. Briefing note for countries on the 2016

5 STAKEHOLDER CONSULTATIONS

Stakeholder consultations were undertaken during the preparation of this ESMF as follows:

5.1 MEETING WITH THE CLIENT

The Consultant interacted with the Project Management at the Project Management Unit (PCU) to discuss details of the project and to gain insight into the stakeholders and contact persons to be met during field studies. It also provided an opportunity for the consultant to request for a list of documentation for the assignment. Other issues focused on stakeholders to be contacted, plan for the consultations and scheduling of meetings, logistics modalities and emphasis on timelines and need to keep safeguards documents within the framework of project preparation milestones by the Bank

5.2 MEETINGS WITH THE ENVIRONMENT PROTECTION AGENCY-EPA

Through the PCU, the Consultant placed meetings with the management of EPA on matters relating to the WAATP project safeguards preparation process, approval procedures and key issues to be taken care in the project. The Meeting with the EPA Manager for Compliance and Enforcement echoed the challenges of on-ground inspection and monitoring of projects which the Agency does through its County Environmental Inspectors though this framework has challenges in terms of facilitation and ensuring retention of staff in the field. Aspects of agro-chemicals importation and regulation are still a challenge in agricultural sector because of fragmented management of the process.

5.3 MEETING WITH WORLD BANK SAFEGUARDS UNIT

During the study, the Consultant met World Bank Senior Social Safeguards as well and issues of on-ground implementation and reporting on compliance were central based on current challenges on projects funded by the Bank in other sectors including agriculture. In all, under WAATP, it is strongly recommended that, the PCU should have two staff i.e. Environmental and Social Management Specialists who will play an inter-phase role between the Project, Bank and EPA on matters of on-ground reporting on project compliance. Details of this process will be worked between the PCU and the Bank in consultations with the EPA especially as relates to recruitment.

5.4 MEETINGS WITH RESEARCH SCIENTISTS

Field visits will be made to the Central Agricultural Research Institute (CARI) which is mandated to conduct research in 7 thematic areas viz; livestock, crop, natural resources, value addition and post-harvest, agricultural mechanization and irrigation. Discussions were held with the Director General (DG) and his staff on thematic issues relating to anticipated WAATP support to the Institutions and implications therein from environmental and social safeguards perspective. A synopsis of envisaged infrastructure-based interventions was discussed and shared which informed the ESMF on anticipated environmental and social safeguards issues likely to be triggered by the project as summarized herein under section 1.2.2. Other issues were the management of hazardous materials i.e. asbestos roof sheets which are to be managed as in Annex 2 herein.

5.5 MEETINGS WITH FARMER GROUPS

The Consultant inter-phased with Farmers Groups (Figure 1 and Annex) especially those growing rice and cassava to establish a couple aspects relating to their operations growing cassava and rice with a focus on; the challenges they encounter in growing the crops, aspects of crop pests and diseases and how they control such pests in their crops, issues of agro-pesticides with respect to access, transportation, storage, application and management of obsolete pesticides; post-harvest challenges; power supply; availability, affordability and

impacts of value addition investments; and issues of equipment and land clearance and equipment requirements.



Figure 13 Meeting with communities in Lofa to discuss WAATP issues

5.6 MEETINGS WITH THE PRIVATE SECTOR PLAYERS AND NGOS

The Consultant held meetings with private sector players especially National Agro-Dealers Association of Liberia (NADAIL) focusing on the management and application of agro-pesticides, pesticides abuse and health risks. Meeting was also Community of Hope Agriculture Project (CHAP) to discuss aspects of community engagement in rice production and specifically, Climate Smart Agriculture (CSA) with the communities in view of erratic rains for the crop.

5.7 SOME OF THE KEY STAKEHOLDER CONCERNS FROM THE CONSULTATION MEETINGS.

Some of the key stakeholder comments on the project arising from the discussions are summarized as follows:

1. EPA is concerned about reporting general over-sight on agricultural projects due to shortage of man-power in some counties which makes it hard for the Agency to get on-ground status of project implementation. The suggestion to have safeguards staff at the PCU for WAATP and STAR-P is welcomed by the Agency and willing to be part of recruitment process to give technical feel to such a process (i.e. formulation of ToRs, short-listing and interview process once invited);
2. Investing in standby diesel power generation as option for CARI needs to be planned taking into having in place, need to have generators manufactured using state-of-art technologies which ensure minimal emissions, low noise levels and their housings should be constructed as per specifications for such equipment. However, in view of high operational and maintenance costs alongside associated environmental challenges in terms of spillages and management and disposal of used accessories, the project could explore investing in clean energy systems especially solar installations as opposed to thermal generators both at the PCU and CARI;

3. There are growing problems of climate variability which is affecting crop production and household food security, agencies like CHAP are taking up to assist farmers with CSA adoption and would be glad if WAATP and STAR-P programs could support their concepts especially with rice farmers;
4. There are also growing problems of pests getting resistant to pesticides and sometimes, the pesticides are increasingly unable to fight pests due to adulteration, poor storage and lack/failure to give correct use/dosage information and a host of other limitations. NADAIL is proposing educating agro-dealers, support programs of educating farmers on;
5. NADAIL is doing a good job to organize and empower agro-dealers and also raise awareness on the part of farmers on risks of improper handling and application of pesticides despite their popular usage. However, they have a host of limitations in terms of capacity to effectively reach out to all the corners of Liberia, there is issue of room or office space for training of agro-dealers leave alone information management. These need support for timely and effective discharge of information to the farmers;
6. Issues of climate change are affecting water availability both for farming and livestock keeping. A project like this needs to come up with some interventions to ensure sustainable water supply for the rice farmers and its efficient usage which implies, mechanization and irrigation sub-component needs to be answer to the community needs and hence, be designed taking into account, production needs at grassroot levels;
7. The problem of pests and diseases is key especially the grass cutter rat recognized by the farmers as a serious menace to cassava and rice;
8. Most of PCU agricultural activities have lots of implications on the environment on a number of fronts namely; post-harvest issues, irrigation, mechanization, crop protection, livestock and agri-business amongst others. It is also evident that, for now most financing partners are keen on safeguards issues in the projects and the need for timely production of safeguards documents. In view of these, stakeholders feel that, the agency needs to institutionalize its environmental and cross-cutting issues, for management on sustainable basis. A deliberate Environmental and Social Management Unit should be set up and staffed with at least two specialists namely; Environmental Management and Social Development Specialists whose roles should be to institutionalize cross-cutting themes into the Unit and majorly, play an interphase role between the Unit, MoA, Bank and EPA in terms of environmental reporting and monitoring;
9. Waste from rice is a problem to dispose and at Africa Rice, the waste is being used to make briquettes a form of fuelwood. This should be popularized in all rice growing areas for environmental sustainability in the sector; and
10. Piggery and poultry provide integrated ventures to address crop wastes management especially cassava and rice respectively and farmers need support for supply of fast and disease resistant breeds of the two animals. Previous efforts have seen farmers lose thousands of birds and pigs with no help in terms of treatment.

5.7.1 GRIEVANCE REDRESS MECHANISM

The Grievance Redress Mechanism (GRM) will provide a way to provide an effective avenue for expressing concerns and achieving remedies for communities. The goal is to promote a mutually constructive relationship and enhance the achievement of project development objectives. The GRM is to ensure that complaints are directed and expeditiously addressed by the relevant agencies which is to enhance responsiveness and accountability. While a project-specific feedback and complaints mechanism is set up, the WAATP will incorporate the existing grievance mechanism that uses the chieftom-based approach in areas of the project.

5.7.1.1 TYPICAL GRIEVANCES UNDER WAATP

Likely common grievances in WAATP implementation areas will include:

- a. Abuse or improper use of pesticides;
- b. Crop destruction by neighbors' livestock;
- c. Non-payment of work done;
- d. Access routes through a neighbour garden
- e. Non-payments of infrastructure construction materials;
- f. Employment opportunities offered by the projects activities; and
- g. Encroachment on neighbors' lands

At project level, each Implementing Partner is expected as an operational institution to have in place, its mechanisms of handling feedback and complaints which the WAATP project will essentially build on. Such a mechanism will be checked to ascertain its effectiveness, accessible and transparent procedures to receive and resolve complaints and where need be and for purposes of delivering this project, it shall then be reviewed and modified accordingly.

Feedback/ complaints shall be encouraged among all workers and community members throughout the project and resolved without undue delay. This will also be closely monitored and reported. It is important that, concerns are raised on project level before they are brought to the PCU level.

5.7.1.2 PRINCIPLE OF GOOD GRM

The grievance mechanism should follow the following principles:

- a. it should be scaled to address the risks and impacts on affected communities,
- b. be culturally appropriate,
- c. be clear and accessible for any individual or group at no cost (vulnerable groups), and
- d. be transparent and including regular reporting, and preventive of retribution and to not impede access to other remedies.

Furthermore, the grievance mechanism should be designed to provide access to specific target groups, e.g. girls and women who, might be subject to sexual harassment during construction, would need avenues to submit grievances that protect their privacy. In the complaint resolution, the Implementing partners should use existing complaint and resolution mechanisms, including informing the PCU about serious concerns/complaints and involve them in the resolution, if appropriate. All grievances should be logged in a complaint register to assess whether the grievance is closed or whether further action is needed.

5.7.1.3 STEPS OF GRIEVANCE REDRESS

A verbal or a written complaint from aggrieved person will be received by the Project Manager or a person assigned in the project as the Grievance Officer (GO) and recorded in a grievance log (electronically if possible).

Grievances can be lodged at any time, either directly to the Contractor, Sub-county/District Office or via the grievance committee member.

The process for lodging a complaint is outlined below:

- g. The GO will receive a complaint from the complainant.
- h. The GO will ask the claimant questions in their local language write the answers in English and enter them in English onto the Grievance Form.
- i. A representative of the community shall witness translation of the grievance into English.
- j. The GO reads the complaint in English and translates it into the complainant's local language on the Grievance Form.
- k. The local leader and the complainant both sign the Grievance Form after they both confirm the accuracy of the grievance.
- l. The GO lodges the complaint in the Grievance Log.

5.7.2 GRM MECHANISM UNDER WAATP

Local grievance redress committees (LGRC) will be initiated at the village level to record grievances and also help in mediation. This committee will comprise the area local chief or a trusted village elder, a religious representative, and specific vulnerable group representatives of relevance to the village i.e. women and the disabled. Disputes will be resolved at the village level as far as possible. The GRC at the district and county levels will be resolved under a County/District GRM constituted by the Project. At the County Level, the Grievance Redress Committee will be established to deal with any grievances unsettled at the village level. More serious grievances must immediately be referred to the police. It is important to note that, not all conflicts and grievances in the project are to be concluded under WAATP GRM. More serious cases that involve assault, gender-based violence, rape and "serious" theft will not be resolved under this framework but are instead referred to the police for appropriate prosecution process.

6 PROCEDURES FOR ENVIRONMENTAL SCREENING AND ASSESSMENT

6.1 ENVIRONMENTAL SCREENING UNDER OP 4.01 ENVIRONMENTAL ASSESSMENT

6.1.1 PROJECTS CATEGORIZATION

Sub projects will be screened in order to develop appropriate required safeguards instruments in line with both WB policies and National EIA requirements. Accordingly, taking into account, the level of anticipated activities during project implementation, location of the project sites which will not be in ecologically sensitive habitats, localized and minimal resettlements, not having any impacts on areas of physical cultural importance and generally their impacts being localized and of short-term nature all imply that, this project is been categorized as Category B type.

On the other-hand, those projects with large scale adverse negative impacts are placed as category A type which is not applicable in WAATP.

6.2 INTRODUCTION AND APPLICATION OF THE ESMF

It is noted that, WAATP proposes a number of interventions to support its implementation and while many of the interventions will take the form of formalized projects (rehabilitation of CARI infrastructures), some will not have such a formal project structure. For example, there could be meetings convened to develop regulations or regulations necessary for WAATP and agricultural improvement. In such cases, the ESMF should still be considered, since policies and legislation can require mainstreaming environmental dimensions into them under the EPML. Despite these, in the present circumstances, this ESMF presents the environmental and social assessment process taking into account, project perspective as summarized below.

Other than details and specifics of WAATP in terms of the nature and locations of the projects that will be financed under the World bank have not yet been fully defined, and so cannot be evaluated in terms of their environmental and social performance. Therefore, under such circumstances, it is crucial to have a process in place so the WAATP implementing agencies can identify, evaluate, and manage any environmental and social performance risks that may arise once details of the projects are established. This process also ensures the project complies with the relevant environmental and social performance while safeguarding requirement of the Liberian EPA and WB.

This section of the ESMF sets out the process to identify, assess, and manage the environmental and social impacts once a project's details are more fully defined. The ESMF ensures that the mitigation measures required to address environmental and social impacts for specific WAATP investments, are incorporated in the assessment of the project and its management processes. This process ensures that both WB and Liberian procedures, with respect to environmental and social safeguarding, are addressed in an integrated fashion.

The process description includes the World Bank Environmental Assessment process and the Liberian ESIA requirements, as set out in Section 3.0, and the procedures that must be followed in the event World Bank financed project triggers safeguard policies (e.g. should the project involve involuntary resettlement, pesticide use, or chance finds of cultural significance). General clauses that can be included in Contractor's Agreements to ensure compliance with these procedures are also provided.

Once the project and its locations have been identified, the PCU should use this section of the ESMF as a guide to progress through the various stages of implementation.

6.3 STEPS FOR IDENTIFYING, ASSESSING, AND MANAGING ENVIRONMENTAL AND SOCIAL IMPACTS

6.3.1 GUIDING CONSIDERATION ON ENVIRONMENTAL AND SOCIAL SCREENING

Environmental screening is guided by a couple of considerations such as:

What is the Level of Significance of the Potential Social and Environmental Risks?

Type and location: Is the Project in a high-risk sector or does it include high-risk components? Is it located in sensitive areas (e.g. in densely populated areas, near critical habitat, indigenous territories, protected areas, etc.)

- Magnitude or intensity:** could an impact result in destruction or serious impairment of a social or environmental feature or system, or deterioration of the economic, social or cultural well-being of a large number of people?
- Manageability:** will relatively uncomplicated, accepted measures suffice to avoid or mitigate the potential impacts, or is detailed study required to understand if the impacts can be managed and which management measures are needed?
- Duration:** will the adverse impacts be short-term (e.g. exist only during construction), medium term (e.g. five years) or long-term?
- Reversibility:** is an impact reversible or irreversible?
- Community Involvement:** Absence of community involvement is an inherent risk for the success and sustainability of any project. Have project-affected communities been consulted in project planning and design? Will they have a substantive role to play in the Project going forward?

Through the screening process, projects are rated both on likely impact and probability on a scale of 1 (low) to 5 (high) for each identified risk (Table 2).

Table 1: Rating the 'Probability' of a Risk⁹

Score	Rating	Social and environmental impacts
5	Critical	Significant adverse impacts on human populations and/or environment. Adverse impacts high in magnitude and/or spatial extent (e.g. large geographic area, large number of people, transboundary impacts, cumulative impacts) and duration (e.g. long-term, permanent and/or irreversible); areas impacted include areas of high value and sensitivity (e.g. valuable ecosystems, critical habitats); adverse impacts to rights, lands, resources and territories of indigenous peoples; involve significant displacement or resettlement; generates significant quantities of greenhouse gas emissions; impacts may give rise to significant social conflict
4	Severe	Adverse impacts on people and/or environment of medium to large magnitude, spatial extent and duration more limited than critical (e.g. predictable, mostly temporary, reversible). The potential risk impacts of projects that may affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples are to be considered at a minimum potentially severe.
3	Moderate	Impacts of low magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures
2	Minor	Very limited impacts in terms of magnitude (e.g. small affected area, very low number of people affected) and duration (short), may be easily avoided, managed, mitigated
1	Negligible	Negligible or no adverse impacts on communities, individuals, and/or environment

⁹ UNDP Social and Environmental Screening Procedure March, 2016.

6.3.2 ENVIRONMENTAL AND SOCIAL SCREENING STEPS

These steps are discussed in detail in the subsections below.

6.3.2.1 STEP 1: ENVIRONMENTAL SCREENING

A screening of each proposed intervention or project should be undertaken. The PCU with assistance from the EPA will:

- a. Classify the intervention in accordance with OP4. 01 into one of three categories A, B, or C depending on type, location, and scale of the interventions, and the nature and extent of its potential environment impacts.;
- b. Ensure compliance with the national EIA screening process with both the EPA and World Bank safeguards processes;
- c. Determine and formally agree with the EPA on the level of assessment required (e.g Project Brief or ESMP, full scale ESIA will be required) or whether a FONSI can be granted.

To facilitate this process, the PiU will develop a standard screening checklist form that incorporates:

- a. The Liberian national EIA Screening Form;
- b. Criteria that reflects the WB, including whether the site and proposed intervention presents risks to natural habitats, water quality and water resource availability and use, natural hazards, cultural property, involuntary resettlement, and pesticide use;
- c. Process for checking whether the mitigation measures identified through the WAATP ESMF process apply; and
- d. Identification of stakeholders, including groups that may be affected by the project (to be appended to the checklist).

Information to complete the checklist may require field visits and key informant interviews. Following this screening, the PCU through its Environmental and Social Management Specialists who are to have oversight on WAATP operations will prepare and submit a Notice of Intent and Project Brief consistent with requirement set out in the EPML to the EPA. In certain instances, and subject to EPA confirmation, completion of an EPA screening form may replace the Project Brief. If so, the screening form must be prepared by an EPA registered evaluator. Annex 3 provides a proposed template, along with other monitoring report templates.

6.3.2.2 STEP 2: ENVIRONMENTAL AND SOCIAL ASSESSMENT STUDIES

If the screening process identifies the project as both Category A (under WB requirements) and one that requires an ESIA under Liberian law, a harmonized EIA approach will be undertaken. This harmonized approach addresses WB safeguards that may be triggered and Liberian EIA requirements in a single process that is documented in one report. This harmonized EIA should be relatively straightforward, as the criteria that determine the three risk categories adopted by the WB and EPA (under the EPML) are similar.

As such, Category A projects under the WB criteria generally meet the same criteria that would require a full ESIA under the EPML; Category B projects generally meet the same criteria that would require an ER; and Category C projects generally meet the criteria for a FONSI. However, this may not always be the case: in some instances, the processes required and criteria applied may vary. For example, the requirement to consider natural habitats within WB OP4.01 is not reflected in Liberian legislation, and the requirement to

implement management plans for projects in receipt of a FONSI is not reflected in requirement for Category C projects. In such cases, the ESIA safeguard process should adopt the higher of the two standards.

Step 2A: As per the process outlined above, the PCU (safeguards specialists) should prepare the ToRs for the ESIA or any level of required Environmental Assessment study/deliverables that may be required (e.g., preparation of a RAP, a Pesticide Management Plan, etc.). Recruitment or engagement of such service providers should follow EPA procedures for selecting consultants for Environmental Assessments and the selected consultant must be a registered environmental evaluator. The ToRs should include issues identified in the screening exercise including any requirement specified by the EPA as a result for that process.

The development of comprehensive ToRs is a key step in safeguard process, which will define the tasks required to undertake the ESIA and define the scope of outputs required (see sample in Annex 6).

Step Bb: As part of the EA/EIA process, the necessary safeguard documents will be produced in which case: An ESMP, a set of contract/partnering/financing agreement clauses, and a summary of public consultation carried out for Category A/ESIA interventions;

- a. Simplified ESMP outlining measures identified during the EA study for Category;
- b. A RAP for interventions that may result in involuntary resettlement or displacement (explained in more detail in the Project's Resettlement Process Framework below); and
- c. An Integrated Pest and Pesticides Management Plan (PPMP) for interventions that include agricultural activity where pesticide use is anticipated. Guidance on preparation of an Integrated Pest Management Plan in the PPMP prepared for this Project as a stand-alone deliverable.

The ESMP should comply with requirements specified in OP4.01 and identify:

- a. Potential E&S impacts related to siting, construction, and operation of the intervention;
- b. Mitigation and monitoring measures to address potential impacts;
- c. Responsibilities for monitoring ESMP requirements;
- d. Training and capacity-building requirements for project officers and communities;
- e. Estimated budget for mitigation monitoring and training; and
- f. Measures to ingrate the ESMP into the intervention's overall planning design budget and implementation.

The Developer (MoA/PCU) should submit copies of the ESIA or as appropriate to the EPA.

6.3.2.3 STEP 3: APPROVAL

In compliance with WB guidelines and Liberian EIA requirements, the applicable documents (ESIA, ESMP, and/or RAP) must be made available for public review before a project can be approved. Public review must be at a place accessible to local people (e.g. at county/district council office, EPA offices) and in a form, manner, and language they can be easily understood.

For those developments that require mandatory ESIA's under the Liberian legislation, the EPA will review and when satisfied with it, they provide environmental permit. On the other hand, WB reviews and provides clearance to safeguards instruments (ESIA, ESMP, RPF, RAP, etc) once they conform to the requirements. As emphasized in the WB's guidelines, a subproject of a project (WAATP) should not be approved and funded until such reports are received, approved, and disclosed.

6.3.2.4 STEP 4: MONITORING

Before projects are finalized and signed off, review of contracts/partnering or financing agreements should be undertaken by the PCU to verify that measures identified in the ESMP, ESMF are included in the clauses for successful contractors or other partners that will be implementing WAATP sub-project activities. Therefore, during the project implementation phase, project management should undertake monitoring in accordance with the management measures as set out in the ESMPs and ESMF or other safeguards documents prepared under the WAATP. Results of the monitoring should be regularly included in regular reports to the financing agency (World Bank). It is important that, the PCU ensures that such reports are received in a timely manner so that any potential non-compliance with the standards is rapidly identified and rectified, and that data and indicators required for program monitoring are generated. Annex 3 provides templates for such monitoring reports.

6.4 ESMF IMPLEMENTATION FRAMEWORK

The Project will build on the successful institutional arrangements mechanisms of WAAPP. It will be coordinated: (i) at the national levels by existing national Coordinating units (PCU), which successfully coordinated the implementation of WAAPP; and (ii) at the regional level by CORAF based on a well-defined mandate agreed by the Regional Steering Committee (RSC) under the Annual Work Plan and Budget (AWP&B). This component aims to ensure that the project is efficiently managed and performance and impact are carefully tracked. The component would also support annual foresight conferences to monitor trends in the sector and emerging needs, training of national counterparts to contribute to the analytical work, regular monitoring by the Agricultural Science and Technology Indicators group (ASTI) of CGIAR and national counterparts of expenditure on R&D, measurement of productivity, monitoring of jobs created and project management, and impact analysis.

CORAF will be strengthened by establishing a small regional coordination unit with key staff. The staffing of CORAF and each PCU will include a social safeguard/gender specialist, an environmental safeguard/climate change specialist, a private sector specialist, a communication specialist, an M&E officer, the fiduciary staff (Procurement and Financial Management), the Project coordinator and at least one technical expert.

The role of EPA, one of the key institutional mandates of EPA include among others ensuring the observance of proper safeguards in the planning and execution of all development projects including those already in existence that have or are likely to have significant impact on the environment. The role of EPA in WAATP will be to review and approve environmental impact assessments and Project Briefs as well as monitoring records submitted in accordance with the Environment Act and the respective regulations. **AfricRice** is to contribute to poverty alleviation and food security in Africa, through research, development and partnership activities aimed at increasing the productivity and profitability of the rice sector in ways that ensure the sustainability of the farming environment. IN WAATP, this entity will be pivotal in thematic research agenda on aspects of rice.

6.4.1 MONITORING AND EVALUATION

The objective of this sub-component is to facilitate project implementation, management, and evaluation in each participating country. Each participating country will put in place an implementation mechanism best suited to its needs and specific context. Overall, this mechanism will include a National Steering Committee (NSC), a Project Coordination Unit (PIU), and a Technical Advisory Committee (TAC) with clear roles and responsibilities for each to be finalized during project pre-appraisal.

The key functions of the PCU include: coordination of project activities across all implementers, development and implementation of a robust Monitoring and Evaluation (M&E) and geographic information system (GIS) to monitor project performance; and fiduciary support financial management, procurement, and safeguards. The M&E arrangements will include Annual Research and Development workshops both at the national and regional levels to share outcomes and lessons learned. Each PIU will be properly staffed with managerial, fiduciary and safeguards staff as well as technical specialists on key aspects of the project—including agricultural research and development, agricultural marketing and trade.

6.4.2 CAPACITY BUILDING FOR ESMF IMPLEMENTATION

In order to ensure successful delivery of the project, including the mitigation and improvement measures, it will be necessary for the PIU amongst others, to strengthen both its own capacity to guide the environmental and social safeguards processes, that of its participating agencies and the beneficiary communities to sustainably achieve the project objectives. Involvement of the stakeholders at key stages in the development and operation will be a key factor in avoiding risks of non-compliance which could jeopardize the project development objective in the long run. Therefore, the PIU will appoint two specialists viz; an Environmental and Social Development Specialists who will be responsible for steering and playing oversight role regarding compliance of the project with both GoL environmental requirements as well as those of World Bank.

These appointees would be the point of contact for all issues related to environmental and social impact management of project initiatives and activities. One of the two Specialists would be designated as an Environmental Manager and is to responsible for official liaison with the EPA and participating line agencies and the Bank. Similarly, an Environmental Officer in the target counties will be responsible for day to day issues arising from project implementation. Where there is no County Environment Officer, it is suggested that, the County or District Agricultural Officers be designated to oversee environmental and social safeguards in the project. Collectively these officials will be the project's Environmental and Social Management Team (ESMT) coordinated in the PIU.

Each member of the project management team will be responsible guiding conformity with applicable laws and regulations, and for conducting their work responsibilities in accordance with permit requirements and the ESMP. The environmental management controls that should be used at each of the project development locations to assist in meeting the overall environmental management objectives for the project should include, but not be limited to:

- a. Environmental Awareness Training: Awareness and sensitization need to be conducted for project management staff to give hints on key safeguards aspects such as environmental screening, formulation of ESMP, environmental monitoring and compliance reporting;
- b. Awareness on the project social mainstreaming: these should address awareness and sensitization covering HIV/AIDS and gender mainstreaming, mainstreaming occupational health and safety and issues of child labour in the project works, workers' rights and privileges in line with the national labour requirements, issues;
- c. Sensitization on the preparation and implementation a stakeholder engagement plan, inform all communities affected by the project on its implementation schedule, available job opportunities, information on project need to access local construction materials in the communities;
- d. Sensitization on identification and assessment of environmental and social risks in the project including those related to gender, climate change and vulnerability; and

- e. Environmental compliance inspections: involvement and role and how to involve project safeguards monitoring and reporting.

It is important that the ESMT meet regularly and as frequently as necessary to coordinate prompt reaction to arising issues, evaluate data from the monitoring program and assure efficient implementation of the ESMP. A representative of the EPA should be invited to attend these meetings as well as representatives of other supporting agencies when appropriate (e.g. when specific expertise is required).

6.4.2.1 CAPACITY BUILDING IN CARI

Once CARI is re-vitalized, the Institute will pick up several development assistances whose financiers will insist on environmental and social safeguards mainstreaming as such, it is proposed that, as part of its revitalization process and aware of its human resource constraints, the Institute should designate one of its technical staff to play a role of Environmental and Social Safeguards Liaison Officer. The Liaison Officer is to play an interphase role between the Institute, EPA and PCU on matters of environmental compliance in its establishment. Such officer once designated could benefit from short-term specialized trainings on safeguards such as an environmental screening, EIA process, reporting and monitoring amongst others.

6.4.2.2 ENVIRONMENTAL AND SOCIAL SAFEGUARDS UNIT IN THE PCU

In view of increasing environmental and social concerns in development process, the PCU needs to have in-house capacity of at least two specialists i.e. Environmental and Social Management Specialist and a Social Development Specialist. It is evident that, under this arrangement the two Specialists will be responsible for mainstreaming environmental and social issues in all PCU plans and activities. It will also champion environmental awareness and capacity building within the various ranks of WAATP participating agencies while maintaining a liaison role between the PCU, EPA and development partners (World Bank) in the areas of environmental and social safeguards.

6.4.2.3 CAPACITY BUILDING FOR COLLABORATING INSTITUTIONS

It is anticipated that, there will be a range of collaborating institutions under the project will include NGOs and FBOs, the NGOs such as CHAP, and the private sector players (NAIDAL) and participating farmers. Each of these categories will require responsive capacity enhancement on aspects of safeguards issues based largely their levels involvement in WAATP project activities. **Capacity Building:** Will be inform of training on safeguards mainstreaming and reporting.

6.4.2.4 RE-ORGANIZATION SUPPORT TO NAIDAL

Launched in March 2017, ADAL is the umbrella organization of trained and qualified agro-dealers across the country involved in providing agro-inputs and educating farmers on how they can properly use the inputs. Available information and meetings with senior management of NADAIL indicates that, NAIDAL in collaboration with development partners has trained at least 45 agro-inputs dealers through a mobile transaction system that will benefit smallholder farmers in the fifteen counties of Liberia. It was an initiative that was supported by the MoA under the Liberia Agriculture Transformation Agenda (LATA), which seeks to empower local farmers with key inputs such as seeds, fertilizers, and pesticides to increase yields in the various value chains to make the country self-reliant in food production. It is proposed that, NAIDAL could be supported to deliver training on safe handling and trade in agro-chemicals a trade which the local traders are largely not handling safely compared to multi-nationals such as Firestone, Greenfield Liberia, Al-Madina General Supplies, Wenco and Sime-Darby.

6.4.2.5 SUPPORT TOWARDS AGRO-CHEMICALS MANAGEMENT IN EPA

At the moment, there are more issues on agro-chemicals which appear to emanate from the handling, manufacture, transportation, importation, labelling, storage, use and disposal of these inputs. EPA through its Environmental Standards and Research Unit in the Department of Environmental Compliance and Enforcement is maintaining a record of approved agro-inputs though the agency acknowledges limitations in terms of capacity to effectively take charge in the trade in agro-inputs.

6.5 MONITORING, EVALUATION, AND REPORTING

6.5.1 MONITORING

Monitoring is required to ensure that all the required environmental and social mitigation measures, set out in the ESMF for the project are implemented satisfactorily. The objective of monitoring is to ascertain that, the proposed mitigation measures are being implemented and that, there is compliance to the terms and conditions for approval for the project.

The purpose of the environmental and social safeguards monitoring includes:

- a. Ensure that proper appraisals on the effects of sub-projects takes place and that proper measures are put in place to mitigate the effects;
- b. Set out the basis for compliance and enforcement of terms and conditions for approval;
- c. Design compliance strategies;
- d. Assess compliance with and management of the environment and social safeguards; and
- e. Ensure that all stakeholders participate in the sub-project processes

6.5.2 MONITORING INDICATORS

To trace implementation compliance of the project, it is proposed that the following indicators be employed to check levels of project compliance.

These are:

- a. Safe removal and disposal of asbestos roof sheets;
- b. Measures for disposal of construction wastes;
- c. Provision and usage of personal protective equipment by workers;
- d. Restoration and full re-grassing of construction sites;
- e. HIV/AIDS awareness sensitization; and
- f. Payment proof for workers employed in the project.

Monitoring, evaluation and reporting on environmental and social issues will form part of the overall -project implementation processes (Annex 3). It is expected that; the Counties and District Environment Officers will capture and report on environment and social issues on a monthly basis. The monitoring reports will then be compiled and sent to ESMU in PIU for review and who will then prepare a consolidated quarterly monitoring report and share it with the Bank. The ESMU Safeguards Specialists will verify the application of mitigation measures as contained in the field reports submitted to the Unit. The reporting on environmental monitoring will be included in the overall project progress report which will be shared with the World Bank, EPA and line stakeholders as necessary.

6.5.3 REPORTING

Implementing agencies for WAATP project will be required to report on the progress of project implementation in line with financing agreement. It is expected that, such reports should capture the experience with implementation of the ESMF provisions and the reports will amongst others, provide:

- a. an assessment of extent of compliance with ESMF procedures, learn lessons, and improve future ESMF performance;
- b. to assess the occurrence of, and potential for, cumulative impacts due to project-funded and other development activities; and
- c. A record of progress, experiences, challenges encountered, lessons learnt and emerging issues from year-to-year implementation of ESMF that can be used to improve performance.

The reports shall include the following key information:

- a. An introduction, Reporting period and monitoring locations
- b. Scope of works and status of implementation of activity being reported on
- c. ESMF management actions undertaken during the reporting period
- d. Progress to date in implementing the ESMF, including key aspects monitored: such as waste management, health and safety practices, procurement/storage/and use of pesticides including their disposal, dust management, water quality, other environmental incidents and accidents, environmental awareness and training undertaken, etc.
- e. Key recommended follow up issues, actions, time frame and responsibility centre(s).

6.5.4 ESMF BUDGET AND DISCLOSURE

Below are estimates to successfully implement the ESMF for WAATP.

Table 2: Indicative ESMF Budget for WAATP

Nº.	Item/Activity	Cost in USD
01.	Costs of employing two Safeguards Specialists in the PIU for 5 years	336,000
02.	Capacity building for Counties and District Environment inspectors	75,000
03.	Cost of an incinerator at CARI	25,000
04.	Equipping and support operationalize the Safeguards Unit in the PIU (5 years)	125,000
05.	Preparation of EA documents for future sub-projects.	45,000
06.	Mainstreaming HIV/AIDS (5 yrs) ¹⁰ .	50,000
07.	Technical backstopping (Safeguards Consultants to the PIU Unit)	60,000
08.	Safe disposal of asbestos roof sheets	5,000
09.	Environmental Audit of WAATP	55,000
Total Budget Estimate for ESMF Implementation		776,000

6.6 ESMF DISCLOSURE

The disclosure is a requirement from the World Bank safeguard policies as well as from national environmental assessment procedures, and therefore the report will be available to project affected groups, local NGOs, and the public at large. The PCU will make copies of the ESMF available in selected public places as required by law for information and comments as well as in the media. The ESMF will be announced and published on an official Government website. EPA and PCU/MoA will upload the ESMF and other safeguards for WAATP onto its website <https://www.moa.gov.lr/> and invite the public to access and review the documents. The PCU will also provide copies of the ESMF, PPMP, RPF and other safeguards documents in the project to the public in its Secretariat, CORAF and at CARI from where the public can access it for any comments. The ESMF, PPMP& RPF alongside other safeguards documents will be disclosed at the World Bank's website

¹⁰ Proposed a service provider to conduct HIV/AIDS awareness sensitization on work sites and distribution of condoms

and made available to any interested persons for public access and for public information and comments/feedback as will be necessary.

7 REFERENCES

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8.1 ANNEX 1: ENVIRONMENTAL AND SOCIAL SCREENING FORMS FOR PROJECT SUB-COMPONENTS

8.1.1 SCREENING FORMS LABORATORIES REHABILITATION

Please type or print clearly, completing this form in its entirety. You may provide additional information on a separate sheet of paper if necessary. This will guide in the identification and categorization of the project accordingly.

Component under WAATP	Component 1: Strengthening the new model for innovation development in West Africa
Name of Subproject	Subproject 01: Accelerating mass adoption of improved technologies and innovations
Project Development Objective-PDO	The PDO is to accelerate adoption of agricultural improved technologies and innovations by small scale producers and contribute to improve enabling environment for regional market integration in the ECOWAS region and enable the Governments to respond promptly and effectively to eligible emergencies.
Expected Commencement Date	2018
Proposed Main Project Activities	Rehabilitation of the laboratories infrastructures
Location (County, District and village)	Lofa, Grand Gedeh, Nimba, Bong, Bomi, River Gee, Margibi, Cape Mont.
Name of Evaluator	

DESCRIPTION OF PROCESS THAT COULD BE IMPLEMENTED

Briefly describe the type and nature or type of the project at the site.

POTENTIAL ENVIRONMENTAL IMPACTS

Please indicate environmental impacts that may occur as a result of the proposed project.

A. The Biological Environment**The Natural Environment**

Describe the habitats and flora and fauna in the project area and in the entire area expected to be affected by the sub-project (e.g., downstream areas, access roads): ***Under this sub-component, the project works will be undertaken within the existing laboratory premises without impacting on neighboring natural ecosystems (forests, swamps, grasslands).***

Will the project directly or indirectly affect?

Natural forest types? **No**

Swamps? **No**

Wetlands (i.e., lakes, rivers, swamps, seasonally inundated areas)? **No**

Natural critical habitats (parks, protected areas)? **No**

Other habitats of threatened species that require protection under Ugandan laws and/or international agreements? YES _____ NO **X**_____

Are there according to background research/observations any threatened/ endemic species in the project area that could be affected by the project? YES _____NO **X**_____

Will vegetation be cleared? If yes, please state the distance/length of affected area

YES ☒ _____ NO _____

The vegetation clearance will be localized within the surroundings of the laboratories and not substantial (negligible).

Will there be any potential risk of habitat fragmentation due to the clearing activities? YES _____NO **X**_____

Will the project lead to a change in access, leading to an increase in the risk of depleting biodiversity resources? YES _____ NO **X**_____

Provide an additional description for “yes” answers:

Protected Areas

Does the subproject area or do subproject activities?

Occur within or adjacent to any designated protected areas? YES _____ NO **X**_____

Affect any protected area downstream of the project? YES _____ NO **X**_____

Affect any ecological corridors used by migratory or nomadic species located between any protected areas or between important natural habitats (protected or not) (e.g., mammals or birds)? YES _____NO **X**_____.

Provide an additional description for “yes” answers:

Invasive Species

Is the sub-project likely to result in the dispersion of or increase in the population of invasive plants or animals (e.g., along distribution lines)? YES _____ NO: **X**_____

Provide an additional description for a “yes” answer:

B. The Physical Environment

Geology/Soils

Will slope or soil stability be affected by the project? YES _____ NO: **X**_____

Will the subproject cause physical changes in the project area (e.g., changes to the topography)?

YES _____ NO: **X**_____

Will local resources, such as rocks, wood, sand, gravel be used? YES _____ NO: **X**_____

Could the subproject potentially cause an increase in soil salinity in or downstream the project area? YES _____ NO: **X**

Could the soil exposed due to the project potentially lead to an increase in lixiviation of metals, clay sediments, or organic materials? YES _____ NO **X** _____

Landscape / Aesthetics

Is there a possibility that the sub-project will adversely affect the aesthetics of the landscape? YES _____ NO **X** _____

Pollution

Will the sub-project use or store dangerous substances (e.g., large quantities of hydrocarbons)?

YES _____ NO **X** _____

Will the subproject produce harmful substances? YES _____ NO **X** _____

Will the subproject produce solid or liquid wastes? YES **✓** _____ NO **X** _____

Will the subproject cause air pollution? YES _____ NO **X** _____

Will the subproject generate noise? YES **✓** _____ NO _____

Will the subproject generate electromagnetic emissions? YES _____ NO **X** _____

Will the subproject release pollutants into the environment? YES **✓** _____ NO _____

Solid and effluent waste risks will likely arise from the operations of the enterprises and such risks will be minimized through good management operations involving

C. The Social Environment

Land Use, Resettlement, and/or Land Acquisition

Describe existing land uses on and around the sub-project area (e.g., community facilities, agriculture, tourism, private property, or hunting areas):

Largely research work in crop and animal aspects. _____

Are there any land use plans on or near the sub-project location, which will be negatively affected by subproject implementation? YES _____ NO **X** _____

Are there any areas on or near the subproject location, which are densely populated which could be affected by the sub-project? YES _____ NO **X** _____

Are there sensitive land uses near the project area (e.g., hospitals, schools)?

YES _____ NO **X** _____

Will there be a loss of livelihoods among the population? YES _____ NO **X** _____

Will the sub-project affect any resources that local people take from the natural environment?

YES _____ NO **X** _____

Will there be additional demands on local water supplies or other local resources?

YES _____ NO **X** _____

Will the sub-project restrict people's access to land or natural resources?

YES ____ NO X

Will the project require resettlement and/or compensation of any residents, including squatters?

YES ____ NO X

Will the subproject result in construction workers or other people moving into or having access to the area (for a long-time period and in large numbers compared to permanent residents)?

YES ____ NO X

Who is/are the present owner(s)/users of resources/infrastructures the subproject area?

____ *The site is owned by the institute i.e.*
CARI. _____

Loss of Crops, Fruit Trees, and Household Infrastructure

Will the subproject result in the permanent or temporary loss of:

Crops? **No**

Fruit trees / coconut palms? **No**

Household infrastructure? **No**

Any other assets/resources? **No**

Occupational Health and Safety, Health, Welfare, Employment, and Gender

Is the sub-project likely to safeguard worker's health and safety and public safety (e.g., occupational health and safety issues)? YES ____ ✓ ____ NO ____

How will the project minimize risk of HIV/AIDS? ***HIV/AIDS sensitization and awareness campaigns will be conducted. How will the sub-project minimize the risk of accidents? How will accidents be managed, when they do occur? The workers will be provided with PPEs***

Is the project likely to provide local employment opportunities, including employment opportunities for women? YES ____ ✓ ____ NO ____

Provide an additional description for "yes" answers:

The project will provide workers with PPEs while on site and the site will post safety signs within its establishment to guide traffic and safeguards the public from the impacts of works.

Historical, Archaeological, or Cultural Heritage Sites

Based on available sources, consultation with local authorities, local knowledge and/or observations, could the sub-project alter:

Historical heritage site(s) or require excavation near the same? YES ____ ✓ ____ NO ____

Archaeological heritage site(s) or require excavation near the same? YES ____ NO X ____

Cultural heritage site(s) or require excavation near the same? YES ____ NO X ____

Graves, or sacred locations (e.g., fetish trees or stones) or require excavations near the same?

YES _____ NO _____ **X** _____

N.B For all affirmative answers (YES) Provide description, possible alternatives reviewed and/or appropriate mitigating measures. ***The excavations will be for foundations of the rehabilitation sites in the project.***

RECOMMENDATIONS

Environmental category: (tick where applicable)

	Category	Justification
	Does not require further environmental or social studies	No
	Requires a full ESIA to be submitted on date	No
	Requires an ESMP to be submitted on date	No Yes, because of some details to guide on removal and disposal of asbestos which will be removed from some staff houses
	Requires a RAP to be submitted on date	No
	Requires an Indigenous Peoples Plan (IPP)	No
	Requires a Physical Cultural Resources Plan	No

CERTIFICATION

We certify that we have thoroughly examined all the potential adverse effects of this subproject.

Reviewer:

Name:

Signature:

Date:

8.1.2 ENVIRONMENTAL AND SOCIAL SCREENING FORM FOR POULTRY AND PIGGERY ENTERPRISES

Please type or print clearly, completing this form in its entirety. You may provide additional information on a separate sheet of paper if necessary. This will guide in the identification and categorization of the project accordingly.

Component under WAATP	Component 1: Strengthening the new model for innovation development in West Africa.
Name of Subproject	Subproject 01: Accelerating mass adoption of improved technologies and innovations.
Project Development Objective-PDO	The PDO is to accelerate adoption of agricultural improved technologies and innovations by small scale producers and contribute to improve enabling environment for regional market integration in the ECOWAS region and enable the Governments to respond promptly and effectively to eligible emergencies.
Expected Commencement Date	2018
Proposed Main Project Activities	Establishment of piggery and poultry enterprises.
Location (County, District and village)	Lofa, Grand Gedeh, Nimba, Bong, Bomi, River Gee, Margibi, Cape Mont.

BRIEF DESCRIPTION OF THE PROPOSED PROJECT: Promotion of livestock at household levels especially poultry and piggery.

POTENTIAL ENVIRONMENTAL IMPACTS

Please indicate environmental impacts that may occur as a result of the proposed project.

A. The Biological Environment

The Natural Environment

Describe the habitats and flora and fauna in the project area and in the entire area expected to be affected by the sub-project (e.g., downstream areas, access roads): ***Under this sub-component, the poultry and piggery enterprises will be undertaken within the homesteads and in the research institutions as such, negligible impacts on the existing natural environment i.e. no impacts on forests, swamps, grasslands).***

Will the project directly or indirectly affect?

Natural forest types? **No**

Swamps? **No**

Wetlands (i.e., lakes, rivers, swamps, seasonally inundated areas)? **No**

Natural critical habitats (parks, protected areas)? **No**

Other habitats of threatened species that require protection under Ugandan laws and/or international agreements? YES _____ NO: **X**_____

Are there according to background research/observations any threatened/ endemic species in the project area that could be affected by the project? YES _____ NO: **X** _____

Will vegetation be cleared? If yes, please state the distance/length of affected area

YES ☒ _____ NO _____

The clearance will be localized within the surroundings of the laboratories and not substantial (negligible).

Will there be any potential risk of habitat fragmentation due to the clearing activities? YES NO: **X** _____

Will the project lead to a change in access, leading to an increase in the risk of depleting biodiversity resources? YES _____ NO: **X** _____

Provide an additional description for “yes” answers:

Protected Areas

Does the subproject area or do subproject activities?

Occur within or adjacent to any designated protected areas? YES _____ NO: **X** _____

Affect any protected area downstream of the project? YES _____ NO: **X** _____

Affect any ecological corridors used by migratory or nomadic species located between any protected areas or between important natural habitats (protected or not) (e.g., mammals or birds)? YES _____ NO **X** _____

Provide an additional description for “yes” answers:

Invasive Species

Is the sub-project likely to result in the dispersion of or increase in the population of invasive plants or animals (e.g., along distribution lines)? YES _____ NO: **X** _____

Provide an additional description for a “yes” answer:

B. The Physical Environment

Geology/Soils

Will slope or soil stability be affected by the project? YES _____ NO: **X** _____

Will the subproject cause physical changes in the project area (e.g., changes to the topography)? YES _____ NO **X** _____

Will local resources, such as rocks, wood, sand, gravel be used? YES _____ NO: **X** _____

Could the subproject potentially cause an increase in soil salinity in or downstream the project area? YES _____ NO **X** _____

Could the soil exposed due to the project potentially lead to an increase in lixiviation of metals, clay sediments, or organic materials?

YES _____ NO ☒ _____

Landscape / Aesthetics

Is there a possibility that the sub-project will adversely affect the aesthetics of the landscape?

YES _____ NO: ☒ _____

Pollution

Will the sub-project use or store dangerous substances (e.g., large quantities of hydrocarbons)?

YES _____ NO: ☒ _____

Will the subproject produce harmful substances? YES _____ NO: ☒ _____

Will the subproject produce solid or liquid wastes? YES ☒ _____ NO: ☒ _____

Will the subproject cause air pollution? YES _____ NO: ☒ _____

Will the subproject generate noise? YES ☒ _____ NO _____

Will the subproject generate electromagnetic emissions? YES _____ NO: ☒ _____

Will the subproject release pollutants into the environment? YES ☒ _____ NO _____

The operations of the project will trigger generation of noise and effluent waste which will be localized and mitigated through appropriate measures for waste and noise minimization.

C. The Social Environment

Land Use, Resettlement, and/or Land Acquisition

Describe existing land uses on and around the sub-project area (e.g., community facilities, agriculture, tourism, private property, or hunting areas):

Largely research work in crop and animal aspects. _____

Are there any land use plans on or near the sub-project location, which will be negatively affected by subproject implementation? YES _____ NO: ☒ _____

Are there any areas on or near the subproject location, which are densely populated which could be affected by the sub-project? YES _____ NO: ☒ _____

Are there sensitive land uses near the project area (e.g., hospitals, schools)? YES _____ NO: ☒ _____

Will there be a loss of livelihoods among the population? YES _____ NO: ☒ _____

Will the sub-project affect any resources that local people take from the natural environment? YES _____ NO: ☒ _____

Will there be additional demands on local water supplies or other local resources? YES _____ NO: ☒ _____

Will the sub-project restrict people's access to land or natural resources? YES _____ NO ☒ _____

Will the project require resettlement and/or compensation of any residents, including squatters? YES _____ NO ☒ _____

Will the subproject result in construction workers or other people moving into or having access to the area (for a long-time period and in large numbers compared to permanent residents)? YES ____ NO X

Who is/are the present owner(s)/users of resources/infrastructures the subproject area? ***The site is owned by the institute i.e. CARI especially for research in poultry and piggery enterprises. At household levels, the enterprises will be done within the homesteads.***

Loss of Crops, Fruit Trees, and Household Infrastructure

Will the subproject result in the permanent or temporary loss of:

Crops? **No**

Fruit trees/coconut palms? **No**

Household infrastructure? **No**

Any other assets/resources? **No**

Occupational Health and Safety, Health, Welfare, Employment, and Gender

Is the sub-project likely to safeguard worker's health and safety and public safety (e.g., occupational health and safety issues)?

YES ____ NO X

How will the sub-project minimize the risk of accidents? How will accidents be managed, when they do occur? ***The workers will be provided with PPEs and sensitization before on-set of the project.***

Is the project likely to provide local employment opportunities, including employment opportunities for women? YES ____ ✓ NO ____

Provide an additional description for "yes" answers:

The project will largely be by women who manage chicken at household levels which will provide them avenue for food security and good nutrition through consumption of poultry products as well as income from sale of such products.

Historical, Archaeological, or Cultural Heritage Sites

Based on available sources, consultation with local authorities, local knowledge and/or observations, could the sub-project alter:

Historical heritage site(s) or require excavation near the same? YES ____ NO X

Archaeological heritage site(s) or require excavation near the same? YES ____ NO X

Cultural heritage site(s) or require excavation near the same? YES ____ NO X

Graves, or sacred locations (e.g., fetish trees or stones) or require excavations near the same?

YES ____ NO X

N.B For all affirmative answers (YES) Provide description, possible alternatives reviewed and/or appropriate mitigating measures. ***There will be no excavations anticipated.***

RECOMMENDATIONS

Environmental category: (tick where applicable)

	Category	Justification
	Does not require further environmental or social studies	No
	Requires a full ESIA to be submitted on date	No
	Requires an ESMP to be submitted on date	None
	Requires a RAP to be submitted on date	No
	Requires an Indigenous Peoples Plan (IPP)	No
	Requires a Physical Cultural Resources Plan	No

CERTIFICATION

We certify that we have thoroughly examined all the potential adverse effects of this subproject.

Reviewer:

Name:

Signature:

Date:

8.1.3 SCREENING FORMS REHABILITATION OF WORKSHOPS AT CARI

Please type or print clearly, completing this form in its entirety. You may provide additional information on a separate sheet of paper if necessary. This will guide in the identification and categorization of the project accordingly.

Component under WAATP	Component 1: Strengthening the new model for innovation development in West Africa
Name of Subproject	Subproject 01: Accelerating mass adoption of improved technologies and innovations
Project Development Objective-PDO	The PDO is to accelerate adoption of agricultural improved technologies and innovations by small scale producers and contribute to improve enabling environment for regional market integration in the ECOWAS region and enable the Governments to respond promptly and effectively to eligible emergencies.
Expected Commencement Date	2018
Proposed Main Project Activities	Rehabilitation of the mechanization workshops in CARI
Location (County, District and village)	Lofa, Grand Gedeh, Nimba, Bong, Bomi, River Gee, Margibi, Cape Mont.

BRIEF DESCRIPTION OF THE PROPOSED PROJECT:

DESCRIPTION OF PROCESS THAT COULD BE IMPLEMENTED

Briefly describe the type and nature or type of the project at the site: ***Works will involve remodeling and rehabilitation of mechanization workshops in CARI to enhance functionalities of the workshops to deliver irrigation etc services.***

POTENTIAL ENVIRONMENTAL IMPACTS

Please indicate environmental impacts that may occur as a result of the proposed project.

A. The Biological Environment

The Natural Environment

Describe the habitats and flora and fauna in the project area and in the entire area expected to be affected by the sub-project (e.g., downstream areas, access roads): ***Under this sub-component, the project works will be undertaken within the existing workshops in CARI premises without impacting on neighboring natural ecosystems (forests, swamps, grasslands).***

Will the project directly or indirectly affect?

Natural forest types? **No**

Swamps? **No**

Wetlands (i.e., lakes, rivers, swamps, seasonally inundated areas)? **No**

Natural critical habitats (parks, protected areas)? **No**

Other habitats of threatened species that require protection under Ugandan laws and/or international agreements?

YES _____ NO X _____

Are there according to background research/observations any threatened/ endemic species in the project area that could be affected by the project?

YES _____ NO X _____

Will vegetation be cleared? If yes, please state the distance/length of affected area

YES ✓ _____ NO _____

The clearance will be localized within the surroundings of the workshops and not substantial (negligible).

Will there be any potential risk of habitat fragmentation due to the clearing activities?

YES _____ NO X _____

Will the project lead to a change in access, leading to an increase in the risk of depleting biodiversity resources?

YES _____ NO X _____

Provide an additional description for “yes” answers:

Protected Areas

Does the subproject area or do subproject activities?

Occur within or adjacent to any designated protected areas? YES _____ NO X _____

Affect any protected area downstream of the project? YES _____ NO X _____

Affect any ecological corridors used by migratory or nomadic species located between any protected areas or between important natural habitats (protected or not) (e.g., mammals or birds)?

YES _____ NO X _____

Provide an additional description for “yes” answers:

Invasive Species

Is the sub-project likely to result in the dispersion of or increase in the population of invasive plants or animals (e.g., along distribution lines)? YES _____ NO X _____

Provide an additional description for a “yes” answer:

B. The Physical Environment

Geology/Soils

Will slope or soil stability be affected by the project? YES _____ NO X _____

Will the subproject cause physical changes in the project area (e.g., changes to the topography)?

YES _____ NO X _____

Will local resources, such as rocks, wood, sand, gravel be used? YES ____ NO X

Could the subproject potentially cause an increase in soil salinity in or downstream the project area? YES ____ NO X

Could the soil exposed due to the project potentially lead to an increase in lixiviation of metals, clay sediments, or organic materials? YES ____ NO X

Landscape/Aesthetics

Is there a possibility that the sub-project will adversely affect the aesthetics of the landscape? YES ____ NO X

Pollution

Will the sub-project use or store dangerous substances (e.g., large quantities of hydrocarbons)? YES ____ NO X

Will the subproject produce harmful substances? YES ____ NO X

Will the subproject produce solid or liquid wastes? YES ✓ ____ NO X

Will the subproject cause air pollution? YES ____ NO X

Will the subproject generate noise? YES ✓ ____ NO ____

Will the subproject generate electromagnetic emissions? YES ____ NO X

Will the subproject release pollutants into the environment? YES ✓ ____ NO ____

The risks of noise, generation and release of waste will be during the time of rehabilitation and operations of the workshops but will be day time hours. These risks will be managed through adoption of standard operating procedures for mechanical workshops.

C. The Social Environment

Land Use, Resettlement, and/or Land Acquisition

Describe existing land uses on and around the sub-project area (e.g., community facilities, agriculture, tourism, private property, or hunting areas):

Largely research work in crop and animal aspects. _____

Are there any land use plans on or near the sub-project location, which will be negatively affected by subproject implementation? YES ____ NO X

Are there any areas on or near the subproject location, which are densely populated which could be affected by the sub-project? YES ____ NO X

Are there sensitive land uses near the project area (e.g., hospitals, schools)? YES ____ NO X

Will there be a loss of livelihoods among the population? YES ____ NO X

Will the sub-project affect any resources that local people take from the natural environment? YES ____ NO X

Will there be additional demands on local water supplies or other local resources?

YES _____ NO ☒ _____

Will the sub-project restrict people's access to land or natural resources?

YES _____ NO ☒ _____

Will the project require resettlement and/or compensation of any residents, including squatters?

YES _____ NO ☒ _____

Will the subproject result in construction workers or other people moving into or having access to the area (for a long-time period and in large numbers compared to permanent residents)?

YES _____ NO ☒ _____

Who is/are the present owner(s)/users of resources/infrastructures the subproject area?

_____ The site is owned by the institute i.e. CARI. _____

Loss of Crops, Fruit Trees, and Household Infrastructure

Will the subproject result in the permanent or temporary loss of:

Crops? **No**

Fruit trees / coconut palms? **No**

Household infrastructure? **No**

Any other assets/resources? **No**

Occupational Health and Safety, Health, Welfare, Employment, and Gender

Is the sub-project likely to safeguard worker's health and safety and public safety (e.g., occupational health and safety issues)?

YES ☒ _____ NO _____

How will the sub-project minimize the risk of accidents? How will accidents be managed, when they do occur? The workers will be provided with PPEs

Is the project likely to provide local employment opportunities, including employment opportunities for women? YES ☒ _____ NO _____

Provide an additional description for "yes" answers: ***The project will provide workers with PPEs while working in the workshops and the project will minimize the risk of HIV/AIDS? HIV/AIDS through sensitization and awareness campaigns will be conducted during and rehabilitation and operations of workshops.***

Historical, Archaeological, or Cultural Heritage Sites

Based on available sources, consultation with local authorities, local knowledge and/or observations, could the sub-project alter:

Historical heritage site(s) or require excavation near the same? YES ☒ _____ NO _____

Archaeological heritage site(s) or require excavation near the same? YES ____ NO ____ **X** ____
 Cultural heritage site(s) or require excavation near the same? YES ____ NO ____ **X** ____

Graves, or sacred locations (e.g., fetish trees or stones) or require excavations near the same?
 YES ____ NO ____ **X** ____

N.B For all affirmative answers (YES) Provide description, possible alternatives reviewed and/or appropriate mitigating measures. The excavations will be for foundations of the rehabilitation sites in the project.

RECOMMENDATIONS

Environmental category: (tick where applicable)

	Category	Justification
	Does not require further environmental or social studies	No
	Requires a full ESIA to be submitted on date	No
	Requires an ESMP to be submitted on date	Not required
	Requires a RAP to be submitted on date	No
	Requires an Indigenous Peoples Plan (IPP)	No
	Requires a Physical Cultural Resources Plan	No

CERTIFICATION

We certify that we have thoroughly examined all the potential adverse effects of this subproject.

Reviewer:

Name:

Signature:

Date:

Asbestos Health Risks

Asbestos-containing materials can release fibers into the surroundings due to wear and tear and deterioration or when they are disturbed, damaged or broken. These fibers, when inhaled, may lead to serious lung diseases such as asbestosis (scarring and fibrosis of the lung tissues), *mesothelioma* (a cancer of the lining covering the surface of the lung and inside the chest wall) and lung cancer. The symptoms of these incurable diseases can take up to several years to appear after the first exposure to asbestos dust.

All types of asbestos can be dangerous if disturbed. The danger arises when asbestos fibers become airborne. They form a very fine dust which is often invisible. Breathing asbestos dust can cause serious damage to the lungs and cancer. There is no known cure for asbestos-related disease. The more asbestos dust inhaled, the greater its risk to one's health. Therefore, precautions should always be taken to prevent exposure or where this is not practicable, to keep it to a minimum.

The greater the fiber release, the greater the risk to health it will generate and the higher the standard of precautions required when working with that material. Contractors should take all practicable safety precautions during the three main phases of asbestos removal work, namely when preparing the site, removing the asbestos and cleaning-up of the site after removal.

In view their health risks, care must be taken when removing, dismantling, demolishing, renovating, maintaining and altering structures in buildings containing asbestos. Contractors should take all practicable safety precautions during and when undertaking work involving asbestos. Asbestos removal work should be carried out and supervised by contractor with the supervision of an Occupational Health and Safety Specialist or Environmental Specialist of standing experience.

Removal of Asbestos roof sheets

It is suggested that, the removal of asbestos roof sheets be undertaken as follows:

Preparation at removal site

As part of the preparation for the exercise of removing asbestos, the following have to be undertaken:

- a. Notify CARI staff about the plan to remove and dispose asbestos. It is important all Institute should be made aware of it and be alerted of the plan to de-roof and dispose the asbestos sheets;
- b. Map out or establish asbestos work area in which, risks of exposure to asbestos fibers once disturbed in the removal process are feared could reach. For that case, since the area and premises are well apart, is a safe zone of 50m from either side from the houses roofed with is to be observed;
- c. The site should be secured/horded off with galvanized corrugated iron sheets all around with one entrance that should not face the areas the public frequents;
- a. Post notices on the secured site **“Hazardous Dangerous Waste, Keep Off”**. The warning signs to be posted in the work area be written both in *English and Mande, Kru, and Mel* languages until the work site has been cleaned up and is certified free of any asbestos materials by a qualified Supervisor/Occupational Health and Safety Specialist or approved person with expertise;



Figure 14: Typical barrier sign excluding asbestos removal area

All workers who will be involved in the removal of the asbestos roof materials should be briefed on the nature of work they are to be involved in, requirements in terms of dressing and general conduct of those working on the assignment;



Figure 15: Additional warning sign on health risks from asbestos.



Figure 16: Sample PPEs worn by an asbestos worker

- b. At the same time the site for disposal of the pipes be secured with corrugated galvanized iron-sheets (CGI) and excavation works could be mounted as well;
- c. The pit for the disposal of asbestos pipes has to be excavated measuring 1x3x6m. The wall of the pit will be built of concrete blocks and cemented up to 2m height from bottom. The remaining 1m height should be topped with soil which should be backfilled and compacted under the supervision of an engineer and this process is to continue till soil is back-filled to ground level. It is important to note that, the pit for burial of asbestos up ground level. The size of the pit will be prepared depending on the sizes of the asbestos to be buried;
- d. For safety purposes, those sections of the Research Institute should be rendered inaccessible **out-of-bounds** signs for two weeks to allow effect of removal works and the area to settle thereafter. The area should be cordoned-off with flagging-tapes of clear/visible colors;
- d. Shut down any ventilation and door in the nearby buildings close asbestos work area. All the buildings close by should be vacated for 2 weeks during the removal of the asbestos roof materials;
- e. Set up proper and specific changing and washing facilities for the workers within the enclosed site;

During and after asbestos removal

- a. Before and during asbestos removal, use low-pressure water sprays to wet all asbestos roof sheets. The water should be applied in form of mist or light sprinkle;
- b. Immediately wrap up the removed asbestos pipes in impermeable polyethylene sheets while they are wet. It is best if the sheets are wrapped in a second layer of polyethylene sheets of 1,500g so that, there is little risk of asbestos debris or dust spillage. The wrapped asbestos waste must be affixed with proper warning labels (Figures 17-18).



Figure 17: Possible wrapping of asbestos roof sheets after removal



Figure 18: Bag with broken pieces of asbestos

- c. Wet and collect all broken pieces of asbestos pipe debris in suitable impermeable disposal bags with a double lining. Do not leave them lying around in the work site where they may be further broken or crushed, thus creating more asbestos dust. These bags should also be properly sealed and affixed with proper warning labels;

- d. Break up asbestos pipes that are long to fit into the disposal bags and cannot be wrapped properly. This should be done within the enclosed space work area. Keep the pipes wet throughout the breaking process and put all in a polythene seals;
- e. The breaking/cutting of asbestos be done on a clean canvass sheet which will be wrapped up and buried alongside asbestos roof sheets;
- f. After a day's removal and wrapping of the removed asbestos pipes together with a pack and seal used coveralls in impermeable bags, which are also affixed with proper labels, at the end of each work shift and dispose of together with the asbestos waste for the day; and
- g. Once dropped in the pit, the asbestos waste will be covered with 10cm of cement concrete.

End of the asbestos removal job

- a. All the equipment used in the days removal works, all the equipment and canvass for cutting or breaking pipes will be buried in the disposal pit alongside the pipes so removed that day;
- b. If more pipes remain, they will be removed on subsequent day through the same process as above;
- c. Caution must be borne in mind in that, there should be no overfilling of bags and that, and care should be taken to ensure sharp edges of asbestos do not puncture the plastic bags. Only new bags and heavy-duty 200µm (minimum thickness) polythene sheeting should be used.
- d. The polythene sheeting should be of a height of at least 1.5m and completely wrapping the asbestos sheets. The pack is then sealed with adhesive tape. Packages should be small enough to be handled easily. The packages are then clearly labeled with the asbestos warning mark. The height of this marking should be approximately 75 mm x 90 mm.

Good Practice Note: Asbestos: Occupational and Community Health Issues

1. SUMMARY

The purpose of this Good Practice Note is to increase the awareness of the health risks related to occupational asbestos exposure, provide a list of resources on international good practices available to minimize these risks, and present an overview of some of the available product alternatives on the market. The need to address asbestos-containing materials (ACM) as a hazard is no longer under debate but a widely accepted fact.

Practices regarding asbestos that are normally considered acceptable by the World Bank Group (WBG) in projects supported through its lending or other instruments are addressed in the WBG's General Environmental, Health and Safety (EHS) Guidelines.¹ This Good Practice Note provides background and context for the guidance in the WBG EHS Guidelines.

Good practice is to minimize the health risks associated with ACM by avoiding their use in new construction and renovation, and, if installed asbestos-containing materials are encountered, by using internationally recognized standards and best practices (such as those presented in Appendix 3) to mitigate their impact. In all cases, the Bank expects borrowers and other clients of World Bank funding to use alternative materials wherever feasible.

ACM should be avoided in new construction, including construction for disaster relief. In reconstruction, demolition, and removal of damaged infrastructure, asbestos hazards should be identified and a risk management plan adopted that includes disposal techniques and end-of-life sites.

2. ASBESTOS AND HEALTH RISKS**2.1. What is Asbestos, and Why are We Concerned with its Use?**

Asbestos is a group of naturally occurring fibrous silicate minerals. It was once used widely in the production of many industrial and household products because of its useful properties, including fire retardation, electrical and thermal insulation, chemical and thermal stability, and high tensile strength. Today, however, asbestos is recognized as a cause of various diseases and cancers and is considered a health hazard if inhaled.² The ILO estimates that over the last several decades 100,000 deaths globally have been due to asbestos exposure,³ and the WHO states that 90,000 people die a year globally because of occupational asbestos exposure.⁴

¹ [http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/\\$FILE/Final+-General+EHS+Guidelines.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/$FILE/Final+-General+EHS+Guidelines.pdf) (pp. 71, 91, 94).

² http://www.who.int/occupational_health/publications/draft.WHO.policy.paper.on.asbestos.related.diseases.pdf.

See also Stayner L, et al., "Exposure-Response Analysis of Risk of Respiratory Disease Associated with Occupational Exposure to Chrysotile Asbestos." *Occupational Environmental Medicine*. 54: 646-652 (1997).

³ http://www.ilo.org/wow/Articles/lang--en/WCMS_081341

⁴ http://www.who.int/occupational_health/publications/asbestosrelateddiseases.pdf

Over 90% of asbestos⁵ fiber produced today is chrysotile, which is used in asbestos-cement (A-C) construction materials: A-C flat and corrugated sheet, A-C pipe, and A-C water storage tanks. Other products still being manufactured with asbestos content include vehicle brake and clutch pads, roofing, and gaskets. Though today asbestos is hardly used in construction materials other than asbestos-cement products, it is still found in older buildings in the form of friable surfacing materials, thermal system insulation, non-friable flooring materials, and other applications. The maintenance and removal of these materials warrant special attention.

Because the health risks associated with exposure to asbestos are now widely recognized, global health and worker organizations, research institutes, and some governments have enacted bans on the commercial use of asbestos (see Box 1), and they urge the enforcement of national standards to protect the health of workers, their families, and communities exposed to asbestos through an International Convention.⁶

BOX 1. BANS ON THE USE OF ASBESTOS AND ASBESTOS PRODUCTS

A global ban on commercial use of asbestos has been urged by the Building and Wood Workers Federation (IFBWW), the International Metalworker's Federation, the International Trade Union Confederation, the government of France, and the distinguished scientific group Collegium Ramazzini. All member states of the European Union and over 40 countries worldwide (see Appendix 1) have banned all forms of asbestos, including chrysotile.⁷ In June 2006, the General Conference of the ILO adopted a resolution to "promote the elimination of all forms of asbestos and asbestos-containing materials."

- Landrigan PJ, Soffritti M. "Collegium Ramazzini Call for an International Ban on Asbestos." *Am. J. Ind. Med.* 47: 471-474 (2005).
- The International Ban Asbestos Secretariat keeps track of national asbestos bans. http://ibassecretariat.org/lka_alpha_asb_ban_280704.php
- General Conference of the International Labor Organization, "Resolution Concerning Asbestos," *Provisional Record*, International Labor Conference, Ninety-fifth Session, Geneva, 2006, Item 299, pp. 20/47-48.
- World Health Organization: http://www.who.int/occupational_health/publications/asbestosrelateddiseases.pdf

2.2. Health Concerns Linked to Asbestos-Containing Products

Health hazards from breathing asbestos dust include asbestosis, a lung scarring disease, and various forms of cancer (including lung cancer and mesothelioma of the pleura and peritoneum).⁸ These diseases usually arise decades after the onset of asbestos exposure. Mesothelioma, a signal tumor for asbestos exposure, occurs among workers' family members

⁵ Asbestos defined in Castleman, B. *Asbestos: Medical and Legal Aspects* 5th Ed. New York: Aspen, 2005, 894 pp.

⁶ ILO Asbestos Convention No. 162, (see <http://www.ilo.org/ilolex> or http://www.itcilo.it/actrav/osh_es/m%F3dulos/legis/c162.htm)

⁷ http://www.who.int/occupational_health/publications/asbestosrelateddiseases.pdf. Directive 2003/18/EC of the European Council and Parliament amending Council Directive 83/477/EEC, and Directive 99/77/EEC

⁸ http://www.euro.who.int/document/aicq/6_2_asbestos.pdf

from dust on the workers' clothes and among neighbors of asbestos air pollution point sources.⁹ Some experimental animal studies show that high inhalation exposures to all forms of asbestos for only hours can cause cancer.¹⁰ Very high levels of airborne asbestos have been recorded where power tools are used to cut A-C products and grind brake shoes. For chrysotile asbestos, the most common variety, there is no threshold (non-zero) of exposure that has been shown to be free from carcinogenic risks. Construction materials are of particular concern, because of the large number of workers in construction trades, the difficulty of instituting control measures, and the continuing threat posed by in-place materials that eventually require alterations, repair, and disposal.¹¹ Renovations and repairs in buildings containing A-C materials can also endanger building occupants. In addition to the problems from products made with commercial asbestos, asbestos also occurs as a contaminant in some deposits of stone, talc, vermiculite, iron ore, and other minerals. This can create health hazards for workers and residents at the site of excavation and in some cases in the manufacture and use of consumer products the materials are used to make. While asbestos is a known carcinogen when inhaled, it is not known to be carcinogenic when ingested, as through drinking water,¹² although pipe standards have been issued for asbestos-cement pipes conducting "aggressive" water.¹³

From the industrial hygiene viewpoint, asbestos creates a chain of exposure from the time it is mined until it returns to the earth at landfill or unauthorized disposal site. At each link in the chain, occupational and community exposures coexist. Workers in the mines are exposed to the fibers while extracting the ore; their families breathe fibers brought home on work clothes; workers in the mills and factories process the fiber and manufacture products with it; and their families are also secondarily exposed. Communities around the mines, mills, and factories are contaminated with their wastes; children play on tailings piles and in contaminated schoolyards; transportation of fiber and products contaminates roads and rights-of-way.¹⁴ Tradesmen who install, repair and remove ACM are exposed in the course of their work, as are bystanders in the absence of proper controls. Disposal of asbestos wastes from any step in this sequence not only exposes the workers handling the wastes but also local residents when fibers become airborne because of insufficient covering and erosion control. Finally, in the absence of measures to remove ACM from the waste stream and dispose of them properly, the cycle is often repeated when discarded material is scavenged and reused.¹⁵

⁹ "Asbestos." *World Health Organization IARC Monographs on the Evaluation of Carcinogenic Risks to Humans/Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs 1 to 42*, Suppl. 7. Lyon: International Agency for Research on Cancer, 1987, pp. 106-116.

¹⁰ Wagner JC, Berry G, Skidmore JW, Timbrell V. "The Effects of the Inhalation of Asbestos in Rats." *Br. J. Cancer* 29: 252-269 (1974).

¹¹ International Program on Chemical Safety, "Conclusions and Recommendations for Protection of Human Health," *Chrysotile Asbestos*, Environmental Health Criteria 203. Geneva: World Health Organization, 1998, p. 144.

¹² http://whqlibdoc.who.int/hq/2000/a68673_guidelines_3.pdf

¹³ http://whqlibdoc.who.int/hq/2000/a68673_tech_aspects_4.pdf

¹⁴ Jones, Robert "Living in the Shadow of the Asbestos Hills (The Need for Risk Based Cleanup Strategies for Environmental Asbestos Contamination in South Africa)." Environmental Exposure, Crisis Preparedness and Risk Communication, Global Asbestos Congress, Tokyo, Japan, November 19 - 21, 2004. http://park3.wakwak.com/~gac2004/en/index_abstract_e.html. See also Oberta, AF "Case Study: An Asbestos Cement Plant in Israel -- Contamination, Clean-up and Dismantling." Hellenic Asbestos Conference, Athens, Greece, October 29 - 31, 2002. http://www.ibas.btinternet.co.uk/Frames/f_1ka_hellen_asb_conf_rep.htm

¹⁵ Boer, A.M., L.A. Daal, J.L.A. de Groot, J.G. Cuperus "The Combination of the Mechanical Separator and the Extraction Cleaner Can Process the Complete Asbestos-containing Waste-stream and Make it Suitable for Reuse."

2.3. Increasing Use of Asbestos Fiber

There is evidence that, after a decline in the 1990s, the use of asbestos fiber is increasing globally. A recent study¹⁶ shows that a 59% increase in metric tons was consumed in 12 countries from 2000 to 2004.

3. INTERNATIONAL CONVENTION AND STANDARDS FOR WORKING WITH ASBESTOS

3.1. International Convention

The International Labor Organization (ILO) established an Asbestos Convention (C162) in 1986 to promote national laws and regulations for the “prevention and control of, and protection of workers against, health hazards due to occupational exposure to asbestos.”¹⁷ The convention outlines aspects of best practice: Scope and Definitions, General Principles, Protective and Preventive Measures, Surveillance of the Working Environment, and Workers’ Health. As of March 4, 2008, 31 countries had ratified the Convention;¹⁸ 17 of them have banned asbestos.

Some of the ILO asbestos convention requirements:

- work clothing to be provided by employers;
- double changing rooms and wash facilities to prevent dust from going home on street clothes;
- training of workers about the health hazards to themselves and their families;
- periodic medical examinations of workers,
- periodic air monitoring of the work environment, with records retained for 30 years;
- development of a work plan prior to demolition work, to protect workers and provide for proper waste disposal; and
- protection from “retaliatory and disciplinary measures” of workers who remove themselves from work that they are justified in believing presents a serious danger to health.

Standard considerations for working with and procuring ACM are common to most projects. An overview of some basic ones is provided in Appendix 5.

3.2. International Standards and National Regulations

Standards and regulations for work involving ACM have been published by nongovernmental organizations and government agencies. Appendix 3 provides a listing of some resources, including international organizations (e.g., WHO, ISO, ASTM) and national governments (e.g., UK, US, Canada, South Africa). The resources range from manuals to individual standards and cover a variety of work guidelines, including surveys, identification, inspection, maintenance, renovation, repair, removal, and disposal. Some of the key issues discussed in these standards and regulations are as follows:

European Conference on Asbestos Risks and Management, Rome, Italy, December 4 -6, 2006.

<http://venus.unive.it/fall/menu/Boer.pdf>

¹⁶ R. Virta, US Geological Survey, 2007.

¹⁷ www.ilo.org/ilolex

¹⁸ <http://www.ilo.org/ilolex/english/convdisp1.htm>

- **The scale of occupational hazards.** The health risk is not simply a function of the properties of the ACM, but also reflects the type of work being done and the controls used. Although A-C products, for example, may seem to intrinsically present less of a risk than fire-proofing, air monitoring has shown that cutting dry A-C sheet with a power saw can release far greater amounts of airborne fibers than scraping wet, saturated fireproofing off a beam. The relationship between the nature of A-C products, the work being done and the controls used to control the release of fibers and debris is important (as discussed in ASTM E2394 and HSG189/2¹⁹).
- **Controlling exposure to airborne fibers.** Because asbestos fibers are primarily an inhalation hazard, the basic purpose of the regulations and standards is to control the concentration of asbestos fibers in the air inhaled by workers or others. Concentration limits have been set by regulations in numerous countries for workers whose duties involve contact with ACM; however, they do not purport to totally eliminate the risk of asbestos disease, but only to reduce it. Exposure limits for individuals other than workers, including occupants of buildings and facilities and the community, are lower than those for workers in deference to the very young and old as well as the physically compromised.
- **Measuring exposure to airborne fibers.** Compliance with exposure limits is demonstrated by air sampling in workers' breathing zone or in the space occupied by the affected individuals, with analysis of the sample by optical or electron microscopy, as explained in Appendix 3. Abatement protocols determine whether a building can be reoccupied after asbestos abatement.
- **Proper disposal.** Proper disposal of ACM is important not only to protect the community and environment but also to prevent scavenging and reuse of removed material. ACM should be transported in leak-tight containers to a secure landfill operated in a manner that precludes air and water contamination that could result from ruptured containers. Similar requirements apply to remediation of sites such as mines, mills, and factories where asbestos fiber was processed and products manufactured. (See EPA NESHAP regulations, Appendix 3.)
- **Transboundary movement of waste.** Waste asbestos (dust and fibers) is considered a hazardous waste under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. The Basel Convention imposes use of a prior informed consent procedure for movement of such wastes across international borders. Shipments made without consent are illegal. Parties have to ensure that hazardous waste is disposed of in an environmentally sound manner (ESM). Strong controls have to be applied from the moment of generation, to its storage, transport, treatment, reuse, recycling, recovery and final disposal²⁰.
- **Identifying asbestos products.** A-C products include flat panels, corrugated panels used for roofing, water storage tanks, and pressure, water, and sewer pipes. In some countries asbestos

¹⁹ See Appendix 3.

²⁰ See Basel Convention Secretariat <http://www.basel.int/>

may still be used in making wallboard, heat-resistant gloves and clothes for industrial use, and brake and clutch friction elements and gaskets used in vehicles.²¹ Thermal insulation containing asbestos and sprayed asbestos for insulation and acoustic damping were widely used through the 1970s and should be looked for in any project involving boilers and insulated pipes. Insulation dating from before 1980 should be presumed to contain asbestos unless analyzed and found not to. The microscopic methodology for analyzing bulk samples for the presence of asbestos is widely available in industrialized countries and is not expensive; it is less available in developing countries. In a developing country samples may have to be mailed out for testing; alternatively, training may be available for a laboratory in the country.

Training. It is impossible to overemphasize the importance of training for working with ACM in any capacity—whether it involves inspections, maintenance, removal, or laboratory analysis. The duration of the training as well as the course content depends on the type of work the individual will be doing. Quality control and proficiency testing for laboratories and individual analysts are also important.

5. WORLD BANK GROUP APPROACH TO ASBESTOS HEALTH RISK

The WBG EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP).²⁴ When one or more members of the WBG are involved in a project, the EHS Guidelines are applied as required by their respective policies and standards.

The WBG's EHS Guidelines²⁵ specify that the use of ACM should be avoided in new buildings and construction or as a new material in remodeling or renovation activities. Existing facilities with ACM should develop an asbestos management plan that clearly identifies the locations where the ACM is present, its condition (e.g., whether it is in friable form or has the potential to release fibers), procedures for monitoring its condition, procedures to access the locations where ACM is present to avoid damage, and training of staff who can potentially come into contact with the material to avoid damage and prevent exposure. The plan should be made available to all persons involved in operations and maintenance activities. Repair or removal and disposal of existing ACM in buildings should be performed only by specially trained personnel²⁶ following host country requirements or, if the country does not have its own requirements, internationally recognized procedures.²⁷ Decommissioning sites may also pose a risk of exposure to asbestos that should be prevented by using specially trained personnel to identify and carefully remove asbestos insulation and structural building elements before dismantling or demolition.²⁸

²⁴ Defined as the exercise of professional skill, diligence, prudence, and foresight that would be reasonably expected from skilled and experienced professionals engaged in the same type of undertaking under the same or similar circumstances globally. The circumstances that skilled and experienced professionals may find when evaluating the range of pollution prevention and control techniques available to a project may include, but are not limited to, varying levels of environmental degradation and environmental assimilative capacity as well as varying levels of financial and technical feasibility

²⁵ [http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/\\$FILE/Final+-General+EHS+Guidelines.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/$FILE/Final+-General+EHS+Guidelines.pdf) (pp. 71, 91, 94)

²⁶ Training of specialized personnel and the maintenance and removal methods applied should be equivalent to those required under applicable regulations in the United States and Europe (examples of North American training standards are available at: <http://www.osha.gov/SLTC/asbestos/training.html>)

²⁷ Examples include the ASTM International E1368 - Standard Practice for Visual Inspection of Asbestos Abatement Projects; E2356 - Standard Practice for Comprehensive Building Asbestos Surveys; and E2394 - Standard Practice for Maintenance, Renovation and Repair of Installed Asbestos Cement Products.

²⁸ [http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/\\$FILE/Final+-General+EHS+Guidelines.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/$FILE/Final+-General+EHS+Guidelines.pdf) (pp. 71, 91, 94)

APPENDIX 5. CONSIDERATIONS FOR WORKING WITH ASBESTOS MATERIALS IN EXISTING STRUCTURES

A. Evaluation of alternatives

1. Determine if the project could include the installation, replacement, maintenance or demolition of:
 - Roofing, siding, ducts or wallboard
 - Thermal insulation on pipes, boilers, and ducts
 - Plaster or fireproofing
 - Resilient flooring materials
 - Other potentially asbestos-containing materials
2. If the use of asbestos-containing materials (ACM) has been anticipated for new construction or renovation, provide information about alternative non-asbestos materials and their availability. For new construction, determine the expected difference for the entire project—on initial and operating costs, employment, quality, expected service life, and other factors—using alternatives to ACM (including consideration of the need for imported raw materials).
3. In many cases, it can be presumed that ACM are part of the existing infrastructure that must be disturbed. If there is a need to analyze samples of existing material to see if it contains asbestos, provide information on how and where can that be arranged.
4. Once the presence of ACM in the existing infrastructure has been presumed or confirmed and their disturbance is shown to be unavoidable, incorporate the following requirements in tenders for construction work in compliance with applicable laws and regulations.

B. Understanding the regulatory framework

1. Review the host country laws and regulations and the international obligations it may have entered into (e.g., ILO, Basel conventions) for controlling worker and environmental exposure to asbestos in construction work and waste disposal where ACM are present. Determine how the qualifications of contractors and workers who maintain and remove ACM are established, measured, and enforced.
2. Determine whether licensing and permitting of the work by authorities is required.
3. Review how removed ACM are to be disposed of to minimize the potential for pollution, scavenging, and reuse.
4. Incorporate the following requirements in tenders involving removal, repair, and disposal of ACM.

C. Considerations and possible operational requirements related to works involving asbestos

1. Contractor qualification

- Require that contractors demonstrate having experience and capability to observe international good practice standards with asbestos, including training of workers and supervisors, possession of (or means of access to) adequate equipment and supplies for the scope of envisioned works, and a record of compliance with regulations on previous work.

2. Related to the technical requirements for the works

- Require that the removal, repair, and disposal of ACM shall be carried out in a way that minimizes worker and community asbestos exposure, and require the selected contractor to develop and submit a plan, subject to the engineer's acceptance, before doing so.
- Describe the work in detail in plans and specifications prepared for the specific site and project, including but not limited to the following:
 - Containment of interior areas where removal will occur in a negative pressure enclosure;
 - Protection of walls, floors, and other surfaces with plastic sheeting;
 - Construction of decontamination facilities for workers and equipment;
 - Removing the ACM using wet methods, and promptly placing the material in impermeable containers;
 - Final clean-up with special vacuums and dismantling of the enclosure and decontamination facilities;
 - Disposal of the removed ACM and contaminated materials in an approved landfill;²⁹
 - Inspection and air monitoring as the work progresses, as well as final air sampling for clearance, by an entity independent of the contractor removing the ACM.
- Other requirements for specific types of ACM, configurations and characteristics of buildings or facilities, and other factors affecting the work shall be enumerated in the plans and specifications. Applicable regulations and consensus standards shall be specifically enumerated.

3. Related to the contract clauses³⁰

- Require that the selected contractor provide adequate protection to its personnel handling asbestos, including respirators and disposable clothing.

²⁹ Alternative guidance for circumstances where approved landfills are not available for disposal of hazardous substances, such as asbestos, guidance is provided in the EHS General Guideline, reference above as well as in the Guideline on Waste Management Facilities.
[http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_WasteManagement/\\$FILE/Final+-+Waste+Management+Facilities.pdf](http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_WasteManagement/$FILE/Final+-+Waste+Management+Facilities.pdf)

³⁰ Standard contract clauses for asbestos work exist but are too extensive for this short note. To view an example, the U.S. National Institute of Building Sciences "Asbestos Abatement and Management in Buildings: Model Guide Specification" has a complete set – in copyright form – and the clauses and instructions for using them fill a two-inch binder.

- Require that the selected contractor notifies the relevant authorities of the removal and disposal according to applicable regulations as indicated in the technical requirements and cooperates fully with representatives of the relevant agency during all inspections and inquiries.

4. Related to training and capacity building

- Determine whether specialist industrial hygiene expertise should be hired to assure that local contractors learn about and apply proper protective measures in work with ACM in existing structures.

Originator: World Bank, Operations Policy and Country Services

8.3 ANNEX 3: ENVIRONMENTAL & SOCIAL MONITORING REPORT TEMPLATE

1. Name of subproject:
2. Project Location:
3. Environmental and Social Impacts Brief description of the environmental impacts which were predicted when the project was designed.
4. Environmental and Social Impacts Observed During Field Visit Brief description of the environmental effects observed during the field visit against the predicted effects and level of damage, as well as the unpredicted effects and level of damage
5. Project Compliance of environmental and social policy, laws and regulations Brief description of the project's compliance with environmental specifications and guidelines
6. Results of Field Visit Brief description of the ongoing bio-physical and socio-economic effects against baseline values and past monitoring results
7. Conclusions and Recommendations to Project Management Listing of recommendations for adjustments so that project becomes fully compliant
8. Conclusions and Recommendations to the Monitoring Programme Listing of recommendations for adjustments to the monitoring programme
9. Other Observations:
10. Recommendations and Conclusions
11. Name of Monitor:

Signature: _____ Date: _____
12. Date of Review by ESMT:

Recommended Actions by ESMT
13. Brief summary of discussions and decisions on the issues by ESMT
14. Signed by Safeguards Manager: _____ Date _____

8.4 ANNEX 4: ENVIRONMENTAL RULES FOR CONTRACTORS

These Environmental Rules for Contractors are prepared for all the contractors to be engaged for any WAATP civil works construction activities. The rules include provisions for proper management of construction sites, safe storage of construction materials and safe disposal of wastes. The contractor shall, in all his activities ensure maximum protection of the environment and the socio-economic wellbeing of the people affected by the project, whether within or outside the physical boundaries of the project area.

General Considerations

- a. The contractor shall, in all his activities ensure maximum protection of the environment and the socio-economic wellbeing of the people affected by the project, whether within or outside the physical boundaries of the project area;
- b. Before any construction works begin, the contractor shall ensure that the relevant environmental and land acquisition certificates of authorization for the works have been obtained from Liberia's Environmental Protection Agency and/or Land Commission;
- c. In general, the contractor shall familiarize himself with the ESMF for the WAATP. Specifically, the contractor shall make every effort to follow and implement the recommendations and mitigation measures of the ESMF and any supplemental safeguards document, to the satisfaction of the EPA, World Bank as applicable; and
- d. The contractor shall always keep on site and make available to environmental inspectors or any authorized persons, copies of the ESMF and any other relevant documents for the monitoring and evaluation of environmental and social impacts and the level or progress of their mitigation.

Acquisition of Construction Materials

The contractor shall ensure that construction materials such as sand, quarry stone, soils or any other construction materials are acquired from approved suppliers and that the production of these materials by the suppliers or the contractor does not violate the environmental regulations or procedures as determined by the EPA.

Movement and Transportation of Construction Materials

The movement and transportation of construction materials to and within the construction sites shall be done in a manner that generates minimum impacts on the environment and on the community, consistent with the provisions of the ESMF.

Fencing of Construction sites

Construction sites refer to all areas required for construction purposes, including equipment staging areas. The boundaries of the site shall be demarcated prior to any work commencing on the site. It is the responsibility of the contractor to decide on an appropriate system of protective fencing for the site. The site boundary demarcation fence shall be removed when construction is completed, if appropriate. The Contractor shall ensure that all their equipment and materials remain within the boundaries of the site and he shall ensure that materials used for construction on the site do not blow away or otherwise escape the site.

Storage of Construction Materials and Equipment

Construction materials shall be stored in a manner to ensure that:

- a. There is no obstruction of service roads, passages, driveways and footpaths;

- b. Where it is unavoidable to obstruct any of the service paths, the contractor shall provide temporary or alternate by-passes without inconveniencing the flow of traffic or pedestrians;
- c. There is no obstruction of drainage channels and natural water courses;
- d. There is no contamination of surface water, ground water or the ground;
- e. There is no access by public or unauthorized persons, to materials and equipment storage areas;
- f. There is no access by staff, without appropriate protective clothing, to materials and equipment storage areas; and
- g. Access by staff and public or unauthorized persons, to hazardous, corrosive or poisonous substances including sludge, chemicals, solvents, oils, asbestos cement dust or their receptacles such as boxes, drums, sacks and bags is prohibited.

Solid Waste Management

The Contractor shall institute a waste control and removal system for the site. All wastes shall be disposed of offsite at an approved refuse disposal site in consultation with the EPA. Burning of any waste on any construction site is forbidden. The Contractor shall supply waste bins throughout the site at locations where construction personnel are working.

The bins shall be provided with lids and an external closing mechanism to prevent their contents blowing out and shall be scavenger-proof to keep out any animals that may be attracted to the waste. The Contractor shall ensure that all personnel immediately deposit all waste in the waste bins for removal by the Contractor. Bins shall be emptied on a frequent basis and waste removed to a temporary storage site where it shall be properly contained in water and windproof containers until properly disposed of. The bins shall not be used for any purposes other than waste collection.

In performing his activities, the contractor shall use the best practical means for preventing emissions of noxious or offensive substances into the air, land and water. He shall make every effort to render any such emissions (if unavoidable) inoffensive and harmless to people and the environment. The means to be used for making the emissions harmless or for preventing the emissions shall be in accordance with the ESMF and any other applicable safeguards document, and with the approval of the EPA and (if applicable) relevant Local Authority. Hazardous wastes shall be treated and disposed of in conformity with the national regulations and where applicable, with the supervision of qualified personnel.

Wastewater Management

The Contractor shall construct and operate the necessary collection and treatment facilities for waste water to prevent pollution. In cases where water is mixed with oily waste, separators shall be installed. The oil should be stored in tanks or drums as hazardous waste and disposed of in approved manner. The Contractor shall dispose of collected waste water in a manner agreed with the EPA and respective local officials. The Contractor may discharge "clean" silt laden water overland, preferably vegetated land at the construction site and allow this water to filter into the ground.

However, the Contractor shall ensure that he does not cause soil erosion as a result of any overland discharge. Water from washing operations shall be collected in a sturdy container and disposed of in a manner agreed with EPA. Trucks delivering concrete or other construction supplies or equipment shall not be washed at the project site, nor in any other environmentally sensitive areas. All washing

operations shall take place at a location where wastewater can be disposed of in an acceptable manner. Sanitary wastes shall be disposed into septic tanks.

Stockpiles, Borrow Pits and Quarries

Borrow pits and quarries shall be prohibited where they might interfere with the natural or designed drainage patterns. River locations shall be prohibited if they might undermine or damage the river banks, or require works in the wet area, which may carry too much fine material downstream. The Contractor shall ensure that all borrow pits and quarries are restored, either to their original conditions or to semi-natural habitats that maintain useful conditions for wildlife.

Site Restoration

The Contractor shall ensure that all temporary structures, equipment, materials, and facilities used for construction activities are removed upon completion of the project. Any oil and fuel contaminated soil shall be removed and buried in waste disposal areas. Soak pits and septic tanks shall be covered and effectively sealed off and the sites shall be re-vegetated.

Health and Safety of Workers

The contractor shall protect the health and safety of workers by providing the necessary and approved protective clothing and by instituting procedures and practices that protect the workers from dangerous operations. The contractor shall be guided by and shall adhere to the relevant national labor regulations for the protection of workers. In addition, the contractors should indicate specific measures they will take during construction to prevent HIV/AIDS or other disease transmission by the work force.

Chance Finds Procedures for Physical Cultural Resources

If, during project construction, the contractor or project workers encounter archaeological relics, fossils, human remains, or other items of historical or other cultural value, the Contractor shall:

- a. temporarily suspend any works which might damage these items; and
- b. notify the Supervising Engineer who will then notify the competent authority (Ministry of Cultural Affairs) for guidance regarding the appropriate next steps to evaluate, salvage, recover, protect, and/or document the items found.

Worker Behavior

To help ensure that good environmental and social practices are consistently followed throughout project construction and operation, all workers, operational staff, and contract personnel shall be prohibited from (i) hunting, (ii) fishing, (iii) wildlife capture, (iv) bush-meat purchase, (v) plant collection, (vi) unauthorized vegetation burning, (vii) speeding, (viii) weapons possession (except by security personnel), (ix) working without Personal Protection Equipment (PPE), (x) inappropriate interactions with local people, (xi) disrespecting local customs and traditions, (xii) littering of the site and disposing trash in unauthorized places, (xiii) using alcohol on-site or during working hours, (xiv) sexual harassment, or (xv) setting unauthorized fires of any kind.

8.5 ANNEX 6: SAMPLE TERMS OF REFERENCES FOR ENVIRONMENTAL IMPACT ASSESSMENT

According to both the World Bank's safeguards policies, as well as GoL national laws and regulations, environmental impact assessments (EIAs) are to be conducted for proposed developments that are likely to have significant impacts on the environment and this can be upon preparation of an Environmental and Social Management Framework (ESMF). The EIA should identify potential environmental and social

impacts, and environmental management plans should be prepared to avoid, minimize, mitigation or otherwise compensate those impacts. The EIAs become necessary to be prepared once specific details of the project sites become clear as well as levels of anticipated impacts of the project on the environment arising from a screening process that will be conducted.

These generic terms of reference, which are provided as a sample, should be viewed as a tool of the ESMF and a guide to the preparation of project-specific EAs for all projects, including PPP transactions, under WAATP. Once projects have been selected, these sample ToRs should be modified and tailored to specific project requirements and used as a requirement for the private entity contracted to develop EA documents.

Environmental Impact Assessment Approach

The environmental impact assessment is required to be conducted by licensed EA consultant in Liberia, following the national environmental regulations, guidelines and standards. Meanwhile, it shall also comply with the requirement of the World Bank's Safeguards Policies¹¹.

An initial environmental screening will be (has been) conducted by PCU and approved by the World Bank. It is concluded that the proposed project would have substantial environmental and/or social impact and warrant a Category A classification according to the World Bank Operational Policy 4.01 Environmental Assessment (or the project is a category B project given its moderate and less impact compared to those of Category A projects). According to the Liberia EA classification, the project is subject to full/detailed EA.

The following EA documents shall be prepared and submitted to the EPA for review and approval before commencement of project activities.

These are:

- a. Environmental and Social Impact Assessment Report; and
- b. Environmental Management Plan.

SCOPE OF STUDY

The contents of the EA documents shall follow the requirement of Mongolia Law of EA and the World Bank Operational Policy 4.01 Environmental Assessment. An example Table of Contents (ToC) is attached at the end of this Annex for references. Modification may be needed to adapt to actual project situation.

The following aspects need special attention and should be adequately addressed during preparation of EIA and EMP. These include:

Identification of environmental sensitive sites and key issues

The EIA shall carefully identify and determine the project area of influence first, and identify all the environmental, social and cultural sensitive sites within the project influence areas locally and regionally, with special attention to critical and non-critical habitats, protected areas, physical cultural resources, and human settlement areas and associated facilities etc.

Adequate baseline survey on ecological environment must be conducted through field visit, data collection and consultation with relevant government agencies, NGOs and local public during EA preparation, to identify presences of critical and non-critical habitats, protected areas, protected and endangered wildlife, and key migration routes of wildlife. Any project that may lead to significant conversion or degradation of critical natural habitats (either directly or indirectly) shall be rejected, and alternative locations or alignments must be sought.

Careful screening for physical cultural resources shall be conducted through field survey, consultation with local communities and relevant authorities. Special attention should be paid to archeological and paleontological sites that are considered sacred or have spiritual significance to the local or regional communities, or geological landscapes with special visual aesthetics, and local shrines. Some of them may not have an official protection title, nevertheless, they are considered as physical cultural resources and need to be adequately addressed in EA though proper consultation with stakeholders involved, evaluation of significance, assessment of potential impacts and development of necessary mitigation measures in ESMP.

Residential areas are also sensitive to the potential impact of noise, dust, wastewater, safety, social disturbance and induced development, therefore, warrant careful and thorough investigation, impact assessment and adequate protection in EA process.

Alternative analysis

Alternative analysis shall be conducted for the project strategy (e.g. groundwater or surface water pipelines, road or railway), project site (e.g. power plant, wastewater treatment plant) or alignment (road or railway), technologies adopted (e.g. environmental friendly technology for power plant, or construction methods), etc. Comprehensive comparison shall be carried out for all the alternatives from technical, environmental, social and economic perspective. The final selection should be based on overall optimum consideration among all these factors.

Impact Assessment and Mitigation Measures

As standard practice, the EIA will assess all potential environmental and social impact during project construction and operation and develop feasible mitigation measures for all proposed works.

Major environmental and social impact shall be given adequate attention of assessment, for which necessary mitigation measures shall be developed in ESMP.

These issues include (but not limit to) the following:

- a. Potential conversion or degradation of critical or non-critical natural habitats;
- b. Segregation of natural habitats;
- c. Loss of surface vegetation and biodiversity;
- d. Blocking of wildlife migratory routes;
- e. Lowering and/or depletion of groundwater;
- f. Land degradation and desertification;
- g. Loss or access restriction to livelihood of local herders;
- h. Social and cultural impact on local communities from project operation as well as from induced development;
- i. Noise, dust impact from transport corridor on local communities and wildlife;
- j. Wastewater discharge impact and potential pollution of groundwater;

- k. Public health (e.g. HIV/AIDS) impact due to influx of workforce and induced development;
- l. Induced urbanization impact management
- m. Cumulative impacts
- n. Regional Impacts
- o. Direct and indirect impacts
- p. Other environmental issues related to the operation of the.

Construction related impacts shall also be fully captured by the EA and adequate mitigation measures be developed in the ESMP.

These include (but not limit to):

- a. Construction nuisance of noise and dust impact on construction workers, local communities and wildlife;
- b. Temporary disturbance of wildlife habitats and migratory routes;
- c. Borrow pits and quarry impact and restoration/reclamation;
- d. Construction wastewater impact and management;
- e. Water and soil conservation
- f. Traffic disturbance and safety for local communities;
- g. Hygiene and health concerns of worker camps;
- h. Social impact of influx of workforce, e.g. cultural conflict, STD/HIV/AIDS;
- i. Potential impacts on any physical cultural resources, and development of chance-find procedures

Besides development of mitigation measures for implementation, environmental assessment shall provide valuable input for better project design to avoid or minimize potential environmental and social impact upfront. Though the feasibility study and design has considered a series of environmental, social and technical factors, it is valuable for EA to assess and if necessary recommend to improve the project design in line with the following principles:

- a. Avoid or minimize the need for resettlement of population;
- b. Avoid valuable natural habitats;
- c. Avoid physical cultural resources;
- d. Provision of proper crossing for wildlife migration;
- e. Provision of convenient crossing for herders' livelihood;
- f. Safety design for local community life and livelihood activities;
- g. Reclamation and restoration plans prior to construction;
- h. Environmental enhancement design included in the main project, e.g. creation of offset natural habitats

Environmental and Social Management Plan (ESMP)

An Environmental and Social Management Plan (ESMP) is to be developed in the EIA or as a stand-alone document, serving as a convenient and efficient tool for environmental management manual during project implementation and operation.

The ESMP shall include the following contents:

- **Mitigation measures.** The ESMP shall include all mitigation measures such as avoidance, prevention, reduction, integration, optimization and compensation measures (with as much as possible specifics) for project design, construction and operation stages with clear indication of

responsibility for implementation/supervision, monitoring indicator and frequency, and implementing schedule and budget estimates.

- **Environmental management and supervision structure.** The ESMP shall clearly identify the environmental management and supervision setup, with clear description of environmental management responsibility for all the involved parties, i.e. project management office, project implementing agencies, design institutes, contractors, supervision engineers etc.
- **Institutional capacity.** Appropriate training programs should be designed and incorporated into the project ESMP prior to commencement of operation.
- **Integration of ESMP measures and budget into project implementation contracts**

Public consultation and information disclosure

Public consultation is an integral part of ESIA/ESMP preparation, as required by both GoL environmental laws and the World Bank policies. For category A projects, two rounds of public consultations are required, i.e. (1) public consultation before finalization of ToRs of EIA; and (2) consultation after draft EIA report is available. Public consultation shall be conducted through both formal and informal presentations and meetings with the project affected people, NGOs and relevant stakeholders, government agencies, individual interviews and an opinion survey. For the first round of consultation, the EA consultant/Project owner shall present brief description of the proposed project, potential environmental and social issues, and ESIA approached to address these concerns; for the second round of consultation, the ESIA consultant/project owner shall present to the public the key findings of ESIA and recommendations of mitigation measures to get feedback from public.

The ESIA should include a chapter that summarizes:

- a. the dates and venues of consultation events;
- b. the organizations or stakeholder groups consulted;
- c. the main comments provided, particularly regarding the perceived adequacy of mitigation and monitoring measures;
- d. how the comments and recommendations were or were not taken into account in finalizing project designs; and
- e. feedback mechanisms, including provisions for future consultations throughout project implementation. For category B project, at least one round of public consultation is needed.

The EIA report shall be locally disclosed in places with free accessibility to local public (open offices of city governments, libraries, or internet), with meaningful announcement of such disclosure through local newspaper, or radio/TV, bulletin board posters etc.

a. DELIVERABLES AND TIMETABLE

b. QUALIFICATIONS OF THE CONSULTANT(S)

c. EXAMPLE OF TABLE OF CONTENT (TOC)



Figure 20: Discussions with rice traders at RiverGee roadside stalls



Figure 21: Meeting Cassava growers in Nimba areas



Figure 22: Discussions with the cassava farmers in the field during ESMF preparation mission



Figure 23: Poor cassava harvest in the fields allegedly



Figure 24: Meetings with Pulukpal Group farmers in Margibi




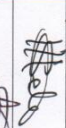


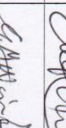









Figure 25: A poultry farmer attending to his chicken.




Figure 26: Meetings with farmers in Bomi areas

Attendance Lists

Preparation of ESMF for West Africa Agricultural Transformation Project (WAATP)

No.	Name	Designation	Organization	Contact	Signature
1.	Edward P. Barid	Mt Office	Shet	0886524003	
2.	Henry H. Sela	Accountant	STAR-P	0886401506	
3.	J. Cyrus Sanyal, Sr.	Project Coordinator	STAR-P	0880828775	
4.	James B. Klatka	Geopuls Officer	STAR-P	08862143265	
5.	Edward G. Wingback	Asst Manager	EPA	0886576150	
6.	David L. Lee	Manager	EPA	0880662716	
7.	Morel Morel Brouard	Coordinator	EPA	0886516788	
8.	Henry D. Mayson	Accountant	CHAP	0775-587096	
9.	ESB S. T. Udon	Head of Fin	CHAP	0886901175	
10.	Jeremiah P. Smith	Data Collector	CHAP	0886932562	
11.	J. Moses Harris	Cashier	CHAP	0776269072	
12.	Bland Clea	Mt Office	CHAP	0886497534	
13.	Marcus Jones	D. G.	CHAP	0777-978335	
14.	Epea Perce	Manager	CHAP	-	
15.	George B. Thomas	Reland	CHAP	088661565	
16.	Samuel Kereah	Reland	CHAP	-	
17.	Ly Ann Stacie	Perce for	CHAP	James	

No.	Name	Designation	Organization	Contact	Signature
18	Flora Kerkela	Raymond from	from	07738318561	Flora Kerkela
19	Gloria Flora	Raymond from	from	0886930873	Gloria Flora
20.	Tyia NDA	Raymond from	from	- - -	Tyia NDA
21.	Nathan Miller	Raymond	from	0886930873	N. Miller
22.	J. Nathan Kollis	Raymond from	from	08813544815	J. Nathan Kollis
22	from, Flora	Raymond	from	- - -	from Flora
22	Nathan Miller	Raymond from	from	- - -	N. Miller
23	Rebecca Kofee	Raymond from	from	0886343853	Rebecca Kofee
24	Julia Kerkela	Raymond from	from	0886124600	Julia Kerkela
25	May Jackson	Raymond	from	- - -	May Jackson
26	Nicole Malach	Raymond	from	- - -	N. Malach
27	Regina Edwards	Raymond	from	- - -	- - -
28	from Womble	Raymond	from	0886930873	- - -
29	Yanah Kelle	Raymond	from	- - -	- - -
29	from Sabar	Raymond from	from	0886205989	- - -
29	Washington Pope	Raymond	from	- - -	- - -
29	Prudence Gony	Raymond	from	- - -	- - -
29	Cecilia Kofee	Raymond	from	0886289932	- - -

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	Ardayale Iqariv	Postgraduate specialist	ITA/SAPSC/MDA	0770021677	
	Michael Sabet	Education Administrator	ITA/SAPSC	0880807646	