SFG2452

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

GHANA PERI-URBAN VEGETABLE VALUE CHAIN PROJECT

MAY, 2016

EXECUTIVE SUMMARY

The Government of Ghana is seeking a US$ 2.85 million equivalent grant support from the International Development Agency, IDA, to implement an agricultural project dubbed: Ghana Peri-urban Vegetable Value Chain for Poverty Reduction. The Project which is horticulturally oriented seeks to improve production and productivity of selected vegetable crops as means to reduce rural poverty, improve livelihood and living standard among peri-urban vegetable producers who are currently constrained with a number of problems including unreliable irrigation water supply, poor capacity and technical know-how, post-harvest losses, poor access to market etc.

Vegetable production is recognized as an integral aspect of Ghana's agricultural system as it is linked not only with the nation's food and nutrition security but also with income generation and employment creation. It is estimated that Africa's daily consumption of fruit and vegetables remains at 100g/person/day as against the FAO and WHO recommended daily intake of at least 400g/person/day (146kg/person/year).

The Project triggers three (3) World Bank Safeguards Policies namely:

- Environmental Assessment OP/BP 4.01;
- Pest Management OP 4.09; and
- Involuntary Resettlement OP/BP 4.12

Since the Project is evolving and a number of sub-projects have not yet been concluded, an Environmental and Social Management Framework (ESMF) is an appropriate tool at this stage of the project.

Purpose of the ESMF

The Environmental Assessment (EA) Regulations - Legislative Instrument (LI) 1652 provides the general framework for the assessment and management of environmental and social safeguards of developments/projects in Ghana. However, since the World Bank is providing the funds, the Project is additionally obliged to comply with the World Bank Safeguards Policy on Environmental Assessment (OP/BP 4.01) which under this Project, an ESMF is deemed an appropriate tool for now because of the following features of the Project:

- A number of sub-projects and components not yet clearly defined;
- Various developmental stages to be carried out in modules;
- Sub-projects spread over a wide geographic area (at least 3 regions);
- Design of the sub-projects and exact locations for implementation, as well as impacts are not yet determined at this stage.

The ESMF spells out the Environmental and Social (E&S) safeguards requirements under the project, institutional arrangements and capacity required to implement the framework. This ensures that sub-projects under the Project meet the national and local E&S requirements, and also consistent with Environmental Assessment OP 4.01, Pest Management OP 4.09 and Involuntary Resettlement OP 4.12 (of the World Bank). The ESMF sets out principles and processes within which the sub-projects are implemented agreeable to all parties. The other objectives of the ESMF include:

Assessment of potential adverse E&S impacts commonly associated with the sub-projects and the way to avoid, minimize or mitigate them;
Establishment of clear procedures and methodologies for the E&S planning, review, approval and implementation of sub-projects;
Development of an Environmental Assessment (EA) screening procedure /initial assessment to be used for sub-projects;
Specification of roles and responsibilities and the necessary reporting procedures for managing and monitoring sub-project E&S concerns, and;
Provide budget estimates and resources required for the implementation of the ESMF.

The Proposed Project

The Projects Development Objective (PDO) is to improve on the productivity and access to market by the beneficiary vegetable farmers in selected peri-urban communities in Ghana. The Project has four (4) key components as follows:
a) Farmer Managed Irrigation Systems Development;
b) Farmer Capacity Development and Support to Productivity Improvement;
c) Improving Post-Harvest Handling and Access to Markets; and
d) Project Management, Monitoring and Evaluation, and Knowledge Dissemination

Policy, Legal, Regulatory and Institutional Framework

The major national policy framework relevant to the Project comprises:

- Ghana National Environmental Policy, 2012;
- Forest and Wildlife Conservation Policy, 2012;
- National Land Policy, 1999;
- Occupational Safety and Health (OSH) Policy of Ghana, Draft 2004;
- National Workplace HIV/AIDS Policy, 2012
- Food and Agriculture Sector Development Policy (FASDEP II), 2007
- National Irrigation Policy, Strategies and Regulatory Measures, 2011;
- Riparian Buffer Zone Policy for Managing River Basins in Ghana, 2011; and
- World Bank Safeguards Policies

Regulatory instruments relevant to the proposed Project include:

- Environmental Assessment Regulations, 1999 (LI 1652;
- Water Use Regulations, 2001 (LI 1692);
- Control and Prevention of Bush Fires Act, 1990 (PNDC 229);
- Labour Act, 2003 (Act 651);
- Fire Precaution (Premises) Regulations, 2003 (LI 1724);
- Factories, Offices and Shops Act 1970, Act 328

Relevant institutional framework comprises:

- Ministry of Food and Agriculture (MoFA);
- Ghana Irrigation Development Authority;
- Ministry of Environment, Science, Technology and Innovation;
- The Environmental Protection Agency (EPA);
- The Water Resources Commission (WRC);

- Ministry of Local Government and Rural Development (MLGRD)

Potential Environmental and Social Impacts

The following major stakeholders were consulted for role identification and for potential environmental and social impacts likely to arise from the Project implementation:

- Environmental Protection Agency (EPA);
- Affected District and Municipal Assemblies;
- Ministry of Health (MoH);
- Project catchment communities;
- Lands Commission (LC);
- Ministry of Food and Agriculture (MoFA);
- Forestry Commission/Wildlife Division (WD);
- Ministry of Environment, Science ,Technology and Innovation (MESTI); and
- NGOs. CBOs
- GIDA

The potential Project facilities to be provided and associated activities will include provision of irrigation facilities, post-harvest infrastructure and agro- processing. The likely associated activities will comprise farmland establishment and expansion, rehabilitation of existing irrigation systems, perimeter road construction, water abstraction, and construction of irrigation canals. The impacts have been categorized into beneficial and adverse impacts.

Beneficial Impacts

Potential beneficial impacts of the Project will include:

- Improved Soil conservation
- Water resources conservation
- Increased farm incomes from crop output
- Food Security
- Poverty alleviation
- Raise rural income
- Improved nutrition
- Employment creation for community members;
- Empowerment of farmers

Adverse Impacts

Anticipated adverse impacts of the Project include:

No	Project and Associated Activities	Potential Environmental and Social Impact/Issues	Environmental significance
1	Irrigation Canal/Semi California System/Ponds	Water pollution; Destruction of flora and fauna habitat;	Moderate Moderate

		Resettlement related issues; Water related diseases; Land take Occupational health and safety issues	Moderate Major Moderate Moderate
2	Access Roads/Perimeter Roads	Dust and noise pollution Water pollution; Solid waste disposal; Waste oil/ fuel disposal; Public health and safety; Traffic congestion; and delays Land take	Major Moderate Moderate moderate Major Minor Minor
3	Vegetable Farm Establishment	Water pollution; Soil erosion; Destruction of flora and fauna habitat; Resettlement related issues; Soil and land degradation; Groundwater pollution; Occupational health and safety issues; Fire management (bush fire)	Major; Major; Moderate Moderate Major Moderate Major Moderate
4	Agro/Vegetable Processing Facilities	Solid waste generation; Occupational health and safety; Water pollution; Noise pollution	Major Major Major Moderate
5	Farmer Cooperative Warehousing System	Occupational health and safety issues;	Major

		Noise and air pollution; Public safety	Major Minor
6	Pesticides	Improper application of pesticide amounts Application in rainy season resulting in ineffective targeting and increased runoff and uptake by soils and water bodies Use of highly toxic chemicals to plants, animals and humans Improper use, contamination by high exposure, no precautionary measures leading to health impacts Details are included in the PMP commissioned separately as required by OP4.09	Major Major Major Major
Social Impacts			
5	General	Cultural dilution; Cultural heritage site; Increase in women work burden; Public health issues; Land take	Moderate Minor Moderate Major Minor

ESMF Implementation

The successful implementation of the ESMF depends on the commitment of MOFA and related institutions, the capacity within the institutions and the appropriate and functional institutional arrangements among others. The MOFA, GIDA, Lands Commission, MESTI, and EPA have been involved in the preparation and the review of the ESMF. The key ESMF implementation areas and the relevant institutional roles as well as the institutional arrangement and collaboration for successful implementation of the ESMF of the Project have been determined and outlined. The E&S monitoring and reporting roles and responsibilities within institutions and among the stakeholders have been mapped out. An Environmental and Social Management

Plan (ESMP), asocial and environmental screening process (see Annex 2 for checklist) for selection and evaluation of the sub-projects are required to manage both environmental and social aspects of these activities, preferably in a participatory manner with beneficiary communities, including women and vulnerable groups. MoFA will use this checklist to screen all potential projects and report accordingly as part of the usual project formulation (feasibility phase) exercise.

Summary of Environmental and Social Screening Process and Responsibility

No	**Stage**	**Institutional Responsibility**	**Implementation Responsibility**
1	Screening of Environmental and Social Infrastructure micro Project to assist in project formulation using checklist	MoFA	Social and Environmental Officer
2	Determination of appropriate environmental and social assessment level/ category	EPA/ MoFA	Social and Environmental Officer
2.1	Selection validation	World Bank	Social and Environmental Officer
3	Implementation of environmental and social assessment	MoFA	Social and Environmental Officer
3.1	If ESIA is necessary		
3.1a	Preparation of terms of reference	MoFA	Social and Environmental Officer
3.1b	Selection of Consultant	MoFA/Procurement Officer	Social and Environmental Officer/ Procurement Officer/ Safeguards specialist
3.1c	Realization of the EIA, Public Consultation and participation. Integration of environmental and social management plan issues in the	MoFA/ Procurement Office/ Consultancy firm/ Contractor	Social and Environmental Officers/ Procurement

	tendering and project implementation,		Officer
4	Review and Approval	EPA/ World Bank	
4.1	ESIA Approval (B1)	EPA/ World Bank	
4.2	Approval simple measures (B2&c)	MOFA	Social and Environmental Officer/ Project manager
5	Participatory Public Consultation and disclosure	MoFA/EPA/ World Bank	EO/Contractor/Consultant
6	Surveillance and participatory monitoring	Implementing agency/EPA/ World Bank/ MoFEP	Social and Environmental Officers/ WB Safeguards specialists
7	Development of participatory monitoring indicators	MOFA	Environmental Officer /Safeguards Consultant

Participatory Monitoring Plans and Indicators

Participatory Monitoring Plans have been developed to support the implementation at the project level. These are given in the report and include description of the impact issues, proposed mitigation actions, monitoring indicators, verification, and responsibilities by all parties involved in the Projects.

Institutional capacity

The capacity building requirements will mostly be in the form of training programs. Training workshops/ seminars on the ESMF/RPF and the World Bank/EPA safeguard policies would be organized for MoFA. The following additional training areas have been identified:

World Bank Safeguard policies and Ghana EPA Environmental Assessment Regulations

- Environmental and Social Screening Checklist
- Completion of EPA EA Registration Forms
- Preparation of Terms of Reference for ESIA
- Environmental and Social Clauses in Contractors' contract and bidding documents.

Public consultation and Participation

Numerous persons and institutions were consulted in the project regions in the process of preparing this ESMF. In addition, three (3) public consultations and participation workshops were held in the Greater Accra, Volta and Western Regions, specifically at the districts where the Project is envisaged to take place. The EPA was fully represented in these meetings and provided assurances of full support to the project. Capacity and gender including the poor and most vulnerable groups' issues were highlighted and suggestions provided for technical training and developmental assistance. Report on community consultation attached as Annex 1

Environmental and Social Impact Mitigation

The table below summarizes the potential impacts of the Project and proposed mitigations:

Summary of Project's Potential Impacts

Impact issues	**Description of mitigation measures**
Physical Environment	
Waste disposal	Solid nontoxic waste • Adequate waste reception facilities should be provided at project sites/camp sites • Final disposal should be at dump sites approved by the local District Assembly • Waste oil /fuel Spent or waste oil from vehicles and equipment should be collected and temporarily stored in drums or containers at site in designated bonded storage areas. Waste oil should be disposed of by oil marketing companies or agents approved or recognized and

	have the capacity to undertake oil disposal • Oil spillages should be soaked with soil and removed from the site for proper disposal • Management of pesticides containers are detailed in the PMP.
Air pollution	• The Projects should require that construction contractors operate only well maintained engines, vehicles, trucks and equipment. A routine maintenance program for all equipment, vehicles, trucks and power generating engines should be in place. If sites are located in close proximity to schools/health clinics, thus include minimization of noise generating activities during day-time hours, in order to comply with EPA guidelines on noise • The project should ensure the use of good quality fuel and lubricants only • If dust generation at the project/construction site becomes a problem, limited wetting of sites and or unloading and reloading points should be done to reduce dust raising • Construction traffic speed control measures should be enforced on unpaved roads (speed limits through communities should be ≤50km/hr on unpaved or untarred roads and near or at project site should be ≤30 km/hr). • Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use.
Noise and vibration	• The Projects should require contractors to use equipment and vehicles that are in good working order, well maintained, and that have some noise suppression equipment (e.g. mufflers, noise baffles) intact and in working order. This will be achieved by making it a component of contractual agreements with the construction contractors. • Contractors will be required to implement best driving practices when approaching and leaving the site (speed limit of ≤30 km/hr) to minimize noise generation created through activities such as unnecessary acceleration and breaking squeal. • Engines of vehicles/trucks and earth-moving equipment should be switched off when not in

	use.
Impacts on Landscape and Visual Receptors	• Project sites should be boarded off from public view during construction • Good house-keeping at construction sites should be ensured
Impact on traffic and Public safety	• Only road worthy vehicles and trucks should be used to avoid frequent breakdowns on the roads • Only experienced drivers should be employed
Water pollution	• No garbage/refuse, oily wastes, fuels/waste oils should be discharged into drains or onto site grounds • Fuel storage tanks/sites should be properly secured to contain any spillage • Maintenance and cleaning of vehicles, trucks and equipment should take place offsite especially where project sites are close to water bodies. • Toilet facilities should be provided for construction workers to avoid indiscriminate defecation in nearby bush or local water bodies • If agrochemicals are used near water bodies the projects should observe the relevant buffer distances and avoid misuse of agrochemicals
Soil and Land degradation	• Minimize land clearing areas as much as possible to avoid unnecessary exposure of bare ground to the elements of the weather • Re-vegetate cleared areas as early as possible • As much as possible, avoid construction work in the rainy season • Erosion minimization technics will be implemented on areas with high risk of erosion (gradient of 25% or more ） • The technologies to be used in land development will be chosen in order to minimize degradation e.g. soil compacting and salinization as a result of over abstraction of water or inappropriate irrigation services.
Impact on fauna and natural habitat	• Projects will not be allowed within legally gazzeted protected areas and critical natural habitats • Avoid unnecessary exposure and access to sensitive fauna habitat areas • For identified or suspected sensitive habitats (swamps/ wetlands), regular inspection or

	monitoring should be carried out in the area prior to start and during work. • If sensitive habitats are encountered, Project activities should cease and the Project should consult Wildlife Division to determine the appropriate course of action. • If the project site is discovered as a sensitive habitat area, the Project should engage the Wildlife Division to develop a suitable plan.
Impacts on water bodies/ Fauna habitat	• The Projects should require that contractors implement a hazardous materials management plan that includes specification for proper storage and handling of fuels, oil, wastes, and other potentially hazardous materials as well as a plan for containment and cleanup of accidental spills into the aquatic environment. • During pre-installation and installation of project facilities, spotting of sensitive aquatic life should form part of the project activities. Should these species be observed in the vicinity of the work area, the project should execute measures to avoid destruction or disturbance. • Project staff must report sightings of any injured or dead aquatic life (fishes) immediately, regardless of whether the injury or death is caused by a Project activity. The report should include the date and location of the animal/strike, and the species identification or a description of the animal. The report should be made to the EPA or Wildlife Division. • The Project workforce and local communities should be educated to ensure that the importance of environmental protection and nature conservation are effectively communicated and that wider appreciation of environmental issues and construction best practice are fostered. • Promote buffer zones along the waterbodies to ensure their integrity and protection of aquatic life forms
Impact on inland water quality	• All Projects should implement a hazardous materials management plan that includes specification for proper storage and handling of fuels, oil, wastes, and other potentially hazardous materials as well as a plan for containment and cleanup of accidental spills into the inland

	water/marine environment. • Marine vessels will be required to adhere to International Maritime Organization (IMO) regulations on bilge and ballast water discharge. • Areas close to water environment that are disturbed during construction activities (such as trench digging) should be rehabilitated as soon as possible after the pipes/cables have been installed. • All rehabilitated areas should be surveyed on weekly basis for the first month after rehabilitation, and a monthly basis for the subsequent five months, to monitor levels of erosion in the vicinity of the development. If observations indicate that significant erosion and sediment transport is taking place (i.e. that rehabilitation has been unsuccessful) additional mitigation should be employed to reduce erosion.
Decommissioning of projects	• Social and Environmental Contract Clauses should be added in bidding documents such as the imperative and conditional agreement to clean up land before handing it over to either the Government/Local community.
Social Issues	
Involuntary displacement	• If possible projects should avoid the physical or economic displacement of any interest groups. • There may be the need to move people or displace their rights to use land as a result of the construction of irrigation canals and farmlands. The Resettlement Action Plan (RAP) will be used to assess and resettle any displaced persons.

Local economy, employment and loss of livelihood	• If a site is acquired, all persons living off the site should be provided with livelihood assistance based on their current income levels or the project should assist such persons obtain new jobs immediately without any loss of income. It should be done in accordance with the Resettlement Policy Framework (RPF); • Contractors should use local labour inclusive of women and vulnerable groups as much as possible and where available. As much as possible, all unskilled labour should be contracted or obtained from the local community; • Animal husbandry is one of main source of local economy. Irrigation canals especially in Dangme East and South Tongu Districts are likely to block cattle grazing, if cattle crossing points are not provided
Deprivation of use of land	• Due process should be followed to establish the true owner of or rights holder over any land, be it family or stool land. Once established, the project should acquire the site by paying appropriate compensation. Recognition of customary land ownership structure that would require putting in measures (participation of community in consultation, dissemination of payment information) to ensure that compensation and lease payments are utilized by communities. The land compensation should be in accordance with the resettlement policy framework (RPF).
Loss of structures/ properties	• For a project site to be used, irrespective of the land compensation, appropriate compensation should be paid to the owner for any structures/ properties which are permanent structures at the site. Depreciation should not be factored during valuation of these properties. The compensation process should satisfy the RPF developed for the project. • Appropriate compensation should be paid for any damaged or destroyed propriety that belongs to affected persons. No depreciation during valuation of these properties.

Impacts on recreation and public areas	• Appropriate notices and warning signs will be erected around working areas and public areas to warn prospective trespassers of any danger or risk
Impacts on human health, safety and sanitation	• Trucks carrying construction materials such as sand, quarry dust, laterite etc., will have the buckets covered with tarpaulin or appropriate polythene material from or to project site • Only road worthy vehicles/trucks should be used • Only experienced drivers/operators should be employed • Except for areas secured by fencing, all active construction areas will be marked with high-visibility tape to reduce the risk accidents involving pedestrians and vehicles. • All open trenches and excavated areas will be backfilled as soon as possible after construction has been completed. Access to open trenches and excavated areas will be secured to prevent pedestrians or vehicles from falling in. • Adequate sanitary facilities will be available for workers and open range defecation will not be countenanced. • Construction workers will be provided with and educated to wear suitable Personal Protective Equipment (PPE) including hard hats, overalls, high-visibility vests, safety boots, earplugs, gloves etc. • The Project will require all contractors to implement an Environmental, Health and Safety (EHS) plan which will outline procedures for avoiding health and safety incidents and for emergency medical treatment. This will be achieved by making it a component of contractual agreement. • All construction and other workers will be sufficiently trained in the safe methods pertaining to their area of work to avoid injuries. • The project will conduct safety training for pesticide handlers and all agricultural workers. The training program will include handling of agro-chemicals, and what to do in the case of

	pesticide exposure.
Impacts on cultural heritage/archaeological interest /existing ecologically sensitive areas	• The pre-construction surveys should identify cultural heritage resources and existing ecologically sensitive areas that the project should avoid and by-pass these resources. • The Project should implement a "chance find" procedure and reporting system to be used by contractors in the event that a cultural heritage feature or ecologically sensitive item/issue is encountered.
Marginalization of women	• Special credit schemes with focus on women • Provide women with labor and time saving machinery through the setting up of plant pools within reach such as districts and communities through the collaboration of the Ministries of Agriculture, Trade and Industry, and Women and Children • Access to improved variety of seeds and seedlings as well as fertilizers and other chemicals needed to improve agricultural methods, should be enhanced by making them affordable to women farmers. • Women farmers must be educated on new variety of crops that are being introduced as well as on other new and improved methods of farming through extension services. • More women extension services workers should be allocated to districts and communities where women farmers predominate as this will enhance their interaction, especially in areas where married women are traditionally barred from being friendly with other men. • Women's time constraints need to be taken into consideration when designing programs for them, be it training or otherwise. • More women participation in consultations and separate women-only meetings to be established. Women- suitable timing for consultations so that attendance does not clash with other priorities.

Community disruption	• Schedule regular meetings with the community • Continuous engagement of communities using Participatory Rural Appraisal (PRA) methods • Implement grievance redress mechanisms
Cultural heritage site	• Take inventory of cultural heritage sites and discuss and agree with community to relocate if necessary
Increase in women work burden	• Education programs on time management should be instituted • Adequate compensation for work done by women
Loss of land for land-poor	• Implement RPF/RAP

LIST OF ABBREVIATIONS

EC	Energy Commission
ESIA	Environmental and Social impacts Assessment
EPA	Environmental Protection Agency
ESMF	Environmental and Social Management Framework
GIDA	Ghana Irrigation Development Authority
GoG	Government of Ghana
IEA	Institute for Economic Affairs
MDAs	Ministries, Departments and Agencies
MOFA	Ministry of Food and Agriculture
NGO	Non-Governmental Organisation
RPF	Resettlement Policy Framework
WB	World Bank
WRC	Water Resources Commission

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1. INTRODUCTION

1. The Government of Ghana is seeking a US$ 2.85 million equivalent grant support from the International Development Agency, IDA, to implement an agricultural project dubbed: Ghana Peri-urban Vegetable Value Chain for Poverty Reduction. The Project which is horticulturally oriented seeks to improve production and productivity of selected vegetable crops as means to reduce rural poverty, improve livelihood and living standard among peri-urban vegetable producers who are currently constrained with a number of problems including unreliable irrigation water supply, poor capacity and technical know-how, postharvest losses, poor access to market etc.

2. Vegetable production is recognized as an integral aspect of Ghana's agricultural system as it is linked not only with the nation's food and nutrition security but also with income generation and employment creation. It is estimated that Africa's daily consumption of fruit and vegetables remains at 100g/person/day as against the FAO and WHO recommended daily intake of at least 400g/person/day (146kg/person/year).

3. In Ghana, the fresh vegetable requirements of the country can be grown and sold locally. Most vegetables are currently produced under rain-fed conditions without irrigation systems, which cause a significant drop in production volume during the dry season. It is estimated that the Ghanaian vegetable farmers are only producing at 50 percent of attainable yields because of the lack of irrigation systems and improved inputs creating a country supply and demand deficit. In rainy seasons where there is usually product glut, farmers experience high post-harvest losses due to lack of processing and storage facilities. External Trade Statistics of Ghana show that large sums of money are spent each year on importing vegetables and vegetable products to augment local production.

4. It is against this backdrop that the proposed Project is crafted to contribute to addressing the constraints of vegetable producers in selected locations within the Greater Accra, Volta and Western Regions of Ghana.

5. The Project triggers three (3) World Bank Safeguards Policies namely:

- Environmental Assessment OP/BP 4.01;
- Pest Management OP 4.09; and
- Involuntary Resettlement OP/BP 4.12

6. It is rated as a Category B project as it is not expected to induce significant adverse environmental and social impacts. Some of the activities such as the rehabilitation of a few small irrigation schemes, construction of processing facilities and other productive sub-projects may, however, have localized but remediable environmental impacts.

7. Since the Project is evolving and a number of sub-projects have not yet been concluded, an Environmental and Social Management Framework (ESMF) is an appropriate tool at this stage of the project. The ESMF takes into consideration the range of project activities and institutional arrangements for project implementation. Specifically, the focus will be on project components

and associated activities and institutional and implementation arrangements for the ESMF.

1.2 Purpose of the ESMF

8. The Environmental Assessment (EA) Regulations - Legislative Instrument (LI) 1652 provides the general framework for the assessment and management of environmental and social safeguards of developments/projects in Ghana. However, since the World Bank is providing the funds, the Project is additionally obliged to comply with the World Bank Safeguards Policy on Environmental Assessment (OP/BP 4.01) which under this Project, an ESMF is deemed an appropriate tool for now because of the following features of the Project:

- A number of sub-projects and components;
- Various developmental stages to be carried out in modules;
- Sub-projects spread over a wide geographic area (at least 3 regions);
- Design of the sub-projects and exact locations for implementation, as well as impacts are not yet determined at this stage.

9. The ESMF spells out the E&S safeguards, institutional arrangements and capacity required to implement the framework. This ensures that sub-projects under the Project meet the national and local E&S requirements, and also consistent with OP 4.01 and OP 4.12 (of the Bank). The ESMF sets out principles and processes within which the sub-projects are implemented agreeable to all parties. The other objectives of the ESMF include:

- Assessment of potential adverse E&S impacts commonly associated with the sub-projects and the way to avoid, minimize or mitigate them;

- Establishment of clear procedures and methodologies for the E&S planning, review, approval and implementation of sub-projects;

- Development of an EA screening/initial assessment system to be used for sub-projects; and

- Specification of roles and responsibilities and the necessary reporting procedures for managing and monitoring sub-project E&S concerns.

1.3 Rationale for the ESMF

10. The Ghana Environmental Assessment Regulation 1999, LI 1652 provides the list of projects for which an Environmental and Social Impact Assessment (ESIA) or Preliminary Environmental Report (PER) is mandatory. Since specific sub-projects have not been clearly identified at this stage, the ESMF provides a general impact identification framework to assist project implementers screen sub-projects and institute measures to address adverse environmental and social impacts. Specific information on the three Project regions, land requirements, bio- physical features etc. when known at a later stage will trigger the preparation of appropriate instrument being either an ESIA or PER.

1.4 Approach for the Preparation of ESMF

11. This ESMF has been prepared following the following activities:

(a) Data Gathering;

(b) Participatory Public consultations and discussions with relevant sector institutions, including non- governmental organizations (NGOs);

(c) Data collection and analysis, consisting of

- ✓ Literature reviews;
- ✓ Environmental and Social screening and scoping studies;
- ✓ Determination of potential impacts;
- ✓ Identification of impacts mitigation measures;
- ✓ Preparation of an Environmental and Social Management Plan; and
- ✓ Preparation of sub-project guidelines;

(d) Workshops;

(e) Review of comments from stakeholders; and

(f) Preparation and Submission of reports.

1.5 Description of Ghana Peri-Urban Vegetable Value Chain Project

12. Vegetable production in Ghana is generally weak despite the huge local market demand for the produce. The industry's contribution in Ghana's economy is well recognized in helping the nation meets its food and nutrition security as well as creating jobs and improvement in living standards among vegetable producers. In the light of this, the Ghana Peri-Urban Vegetable Value Chain for Poverty Reduction Project is created to help address some of the challenges facing the industry and to contribute towards increasing vegetable production and productivity in Ghana.

13. The Projects Development Objective (PDO) is to improve on the productivity and access to market by the beneficiary vegetable farmers in selected peri-urban communities in Ghana. The Project has four (4) key components as follows:

a) Farmer Managed Irrigation Systems Development;

b) Farmer Capacity Development and Support to Productivity Improvement;

c) Improving Post-Harvest Handling and Access to Markets; and

d) Project Management, Monitoring and Evaluation, and Knowledge Dissemination

14. **Component 1**: Farmer Managed Irrigation Systems Development: The objective of the component is to improve the existing small scale riverine irrigation systems for the resource poor farmers in the selected farming communities which are bounded by perennial water bodies with high potential for irrigation farming. The component will address the characteristic seasonality of vegetable production and thus empowering the resource poor farmers to improve their productivity for increased earnings.

15. The component will cover the design and implementation of agriculture irrigation infrastructure. In particular, it will involve the construction of a closed conduit irrigation systems all the way from the water source to the farmers' field. The proposed model, unlike the open canal system which has faced challenges of over irrigation and soil degradation, will enable farmers to have control over the water application and to also shut it off immediately after each irrigation activity. The furrow irrigation technologies will be deployed under the conduit irrigation system. The design will have a network of farms and perimeter roads which will serve for tractor and other transport activities such as for push trucks. Along the roads will be laid the pipes for pond filling and gravity water distribution from the ponds.

16. The component will further organize the farmers in each participating community into 2 or more blocks of producer associations/water users (depending on the number of beneficiaries in each community). Selected members of the Groups in each community will serve on the local project management committee who will ensure faire field water distribution and overall responsibility for the management of the irrigation infrastructure. The component will also develop the requisite capacity for irrigation systems management and it will include organizational management, installation, maintenance and repair of irrigation infrastructure etc.

17. The project will, at every participating community, install one Amiran Farmers Kit (AFK) to demonstrate the technology to farmers. The AFK, which is a greenhouse technology using drip irrigation, has been proven to have high potential to improve on productivity and quality of produce and thus increase in incomes. Due to the cost per kit vis-à-vis the cost per beneficiary however, the project will not immediately introduce the technology on a mass scale to the farmers. It is expected however that as the farmers profit margins increase, they will in themselves begin to invest in the technology to further improve on their yields and hence incomes.

18. **Component 2**: Farmer Capacity Development and Support for Productivity Improvement: The aim of this component is to facilitate the adoption of modern and improved production technologies through sustained farmer capacity development and other support systems. The component will design and implement an intensive farmer capacity development program to ensure that farmers have the know-how and adopt modern vegetable production and post-harvest handling techniques to be able to improve their productivity and output. Both workshop based and field based training including FAO's Famer Field School approaches will be adopted for the farmer capacity development. Training areas will include productivity improvement technologies, appropriate use of chemicals and pesticides, agribusiness management, farm management and farm record keeping accounting financial management, post-harvest handling etc. Relevant themes under the Ghana Good Agricultural Practices (GHANA GAP) will be incorporated into the farmer training program.

19. Capacity development for selected Agriculture Extension Agents (AEAs) in the beneficiary communities who will be directly involved in field activity implementation will also be undertaken. This is to ensure the technical know-how of the selected AEAs is upgraded to effectively provide extension and other support services to the beneficiary farmers and communities. Depending on the number of communities and/or farmers, between 2 to5 AEAs from each of the District Agriculture Development Directorate of MOFA will be assigned to the project to provide extension support services to the farmers and communities.

20. The grant will provide subsidized starter kits (improved seeds, fertilizers, weedicides etc.) to the farmer groups. At the end of the growing season, the farmers will be required to repay the cost of items supplied to them. The repaid amounts will constitute a revolving fund managed by the executives of the farmer groups and saved in local Microfinance Institutions or Community/Rural Banks. The project will support the groups through capacity development (on organizational/planning, revolving fund management, procurement of inputs) to use these revolving funds to procure the inputs for their members in the subsequent growing seasons.

21. **Component 3**: Improving Post-Harvest Handling and Market Access: The project grant will support farmers to enter into productive partnership arrangements with agriculture entrepreneurs to establish and operate a Farmer Cooperative Vegetable Warehousing Systems with cold storage, cleaning, packaging and labelling facilities. The Warehousing System which will be equipped with refrigerated and cold chain transport system will be an essential off-take facility that guarantees ready high value markets for the farmers' produce. Multi-year supply-purchase agreements between the farmer groups and the Warehousing Centre will be facilitated and this will be supported with capacity development for better understanding and adherence to the basic tenants and guiding principles of such systems.

22. The inclusion of the productive partnership entrepreneurs (B-Bovid Limited and Eden Tree Limited) are for strategic reasons. These private enterprises are already well established in the market and have market linkages with supermarkets and restaurants as well as the farmers. They will in addition bring on board their managerial experience to enhance efficiency in the management of the Warehousing System.

23. The farmer groups becoming shareholders in the Warehousing Systems is expected to contribute to reducing and/or mitigating the risk of produce side-selling. It is also to enable the farmers earn additional income to cater for the repair and maintenances of the irrigation infrastructure to be established by project grant. As the profit margins of the Warehousing System improves and farmers earn more income, they can use the additional incomes towards GLOBALGAP Certification to ensure they have the competitive advantage on local vegetables market.

24. The ownership arrangement will be such that the farmer groups will have 37% shareholding while the B-Bovid Ltd and Eden Tree Limited will together hold 63% equity shares. Profits accruing to the farmers groups from their shareholdings will be paid into an dedicated account managed by the executive of the farmer groups, of which withdrawals will be made as to when required to maintain the irrigation infrastructure and to support such activities as the procurement

of inputs for the farmers.

25. The component will specifically co-finance i) the procurement of Vegetable Warehousing Systems Equipment; and ii) training of technician operators.

26. **Component 4**: Monitoring and Evaluation, and Knowledge Dissemination and Project Management and Administration: This component would support all activities necessary to ensure that the project is implemented in accordance with the project implementation manual. This component will: (i) finance the incremental expenses incurred by the Government in implementing the project and finance various monitoring and evaluation roles.

Sub-Component A. Monitoring and Evaluation and Knowledge Dissemination

27. The monitoring and evaluation (M&E) system will be in line with the implementation structure and results measuring framework for the Ghana's Medium Term Agriculture Sector Investment Plan (METASIP). A dedicated M&E team will put together to ensure effective and timely monitoring of progress towards achieving the development objective as set out in the Results Framework. The grant proposal will conduct a baseline survey on key parameters within three to six months of project inception. This will form basis for monitoring of progress and achievement of results. An independent evaluation will be conducted at the end of the project to capture project achievements, experiences and lessons learnt for future guidance. Project Implementation Progress reports will be generated quarterly which will be consolidated into annual reports to be shared with all project stakeholders. The project will document the methodologies and processes, achievements, experiences and lessons learnt and circulated it widely including the websites of MOFA, the World Bank, JSDF and other project partners.

Sub-Component B. Project Management and Administration

28. The ministry of Food and Agriculture will establish a project office at the Crops Services Directorate. A Senior Officer of the Directorate will be assigned to coordinate the day-to-day administrative activities of the project. There will be a Project Steering Committee (PSC) comprising the Directors of Crops Services Directorate, Directorate of Agriculture Extension Services, Women in Agriculture Development Directorate, Ghana Irrigation Development Authority, and Agriculture Engineering Services Directorate of the Ministry as well as collaborating agencies i.e. Food and Drugs Authority and Crops Research Institute. The PSC will meet semi-annually and will serve to provide the overall policy direction to the project.

29. At the decentralized level, the District Agriculture Development Unit of the participating communities will be responsible for field level implementation of activities and will provide agriculture extension services, training and other support services to the beneficiary farmers. 2-5 AEAs and Agriculture Officers in each of the District, depending on the number of farmers in a particular district, will be assigned to provide required support services to the farmers. Staff (including the Regional Crops Officer, Regional Extension Officer, Regional Engineering Officer etc.) from the Regional Directorates of Agriculture in the Greater Accra, Eastern, Volta, Central and Western Regions will from time to undertake backstopping and supervisory visits to farmers and communities under their respective jurisdictions.

2. POLICY, LEGAL, REGULATION AND INSTITUTIONAL FRAMEWORK

30. Relevant polices, legal, regulation and institutional framework relevant to the proposed Project are summarised as follows:

2.1 National and Sector Policy Frameworks

2.1.1 Ghana National Environmental Policy, 2012

31. The Environmental policy seeks to ensure sound management of the environment and sustainable use of resources to avoid irreparable damage to the environment. Preparation of this ESMF and subsequent preparation of ESIA or PER for sub-project activities, when necessary, are all geared towards achieving a sustainable management of the environment and are in in line with this policy.

2.1.2 Forest and Wildlife Conservation Policy, 2012

32. This policy is aimed at conservation and sustainable development of the nation's forest and wildlife resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society. Interventions from the proposed project will be guided by this policy to ensure conservation of the indigenous uses of natural resources. Specifically, the policy will, among others, ensure that the country's permanent estate of forest and wildlife resources are managed and enhanced for preservation of vital soil and water resources, conservation of biological diversity and the environment and sustainable production of domestic and commercial produce. Project components and all sub-project activities are expected to be implemented in a manner that do not harm the nation's forest and its resources.

2.1.3 National Land Policy, 1999

33. The National Land Policy (1999) provides the policy framework, guidelines and action for land administration and land-use in Ghana including land conservation activities as identified under the components of the project. The Policy provides for the full recognition of protected area systems (PAS) and lands outside PAS for ecosystem maintenance and biodiversity conservation

2.1.4 Occupational Safety and Health (OSH) Policy of Ghana, Draft 2004

34. The OSH Policy statement (Draft, 2004) is to prevent accidents and injuries arising out of or linked with or occurring in the course of work, by minimizing as far as reasonably practicable, the cause of the hazards in the working environment and therefore the risk to which employees and the public may be exposed. The engagement of skilled and unskilled workforce at various stages of project implementation reiterates the relevance of the OSH Policy to the proposed project.

2.1.5 National Workplace HIV/AIDS Policy, 2012

35. The general objectives of the Policy among others are to provide protection from discrimination in the workplace to people living with HIV and AIDS; prevent HIV and AIDS spread amongst workers and provide care, support and counselling for those infected and affected. Involvement of persons from different backgrounds in performing various project related activities as a workforce indicate the relevance of this Policy to the intended project

2.1.6 Food and Agriculture Sector Development Policy (FASDEP II), 2007

36. The revised policy (FASDEP II) emphasizes the sustainable utilization of all resources and commercialization of activities in the sector with market-driven growth in mind. It however targets fewer commodities for food security and income diversification, especially of resource poor farmers. Enhancement of productivity of the commodity value chain, through the application of science and technology, with environmental sustainability is emphasized and that makes the Policy very relevant to proposed project.

2.1.7 National Irrigation Policy, Strategies and Regulatory Measures, 2011

37. This policy addresses the problems, constraints and opportunities, which cut across the whole irrigation sub-sector; and specifically for informal, formal and commercial irrigation towards ensuring putting an area of 50,000ha under irrigation in the medium term. Thus the policy is designed to open up the investment space for intensified and diversified irrigated crop production in Ghana where there is clear comparative and competitive advantage. Since the proposed Project involves rehabilitation of few irrigation schemes and formation of Water Users Associations/Groups, it is important that Project activities adhere to the provisions of this Policy and interventions should be synergic to the directives of this Policy.

2.1.8 Riparian Buffer Zone Policy for Managing River Basins in Ghana, 2011

38. This policy is designed to provide comprehensive measures and actions that would guide the coordinated creation of vegetative buffers for the preservation and functioning of water bodies and vital ecosystems in Ghana. It recommends allowable distances or buffer zones around water bodies such as lakes, rivers, stream etc. of which the Project is expected to conform. The recommendations are as follows:

- Municipal reservoir shoreline protective buffer: 60 to 90 meters (e.g. Weija Dam and Lake Bosomtwe);
- Major perennial rivers/streams: 10 to 60 meters (e.g. Volta, Tano, and Offin);
- Minor perennial streams: 10 to 20 meters;
- Important seasonal streams: 10 to 15 meters;
- Streams within forest reserves: 10 to 50 meters; and
- Wetlands: 30- meters around the perimeter as defined from the high water elevation.

2.1.9 World Bank Safeguards Policies

39. The proposed Project triggers three World Bank Safeguards policies and the requirements are summarized in the table below:

Table 1. Triggered World Bank Safeguards Policies

Triggered Safeguards Policy	Requirements	Applicability to the Project
Environmental Assessment	Screen early for potential	An ESMF is required at

(OP 4.01)	impacts and select appropriate instrument to assess, minimize and mitigate potentially adverse impacts	project preparatory stage. Screening of project components and sub-project activities is mandatory during the project implementation stage and that should recommend the need for an ESIA or PER depending of the scale and characteristics of the sub-project activities.
Pest Management (OP 4.09)	Support integrated approaches to pest management. Identify pesticides that may be financed under the project and develop appropriate pest management plan to address risks	The Project is required to develop a Pest Management Plan
Involuntary Resettlement (OP/ BP 4.12)	Assist displaced persons in their effort to improve or at least restore their standards of living. Avoid resettlement where feasible or minimize. Displaced persons should share in project profits	A Resettlement Policy Framework (RPF) is required at project preparatory stage. Early screening of sub-projects should recommend the need for a Resettlement Action Plan (RAP) or an Abbreviated Resettlement Action Plan (ARAP)

40. If policy discrepancy exists between the World Bank Safeguards Policies and the Ghana EPA Assessment Regulations, the more stringent of the policies applies.

2.2 Regulatory Framework

2.2.1 Environmental Assessment Regulations, 1999 (LI 1652)

41. The Environmental Assessment Regulations 1999 (LI 1652) enjoins any proponent or person to register an undertaking with the Agency and obtain an Environmental Permit prior to commencement of the project. The act further gives details of areas considered as sensitive for which undertakings or projects are not allowed.

2.2.2 Water Use Regulations, 2001 (LI 1692)

42. This Acts requires persons or projects intending to abstract water from water bodies such as rivers, lakes, streams, underground etc. for commercial purposes to obtain Water Use Right from

the Water Resources Commission (WRC) prior to embarking on such activities. The rehabilitation of irrigation schemes and construction of dug-outs at project sites in the Western region will require that Water Use Associations/Groups obtain Water Use Right from the WRC. Evidence of having obtained an EPA permit for the proposed undertaking is required by the WRC before issuance of the Water Use Right or permit.

2.2.3 Control and Prevention of Bush Fires Act, 1990 (PNDC 229)

43. This prohibits starting of bushfires intended for any purpose and provides for related matters. This requirement is in tandem with the prohibition of "slash and burn" activities being adopted by the Project. The provision also requires that the Project prohibits hunting of wildlife with fire on farmlands which may cause accidental fires.

2.2.4 Labour Act, 2003 (Act 651)

44. Section 118 (1) of this Act stipulates that it is the duty of an employer to ensure that every worker employed works under satisfactory, safe and healthy conditions. This Act runs concurrently with the Factories, Offices and Shops Act, 1970 (Act 328) and addresses the welfare of workers on the various investor farms. Persons who will be engaged as workers on farmlands and warehouses as a result of this Project are expected to comply with this Act.

2.2.5 Fire Precaution (Premises) Regulations, 2003 (LI 1724)

45. The Fire Precaution (Premises) Regulations 2003 (LI 1724) requires all premises intended for use as workplaces to have Fire Certificates

2.2.6 Factories, Offices and Shops Act 1970, Act 328

46. The Factories, Offices and Shops Act of 1970 (Act 328) requires all proponents to register every factory with the Chief Inspector of Factories Inspectorate Division.

2.3 Institutional Framework

2.3.1 Ministry of Food and Agriculture (MoFA)

47. The Ministry of Food and Agriculture (MoFA) is the ministry responsible for the development and growth of agriculture and food security in the country. The primary roles of this ministry are the formulation of appropriate agricultural policies, planning and coordination, monitoring and evaluation within the overall economic development. The Ghana Irrigation Development Authority (GIDA) which is mandated to lead efforts in irrigation development falls under this ministry

2.3.2 Ministry of Environment, Science, Technology and Innovation

48. The Ministry of Environment, Science, Technology and Innovation exists to establish a strong, national scientific and technology base for accelerated sustainable development of the country to enhance the quality of life for all. The Environmental Protection Agency (EPA) is part of this ministry.

2.3.3 The Environmental Protection Agency (EPA)

49. The EPA was established under the Environmental Protection Agency Act (Act 490 of 1994) as the leading public body responsible for the protection and improvement of the environment in

Ghana. It is responsible for enforcing environmental policy and legislation, prescribing standards and guidelines, inspecting and regulating businesses and responding to emergency incidents. It is responsible for issuing environmental permits and pollution abatement notices for controlling waste discharges, emissions, deposits or others sources of pollutants and issuing directives, procedures or warnings for the purpose of controlling noise. The EPA has the authority to require an ESIA and is responsible for ensuring compliance with ESIA procedures.

2.3.4 Ministry of Local Government and Rural Development (MLGRD)

50. The Ministry of Local Government and Rural Development was established by an Act, 1994 (Act 462) and exists to promote the establishment and development of a vibrant and well-resourced decentralized system of local government for the people of Ghana to ensure good governance and balanced rural based development. The Metropolitan, Municipal and District Assemblies (MMDAs) of the three project regions will exercise local government administrative authority over the Project.

2.3.5 Ghana Irrigation Development Authority (GIDA)

51. GIDA is a semi-autonomous agency of MoFA which is mandated to formulate plans for the development of water resources for irrigation, livestock and fish culture, and execute comprehensive programmes for effective use of irrigated lands in cooperation with other agencies involved in providing extension services to farmers. GIDA is currently undergoing reforms which will position the institution as a regulating body that will regulate irrigation scheme management entities in Ghana including the Water Users Associations/Groups that this Project envisages to use to manage the rehabilitated irrigation facilities.

2.3.6 The Water Resources Commission (WRC)

52. The Water Resources Commission (WRC) was established through Act, 1996 (Act 522). The commission is responsible for regulation and management of the utilization of freshwater resources in the country. The commission does this through granting of water-use rights. The Project and its sub-activities including rehabilitation of irrigation facilities and dug-outs are expected to conform to the requirements of the commission.

2.3.7 Public Institutions involved in Land Administration

53. The institutions include:

- Land Commission
- Land Title Registry
- Survey Department
- Land Valuation Board
- Department of Town and Country Planning
- Office of the Administrator of Stool Lands
- Ministry of Lands and Natural Resources

Customary land

54. Land owned customarily is governed by customary laws prescribed by the local community and therefore varies greatly from place to place. Allodial titles to stool and skin lands are vested in customary authorities and it is the highest right to ownership of land. Revenues from stool

lands are administered by the Office of the Administrator of Stool Lands (OASL). Family land is vested in the head of the family, and is not subject to oversight by OASL. More details on Land acquisition will be provided in the RPF.

Public land

55. State lands have been compulsorily acquired by government for public purposes or in the public interest and administered by the Lands Commission. Vested land is customarily owned but vested in the government which manages it on behalf of the owner (e.g. stool)

2.4 Standards and Guidelines

2.4.1 IFC Performance Standards

56. International Finance Corporation (IFC) applies the Performance Standards to manage social and environmental risks and impacts and to enhance development opportunities in its private sector financing in its member countries eligible for financing.

57. The Performance Standards may also be applied by other financial institutions electing to apply them to projects in emerging markets. Together, the eight Performance Standards establish standards that the client is to meet throughout the life of an investment by IFC or other relevant financial institution:

- Performance Standard 1: Social and Environmental Assessment and Management System
- Performance Standard 2: Labor and Working Conditions;
- Performance Standard 3: Pollution Prevention and Abatement;
- Performance Standard 4: Community Health, Safety and Security;
- Performance Standard 5: Land Acquisition and Involuntary Resettlement;
- Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management;
- Performance Standard 7: Indigenous Peoples;
- Performance Standard8: Cultural Heritage

58. In addition to meeting the requirements under the Performance Standards, clients must comply with applicable national laws, including those laws implementing host country obligations under international law.

2.4.2 EPA Guidelines of Effluent Discharges

59. The EPA of Ghana has guidelines on permissible discharges/effluents allowed into the environment depending on the receiving environment/media. This is attached in Annex 1 of this report.

3. ENVIRONMENTAL AND SOCIAL BASELINE CONDITION OF PROJECT AREAS

60. This section presents a description of the existing environment, comprising the bio-physical and socio-economic conditions of the proposed project area.

3.1 Methodology and Data Collection

61. Various techniques were applied for collecting data on the project environment. These included document review, institutional consultations, focus group discussions and field surveys of the existing environment. An account of the existing physical and biological environment and socio-economic conditions (ethnic groups, culture, economic activities, etc.) were assembled. These formed part of the baseline information and the information obtained used in the environmental analysis/assessment. Samples of the questionnaires and the outcomes of the consultations and stakeholder involvements are attached in the Annex.

62. The description of baseline information relevant to the project covers:

- The project areas;
- Land use categories;
- Land acquisition and tenure system;
- Socio-economic;
- Cultural resources;
- Health;
- Natural resources;
- Wildlife and biodiversity;
- Climate;
- Air Quality;
- Hydrology of the Area；
- Physical environment.

3.2 General

63. The Republic of Ghana is located between latitudes 5^{o} 36'N and longitudes 0^{o} 10'E. It has a total border of 2,093 km, including 548 km with Burkina Faso to the north, 688 km with Côte d'Ivoire to the west, and 877 km with Togo to the east. It has a coastline on the Gulf of Guinea, part of the Atlantic Ocean, measuring 539 km. It has an area of 239,540 Sq km. The country is divided into 10 administrative regions and 170 districts

64. The country is characterized by fairly low relief with few areas of moderate elevation in the north and east. The land is generally 600 meters above sea level. Physiographic regions include the coastal plains, the forest dissected plateau, and high hill tops which are important ecological subsystems in a generally undulating terrain. At the southern and northern margins of the Volta Basin, there are two prominent areas of highland – the Kwahu Plateau, and the Gambaga Escarpment. On the eastern margins of the Volta Basin is a relatively narrow zone of high mountains running in a south-west to north-east direction with the Akwapim, Buem, Togo Ranges registering the highest point (Mt. Afadjato) in the country.

65. Average rainfall over the country is about 1,260 mm/ year, but ranges from 890 mm/year in the coastal zone near Accra to 2,030 mm/year in the southwestern rainforests. The rainfall is bi-modal in the southwestern forest zone, giving a major and a minor growing season; elsewhere, a uni-modal distribution gives a single growing season from May to October. Except for the southwestern zone, the reliability of the rainfall, particularly after crop germination, is a major factor affecting crop growth and agriculture in general.
66. Ghana is drained by three (3) main river systems comprising the Volta, South western and Coastal River Systems. The Volta in Ghana occupies nearly two thirds (70%) of the land area of Ghana, the south western 22% and the minor coastal 8%. The areas covered by the respective river basins are described in the Table below. Global water resources are estimated at 53.2 km3 per year, consisting of 30.3 km3/year of internally produced water resource, and 22.9 km3/year of runoff from other countries.

3.3 South Tongu Project District

3.3.1 Physical Environment
3.3.1.1 Location

Tordzinu, Hikpo, Nutekpo New Bakpa and Hamiditope Project locations

These are located in the South and North Tongu District of the Volta region. The main river draining the district is the Volta, which runs along its western border, but it is also drained by numerous streams, prominent among them being the Chinni and Todzi, with a large number of lagoons in the southern sector of the District. The district falls within the tropical savanna grassland zone of Ghana. The vegetation is characterized by dense thickets and shrubs with short trees along the Volta River and the other streams, and dominated by grasslands with sparsely spread thickets away from the rivers and streams. The grasslands are interspersed mainly by Neem trees Cassia Fan) and Ceiba (Ceiba pentandra). The topography is characterized by vast stretches of Volta flood plains bordering the Volta River on both sides. Within the flood plains, the topography is fairly flat, between 1.5% and 2%. Due to the flat nature and heavy soils, the plains are poorly drained. Along the Volta River, the soils are dominantly medium to moderate textured alluvial soils. Below these the soils are heavier clay soils which are characteristic of most parts of the district. The soils are suitable for vegetable cultivation under irrigation. In addition, the soils are also suitable for the pottery, brick and tile industries.

Sega Akpokope I & II project Locations

Sega Akpokope I & II project sites are located in the Ada East District (formerly Dangme East) of the Greater Accra Region and shares common boundaries with the Central Tongu District to the North, South Tongu District and Ada West District to the East and West respectively. It is bounded to the south by the Gulf of Guinea, by the Volta River South–Eastwards extending to the Gulf of Guinea southwards thereby forming an Estuary. The District forms the central portions of the Accra plains. The relief is generally gently and undulating, a low plain with heights not exceeding 60 meters (200 ft) above sea level. The prominent relief features include the Tojeh boulders rising about 240 meters (800 ft) above sea level. These boulders are scattered

irregularly over the sea. The vegetation is basically the coastal savannah type, characterized by short savannah grasses and interspersed with shrubs and short tress.

Anoe and Ahanta project locations

These project sites are located in the Ahanta West District. The District is found within the South-Western Equatorial Climatic Zone of Ghana the highest mean temperature is 34ºC which is recorded between March and April, while the lowest mean temperature of 20ºC is experienced in August. Relative humidity is very high averaging between 75% to 85% in the rainy season and 70% to 80% in the dry season. The District is located within the wettest region in Ghana. It experiences a double maxima rainfall of over 1,700 millimeters. This abundant rainfall supports agrarian activities in the District. . However, due to the high number of third class roads in the district, accessibility to most parts of the district is thwarted during the rainy season. The District falls largely within the High Rain Forest Vegetation Zone, capturing several hectors of plantation of the rubber plant. To a large extent, this contributes significantly to reducing the problem of global warming, since a chunk of CO2 emissions by the automobile especially, are absorbed. Due to human activities, all the forest except Cape Three Points Forest Reserve which occupies an area of 51.02 square kilometers has been reduced to secondary forest.

The District is generally flat land with a few isolated hills at Butre and Banso with height ranging between 20 to 40 metres above sea level between Cape Three Point and Princess Akatekyi. There is also a plateau at Egyambra. Some of these hills are the sources of some of the rivers in the District. The coastline has features such as capes and bays especially at Cape Three Points. Generally, the soils in the District are very fertile and their types range from loose sand to clay. The table below depicts the various soil types and the crops suitable for cultivation on them. The soil types includes Sandy – Clay – Loam suitable for Cocoa, coffee, citrus, oil palm, rubber and food crops; Moderately well drained clayey loam also suitable for Cocoa, coffee, citrus, oil palm, rubber and food crops; Loamy sand suitable for Maize, vegetables, legumes, and food crops; Silty clay Maize suitable vegetables, legumes, and food crops and sugar cane which is suitable for Loose sand suitable for vegetables and sugar cane and Clay which is also suitable for Vegetables sugar cane and rice

Aklusu Saisi project location

This project location is within the Upper Manya Krobo District Project of the Eastern Region. The district falls within the semi-equatorial climate belt. It has two major seasons, namely the wet and dry seasons. The wet season is from April to early August and from September to October. August is normally dry and cold with November to March being dry and warm. The total amount of rainfall is between 900 mm and 1,150 mm. Relative humidity is high during the wet season between 70% and 80% and low in the dry season about 55% – 60%.

Two major winds affect the climate of the district. These are the wet South-west trade winds which blow across the district from the Atlantic Ocean between March and July and the Northeast trade winds (harmattan) from the Sahara desert between November and early March.

The temperatures are generally high with average ranging between about 26º C and 32º C. The topography of the district can be generally described as undulating. The highest point in the

district is over 660 meters above sea level located in the southern part of Sekesua. The lowest area which is located in the south- eastern part of the district is about 50 meters above sea level. The average height of the land is about 452 meters above sea level. Underlying these landmasses are several rocks or parent rocks from which several rocks have developed.

The district is drained with several rivers such as the Volta, Dawado and Anyaboni. With the exception of the Volta River, almost all these rivers are seasonal with most of them overflowing their banks during the rainy season. The dominant vegetation cover is semi-deciduous forest and derived Savannah zone.

3.3.1.2 Climate Conditions

67. The climate of the South Tongu District is characterized by humid conditions and a bimodal rainfall pattern. The major rainfall season starts from mid-April to early July and the minor rainfall season from September to November. The average annual rainfall varies between 900mm and 1100mm (see Figure 5) with more than 50% of the rain occurring in the major season. The minor season rains are unreliable and may fail in some years. The dry season starts from November extending to March during which only occasional rains are experienced. During the early part of the dry season, the harmattan winds from the Sahara regions blow across the district, drying up seasonal streams and ponds and exposing the vegetation to bushfires.

68. The temperature and relative humidity in the district vary little during the year. The minimum and maximum temperature is 22°C and 33°C respectively, with the mean temperature being 27°C. The average humidity is about 80%. The warmest month is usually March whiles the coolest month is usually August. The variations between day and night temperatures are highest during the dry season between the months of January and February. During this period, the days are very hot and the nights are cold.

69. The bimodal pattern of rainfall influences the cropping pattern in the district, giving rise to two cropping seasons – the major and minor cropping seasons. Rainfall is generally inadequate even during the major season, which affects crop production in the district. The relative humidity is quite conducive for farming.

Figure 1: Mean Annual Rainfall (mm) from 1961-1990 (after Mote, 1998)

3.3.1.3 Surface Water Resources and Drainage

70. The Volta River is the main water body in the South Tongu District. Other rivers which drain the district are the Alabo, Kolo, Aklapka, Gblor, Bla, Anyorgborti and Nyifla streams and their tributaries which flow into the Volta River. Many of these streams are seasonal and dry up during the dry season. During the rainy season however, they sometimes overflow their banks, causing damage to roads and farms.

71. The Volta River is about 70 meters from the western boundary of the project site and will serve as a source of water for irrigation. The Nyifla and Gblor streams are located about 50 meters and 200 meters from the project site respectively.

3.3.1.4 Vegetation and Fauna

72. The project district falls within the tropical savanna grassland zone of Ghana. The vegetation is characterized by dense thickets and shrubs with short trees along the Volta River and the other streams, and dominated by grasslands with sparsely spread thickets away from the rivers and streams. The grasslands are interspersed mainly by Neem trees (Azadirachta indica), Cassia (Senna siamea), Fan palms (Borassus aethiopum) and Ceiba (Ceiba pentandra). The trees serve as important sources of fuelwood for households. Bamboo (Bambusa vulgaris) and Oil palm (Elaeis guineensis) are also quite common along the Volta River and other streams which are used for poles, fencing and in construction. The vast grasslands make the area suitable for cattle grazing which is common in the district. During the dry season, the area is usually burnt to promote the growth of new shoots of grass for cattle. Charcoal production and gathering of fuelwood is also common in the district. These practices are gradually reducing the tree stands in the area.

73. Portions of the project site have been previously farmed and are characterized by short grasses, stands of previously farmed crops (mainly maize), young shrubs and saplings. Figure 2 and 3 below show typical vegetation in the project area.

Figure 2.Typical grassland vegetation at the project district

Figure 3.Typical vegetation along streams at the project site

74. The common fauna in the project district are shown in the Table 2 below:

Table 2. Common Fauna in the Project District

Type	Specie(s)

Birds	Cattle Egret (*Bubulcus ibis*); Hooded Crow (*Corvus albus*); Hooded Vulture (*Necrosyrtes monachus*); Red Kite (*Milvus milvus*);, Black Kite (*Milvus migrans*)
Reptiles	Common Agama (*Agama agama*); Black-necked Spitting Cobra (*Naja nigricollis*); African Egg-eating Snake (*Dasypeltis*); Puff Adder (*Bitis arietans*)
Amphibians	Common Toad (*Amietophrynus regularis*)
Fish	Mudfish (*Claris senegalensis*); Oyster (*Egeria radiata*); Tiger fish (*Hydrocyon radiata*)
Mammals	Grass cutter (*Thryonomys swinderianus*); Gambian Sun Squirrel (*Heliosciurus gambianus*); Typical Striped Grass Mouse (*Lemniscomys striatus*); House Rat (*Rattus rattus*); African Pouched Giant Rat (*Cricetomys gambianus*); West African Ground Squirrel (*Xerus erythropus*)

(Modified from Gbireh, 2015)

3.3.1.5 Topography and Relief

75. The topography is characterised by vast stretches of Volta flood plains bordering the Volta River on both sides. Within the flood plains, the topography is fairly flat, between 1.5% and 2%. Due to the flat nature and heavy soils, the plains are poorly drained.

3.3.1.6 Geology and Soil

76. Along the Volta River, the soils are dominantly medium to moderate textured alluvial soils. Below these the soils are heavier clay soils which are characteristic of most parts of the district. This results in poor surface and sub-surface drainage. Due to this the soils have low water holding capacity making it difficult to cultivate. The soils are shallow, hence have low effective rooting depth. The district abounds in rocks such as igneous and sedimentary rocks in some areas.

77. The soils are suitable vegetable cultivation under irrigation. In addition, the soils are also suitable for the pottery, brick and tile industries.

3.3.1.7 Seismic Activity

78. Ghana is in relatively seismic active region, the great earthquakes in history are M6.5 strong on July 10, 1862 in Accra and M6.8 strong on June 22, 1939 also in Accra. According to the data from Ghana Geological Department, regional active faults as Akwapim Fault Zone and Coastal Boundary fault are main earthquake control structure in Ghana. The above two great earthquakes are associated with the activities of Akwapim Fault Zone and Coastal Boundary Fault. As a result, Magnitude 7 earthquake may happen in Akwapim Fault Zone and Coastal Boundary Fault. They are crossed at Nyannyanu which is about 5 km West of Accra. The design specifications for seismic parameters in Ghana are determined by the seismic zoning map (Figure 4). The zoning map does not define the exceeding probability, and parameter is of the maximum ground acceleration.

79. Southern Ghana is not a highly active seismic area; however, it is a region capable of producing significant earthquakes. The seismic zoning map indicates that the proposed project district falls within a medium to high risk zone. Thus, as a precautionary measure it will be prudent to factor seismic concerns into the designs.

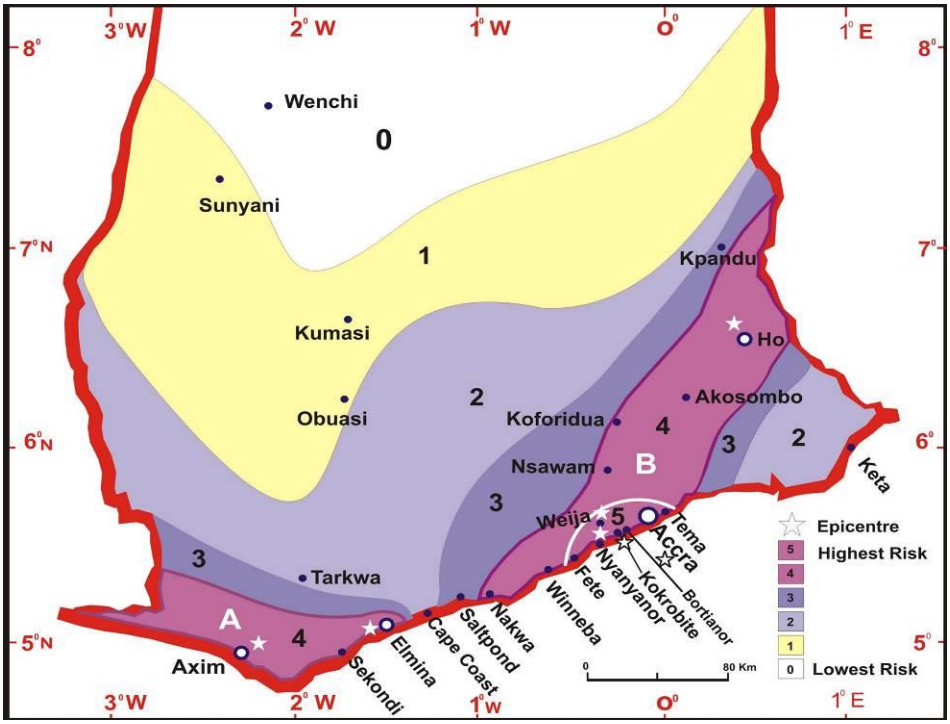

Figure 4. Seismic zoning map of Southern Ghana

3.3.2 Socio-Economic Environment

3.3.2.1 Demographic Characteristics

80. According to the 2010 Population and Housing Census, the total population of South Tongu District in 2010 was 89,777, representing 4.2% of the Volta Region's population and 0.4% of the national population. Females are 47,285 representing 52.7% of the population of the district, with the male population at 42,492 (47.3%). About 60% of the population is in the rural areas. The population of the district is youthful, with 38% of the population in the 0-14 age group, depicting a broad base population pyramid which tapers off with a small number of elderly persons. The districts age dependency ratio is 79.5 dependents (children and old age) for every 100 people working, and the dependency ratios for males and females are 81.9 and 77.5 respectively for every 100 persons in the working ages.

3.3.2.2 Employment and Economy

81. About 66.3% of the population in the South Tongu District aged 15 years and older are economically active whiles 33.7% are not economically active. Of the economically active population, 95.8% are employed while 4.2% are unemployed. More females (55%) are employed as compared to males (45%). For those who are not economically active, a greater percentage of them are in full time education (53.3%); with pensioners being the lowest (1.9%).

82. The economy of the South Tongu District is agrarian with more than half (57.2%) of the employed population engaged in agriculture, forestry and fishery, whiles 15.3% are involved in sales and services. Wholesale, retail, repair of motor vehicles and motorcycles accounts for

12.9% of the employed population, with manufacturing making up 10%. The majority of the employed population engaged in skilled agriculture and fishery are women, constituting 53%. This is similar for those engaged in services and sales with females constituting 82% and males 18%.

3.3.2.3 Agriculture

83. Agriculture is the most important economic activity in the district, with the majority of the employed population engaged in it. However, agriculture in the district is dominated by small-scale farmers who are unorganised and depend mainly on simple labour-intensive production methods. This creates opportunities for nucleus agriculture investor to support the smallholder farmers to increase their productivity and recoup the investments made. The major crops cultivated in the district are maize, cassava, groundnuts, sugarcane, vegetables, cowpea, rice, oil palm and mangoes. Farming is mainly rain-fed.

84. Livestock rearing and fishing are other main economic activities in the district. Fishing serves as the main economic activity among inhabitants along the Volta River. Traditional methods are usually employed for fishing including the use of traps, cast nets and hook and line. Streams and ponds in the district provide avenues for fishing and aqua-culture, however these are heavily silted and overgrown with aquatic weeds.

4. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND SIGNIFICANCE

4.1 Methodology and Impact Identification

85. The potential environmental and social impacts likely to arise as a result of the Project were identified by matching the project components with the surrounding environmental and socio-cultural resources. This section presents both the likely positive and negative impacts that can arise from the Project. Information regarding the social, cultural, natural and coastal resources, etc, was sourced from related literature, visits to the project site and consultation with relevant stakeholders.

86. Stakeholders were identified using a stakeholder identification matrix and were involved in the identification of the potential impacts of the project. The key stakeholders include:

- Lands Commission;
- Environmental Protection Agency (EP A);
- Affected District Assemblies;
- Ministry of Health (MoH);
- Project catchment communities;
- Ministry of Food and Agriculture (MoFA);
- Forestry Commission/Wildlife Division (WD);
- Ministry of Environment, Science and Technology and Innovation (MESTI); and
- NGOs and CBOs.

4.2 Expected Project Activities

87. The potential interactions between various project activities and environmental and social receptors are identified for analysis. At the project phase, these will be evaluated against site-specific conditions using information gathered from existing baseline conditions and site observations. The interactions/project phase activities will be 'screened out' if the potential for impact does not exist or is negligible.

88. The potential Project facilities and associated activities are summarized in the table below. The activities are later assessed for their potential impact on the physical and social environment.

Table 3. Potential Project Areas and Associated Activities

Potential Project Areas	Associated Project and Activities
Irrigation facilities	Construction of a close conduit irrigation systems Water abstraction; Rehabilitation of irrigation canals; Construction of dug-outs or boreholes for irrigation
Farm field establishment and agro-processing	Development of agricultural (vegetable production) fields; Waste treatment and disposal
Ancillary facilities	Construction of perimeter roads

4.3 Project activities and potential environmental and social impacts

The project is associated with many positive impacts which will include:

- Improved Soil conservation
- Water resources conservation
- Increased farm incomes from crop output
- Food Security
- Poverty alleviation
- Raise rural income
- Improved nutrition
- Employment creation for community members
- Empowerment of farmers

Improved Regional Economy

Constructional Phase

89. It is expected that the project will accelerate the pace of regional development. This will occur in both the construction and operational phase of the project. During construction, work on the project will provide market for local goods and service including food and housing. Local businesses will take advantage of the situation to increase the supply of basic goods and services to meet the increase in demand.

90. The trend is expected to continue in the operational phase of the project. A total of 947

farmers including 437 women are targeted for Project support and they will be cultivating a total area of 676.89 hectares. There will be other people engaged in ancillary services in areas such as transport. The influx of migrants into the regions to farm and provide other ancillary services to support the irrigation scheme will expand markets for local goods and services. New business opportunities will also be created for the local people. The expansion of business activities in the districts will enhance the revenue base of the Assemblies through increase receipts from local taxes (tolls) and ground rent. In the long term the project will contribute to the poverty reduction and wealth creation efforts of the beneficiary districts.

Improved National Economy

Operational Phase

91. The Project is expected to reduce deficit in vegetable production in Ghana. Currently most of the locally produced vegetables are done under rain-fed without irrigation systems which cause a significant drop in production volume during the dry season. It is estimated that the Ghanaian vegetable farmers are only producing at 50 percent of attainable yields because of the lack of irrigation systems and improved inputs creating a country supply and demand deficit. In rainy seasons where there is usually product glut, farmers experience high post-harvest losses due to lack of processing and storage facilities. External Trade Statistics of Ghana show that large sums of money are spent each year on importing vegetables and vegetable products to augment local production.

92. The export of fresh vegetables to generate foreign income for the country can be a lucrative enterprise and this has been demonstrated by a few but established exporters in the country. As the Project seeks to boast vegetable production by addressing constraints facing the industry, it is expected that entrepreneurs will capitalise on the opportunities to supply for both local and external markets which will eventually contribute to improving the national economy.

Improved Food Security Profile

Operational Phase

93. Ghana is generally described as food secure. However, the nation's current vegetable production is still 50% below attainable production level and the consumption of the produce, like many other African countries, is about 25% of FAO and WHO recommended daily intake amount. The Project will add to the food stocks in the country and contribute to government's initiatives at securing food and nutritional needs of the country.

Improved Environmental Management

Operational Phase

94. The introduction of scientific methods of farming through sustained extension services and capacity building programmes will ensure good agricultural practices among beneficiary farmers. The effect of these reforms will be minimal land erosion, improved fertility and ultimately higher yields and productivity. The expected output per hectare of the selected crops will compare favourably with achievable yields. This makes the project impact significant localised and long term.

Employment Opportunities and Improved Income Profiles

Constructional Phase

95. During the construction phase, people will be employed directly as labourers, drivers, engineers etc. Women from the local communities will sell food and provide other services for the work force at various sites.

Operational Phase

96. Over 947 farmers of various categories will be working on the irrigated fields when the project is fully operational. Again, the post construction phase will see a rapid influx of migrants into the project area. As in the case of most infrastructure projects in Ghana, women and men engaged in trading activities in the communities within the project zone will experience increase in their daily sales. The existing low levels of income will improve during the operational phase of the project. More importantly, the opportunity to farm three or four times a year as a result of irrigation and using scientific methods of farming and animal husbandry will improve agricultural output and productivity. The marketing and processing models proposed as part of the project activities will reduce marketing bottlenecks. The effect of these interventions is an improved income profile of beneficiary farmers.

4.3 Determination of environmental and social significance of impacts

97. The actual impact significance rating depends on a lot of factors, including:

- the magnitude of the impact;
- the sensitivity and value of the resource or receptor affected;
- compliance with relevant laws, regulations and standards;
- views and concerns of stakeholders;
- overall worker/public comfort; and
- likelihood of occurrence.

4.3.1 Categories of impact significance

A ‘negligible or nil impact’ or an impact of negligible significance is where a resource or receptor will not be affected in any way by a particular activity, or the predicted effect is deemed to be imperceptible or is indistinguishable from natural background levels. A ‘minor impact’ or an impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small and well within accepted standards, and/or the receptor is of low sensitivity/value. In such instances, standard construction/ operational practices can address such impacts. A ‘moderate impact’ or an impact of moderate significance is where an effect will be within accepted limits and standards. Moderate impacts may cover a broad range, from a threshold below which the impact is minor, up to a level that might be just short of breaching an established (legal) limit. In such cases, standard construction practices can take care of these impacts but mitigation measures may also be required. A ‘major impact’ or an impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. In such cases, alternatives are required to address such impacts otherwise mitigation measures should be adopted with strict monitoring protocols.

98. The above classification used in this ESMF is largely subjective, and may be overruled by new site specific issues or information and detailed project activities not captured in this framework.

99. Some of the major potential environmental issues/impacts arising from project activities at the construction, operation and decommissioning stages are listed in the table below.

Table 4. Potential Environmental and Social Impacts and Significant Level

No	Project and Associated Activities	Potential Environmental and Social Impact/Issues	Environmental significance
1	Irrigation Canal/Semi California System/Ponds	Water pollution; Destruction of flora and fauna habitat; Resettlement related issues; Water related diseases; Land take Occupational health and safety issues	Moderate Moderate Moderate Major Moderate Moderate
2	Access Roads/Perimeter Roads	Dust and noise pollution Water pollution; Solid waste disposal; Waste oil/ fuel disposal; Public health and safety; Traffic congestion; and delays Land take	Major Moderate Moderate Moderate Major Minor Minor
3	Vegetable Farm Establishment	Water pollution; Soil erosion; Destruction of flora and fauna	Major; Major; Moderate

		habitat; Resettlement related issues; Soil and land degradation; Groundwater pollution; Occupational health and safety issues; Fire management (bush fire) Pest Management Solid waste generation Land take	 Moderate Major Moderate Major Moderate Moderate Moderate Moderate
4	Agro/Vegetable Processing Facilities	Solid waste generation; Occupational health and safety; Water pollution; Noise pollution	Major Major Major Moderate
5	Farmer Cooperative Warehousing System	Occupational health and safety issues; Noise and air pollution; Public safety	Major Major Minor
Social Impacts			
5	General	Cultural dilution; Cultural heritage site; Increase in women work burden; Public health issues; Land take	Moderate Minor Moderate Major Moderate

4.4 Mitigation considerations and options

100. All moderate and major adverse impacts are considered for mitigation. Specific measures have been suggested in this regard where practicable. With regard to negligible and minor

impacts where the project activity is not expected to cause any significant impact in such cases, best practice measures and mitigation have also been recommended where appropriate to improve the environmental and social performance of the Project.

101. The mitigation options considered include project modification, provision of alternatives, project timing, pollution control, signing of consent agreements with land owners, compensations and relocation assistance. In cases where the effectiveness of the mitigation is uncertain, monitoring programs are introduced.

4.5 Recommended mitigation measures

102. The mitigation measures or guidelines have been designed in order to avoid, minimize and reduce negative environmental and social impacts. The project will conform to the Bank's Environmental, Health and Safety Guidelines. The mitigation measures are presented in the following tables in a descriptive format.

Table 5. Impacts and Mitigation Measures

Impact issues	**Description of mitigation measures**
Physical Environment	
Waste disposal	Solid non-toxic waste • Adequate waste reception facilities should be provided at project sites/camp sites • Final disposal should be at dump sites approved by the local District Assembly Waste oil /fuel Spent or waste oil from vehicles and equipment should be collected and temporarily stored in drums or containers at site Waste oil should be disposed of by oil marketing companies or agents approved or recognized and have the capacity to undertake oil disposal
Air pollution	• The Projects should require that construction contractors operate only well maintained engines, vehicles, trucks and equipment. A routine maintenance program for all equipment, vehicles, trucks and power generating engines should be in place. If sites are located nearby schools/health clinic, thus include minimization of noise generating activities during day-time hours • The project should ensure the use of good quality fuel and lubricants only • If dust generation at the project/construction site becomes a problem, limited wetting of sites and or unloading and reloading points should be

	done to reduce dust raising • Construction traffic speed control measures should be enforced on unpaved roads (speed limits through communities should be ≤50km/hr on unpaved or untarred roads and near or at project site should be ≤30 km/hr). • Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use.
Noise and vibration	• The Projects should require contractors to use equipment and vehicles that are in good working order, well maintained, and that have some noise suppression equipment (e.g. mufflers, noise baffles) intact and in working order. This will be achieved by making it a component of contractual agreements with the construction contractors. • Contractors will be required to implement best driving practices when approaching and leaving the site (speed limit of ≤30 km/hr) to minimize noise generation created through activities such as unnecessary acceleration and breaking squeal • Appropriate PPEs should be provided and used • • Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use.
Impacts on Landscape and Visual Receptors	• Project sites should be boarded off from public view during construction • Good house-keeping at construction sites should be ensured
Impact on traffic and Public safety	• Only road worthy vehicles and trucks should be used to avoid frequent breakdowns on the roads • Only experienced drivers should be employed
Water pollution	• No garbage/refuse, oily wastes, fuels/waste oils should be discharged into drains or onto site grounds • Fuel storage tanks/sites should be properly secured to contain any spillage • Maintenance and cleaning of vehicles, trucks and equipment should take place offsite especially where project sites are close to water bodies. • Toilet facilities should be provided for construction workers to avoid indiscriminate

	defecation in nearby bush or local water bodies
Soil and Land degradation	• Minimize land clearing areas as much as possible to avoid unnecessary exposure of bare ground to the elements of the weather • Revegetate cleared areas as early as possible • As much as possible, avoid construction work in the rainy season
Impact on fauna and habitat	• Avoid unnecessary exposure and access to sensitive fauna habitat areas • For identified or suspected sensitive habitats (swamps/ wetlands), regular inspection or monitoring should be carried out in the area prior to start and during work. • If sensitive habitats are encountered, Project activities should cease and the Project should consult Wildlife Division to determine the appropriate course of action. • If the project site is discovered as a sensitive habitat area, the Project should engage the Wildlife Division to develop a suitable plan.
Impacts on water bodies/ Fauna habitat	• The Projects should require that contractors implement a hazardous materials management plan that includes specification for proper storage and handling of fuels, oil, wastes, and other potentially hazardous materials as well as a plan for containment and cleanup of accidental spills into the aquatic environment. • During pre-installation and installation of project facilities, spotting of sensitive aquatic life should form part of the project activities. Should these species be observed in the vicinity of the work area, the project should execute measures to avoid destruction or disturbance. • Project staff must report sightings of any injured or dead aquatic life (fishes) immediately, regardless of whether the injury or death is caused by a Project activity. The report should include the date and location of the animal/strike, and the species identification or a description of the animal. The report should be made to the EPA or Wildlife Division. • The Project workforce and local communities should be educated to ensure that the importance of environmental protection and nature conservation are effectively communicated and

	that wider appreciation of environmental issues and construction best practice are fostered.
Impact on inland water quality	• All Projects should implement a hazardous materials management plan that includes specification for proper storage and handling of fuels, oil, wastes, and other potentially hazardous materials as well as a plan for containment and cleanup of accidental spills into the inland water/marine environment. • Marine vessels will be required to adhere to International Maritime Organization (IMO) regulations on bilge and ballast water discharge. • Areas close to water environment that are disturbed during construction activities (such as trench digging) should be rehabilitated as soon as possible after the pipes/cables have been installed. • All rehabilitated areas should be surveyed on weekly basis for the first month after rehabilitation, and a monthly basis for the subsequent five months, to monitor levels of erosion in the vicinity of the development. If observations indicate that significant erosion and sediment transport is taking place (i.e. that rehabilitation has been unsuccessful) additional mitigation should be employed to reduce erosion.
Decommissioning of projects	• Social and Environmental Contract Clauses should be added in bidding documents such as the imperative and conditional agreement to clean up, restore and improve the aesthetic value of land before handing it over to either the Government/Local community.
Social Issues	
Involuntary displacement	• There may be the need to move people or displace their rights to use land as a result of the construction of irrigation canals and farmlands. • If possible projects should avoid the physical or economic displacement of any interest groups. • The Resettlement Action Plan (RAP) will be used to assess and resettle any displaced persons.

Local economy, employment and loss of livelihood	• If a site is acquired, all persons living off the site should be provided with livelihood assistance based on their current income levels or the project should assist such persons obtain new jobs immediately without any loss of income. It should be done in accordance with the Resettlement Policy Framework (RPF); • Contractors should use local labor inclusive of women and vulnerable groups as much as possible and where available. As much as possible, all unskilled labor should be contracted or obtained from the local community; • Animal husbandry is one of main source of local economy. Irrigation canals especially in Dangme East and South Tongu Districts are likely to block cattle grazing, if cattle crossing points are not provided
Deprivation of use of land	• Due process should be followed to establish the true owner of or rights holder over any land, be it family or stool land. Once established, the project should acquire the site by paying appropriate compensation. Recognition of customary land ownership structure that would require putting in measures (participation of community in consultation, dissemination of payment information) to ensure that compensation and lease payments are utilized by communities. The land compensation should be in accordance with the resettlement policy framework (RPF).
Loss of structures/ properties	• For a project site to be used, irrespective of the land compensation, appropriate compensation should be paid to the owner for any structures/ properties which are permanent structures at the site. Depreciation should not be factored during valuation of these properties. The compensation process should satisfy the RPF developed for the project. • Appropriate compensation should be paid for any damaged or destroyed propriety that belongs to affected persons. No depreciation during valuation of these properties.

Impacts on recreation and public areas	• Appropriate notices and warning signs will be erected around working areas and public areas to warn prospective trespassers of any danger or risk
Impacts on human health, safety and sanitation	• Trucks carrying construction materials such as sand, quarry dust, laterite etc., will have the buckets covered with tarpaulin or appropriate polythene material from or to project site • Only road worthy vehicles/trucks should be used • Only experienced drivers/operators should be employed • Except for areas secured by fencing, all active construction areas will be marked with high-visibility tape to reduce the risk accidents involving pedestrians and vehicles. • All open trenches and excavated areas will be backfilled as soon as possible after construction has been completed. Access to open trenches and excavated areas will be secured to prevent pedestrians or vehicles from falling in. • Adequate sanitary facilities will be available for workers and open range defecation will not be countenanced. • Construction workers will be provided with and educated to wear suitable Personal Protective Equipment (PPE) including hard hats, overalls, high-visibility vests, safety boots, earplugs, gloves etc. • The Project will require all contractors to implement an Environmental, Health and Safety (EHS) plan which will outline procedures for avoiding health and safety incidents and for emergency medical treatment. This will be achieved by making it a component of contractual agreement. • All construction and other workers will be sufficiently trained in the safe methods pertaining to their area of work to avoid injuries.
Impacts on cultural heritage/archaeological interest /existing ecologically sensitive areas	• The pre-construction surveys should identify cultural heritage resources and existing ecologically sensitive areas that the project should avoid and by-pass these resources.

	• The Project should implement a "chance find" procedure and reporting system to be used by contractors in the event that a cultural heritage feature or ecologically sensitive item/issue is encountered.
Marginalization of women	• Special credit schemes with focus on women • Provide women with labor and time saving machinery through the setting up of plant pools within reach such as districts and communities through the collaboration of the Ministries of Agriculture, Trade and Industry, and Women and Children • Access to improved variety of seeds and seedlings as well as fertilizers and other chemicals needed to improve agricultural methods, should be enhanced by making them affordable to women farmers. • Women farmers must be educated on new variety of crops that are being introduced as well as on other new and improved methods of farming through extension services. • More women extension services workers should be allocated to districts and communities where women farmers predominate as this will enhance their interaction, especially in areas where married women are traditionally barred from being friendly with other men. • Women's time constraints need to be taken into consideration when designing programs for them, be it training or otherwise. • More women participation in consultations and separate women-only meetings to be established. Women- suitable timing for consultations so that attendance does not clash with other priorities.
Community disruption	• Schedule regular meetings with the community • Continuous engagement of communities using Participatory Rural Appraisal (PRA) methods • Implement grievance redress mechanisms
Cultural heritage site	• Take inventory of cultural heritage sites and discuss and agree with community to relocate if necessary

Increase in women work burden	• Education programs on time management should be instituted • Adequate compensation for work done by women
Loss of land for land-poor	• Implement RPF/RAP

5. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

103. Environmental and social planning, implementation and management are undertaken by MOFA for its development projects to cover environmental and social assessment (ESA) and the pre-project/project planning processes. Key stages of the ESA include proposal screening, ESIA and mitigation measures, while the pre-project/planning process involves project concept, identification, design and appraisal. The ESA process links up with the pre-project/planning process signifying the importance of the two processes (i.e. EA and feasibility) to influence one another in the development of the Project. In the context of the ESMF, environmental and social planning identifies and assesses the potential concerns and implications that may arise with the implementation of the Project, in order to influence the design and other engineering feasibility options and decisions, for informed and sustainable project development. The successful implementation of the ESMF depends on the commitment of MOFA and related institutions, the capacity within the institutions and the appropriate and functional institutional arrangements among others.

104. The MOFA, Lands Commission, and EPA as well as MEST were identified as directly associated with the preparation, review and the implementation of the ESMF. The Ministry of Food and Agriculture (MoFA), Wildlife Division (WD), Lands Commission (LC) and the project communities were involved for their inputs regarding the appropriate environmental, social and health safeguards to be observed when the sub-projects are being implemented. The contractor(s) to be employed to undertake construction works will also have a role to play in the implementation of the sub-projects. This section addresses the following key areas of the ESMF implementation:

- Roles of Key Stakeholders in the ESMF implementation;
- Capacity building;
- Environmental and social monitoring and reporting; and
- ESMF implementation budget.

105. Thus the ESMF implementation provides guidance on procedures to be followed and standards to be met in implementing the Project which should be in agreement with national and World Bank safeguard provisions. Roles and responsibilities are clearly defined as well as monitoring protocols to be followed to ensure that the required provisions are adhered to. Finally, budgetary estimates are provided to support the implementation of the environmental and social management plan.

5.1 The Environmental and Social Screening Process

106. A screening process, selection and evaluation of the Projects are required to manage environmental and social aspects of these activities. The extent of environmental assessment that might be required prior to the commencement of the projects will depend on the outcome of the screening process (see checklist in Annex 4). MoFA will use this checklist to screen all potential projects and report accordingly as part of the usual project formulation (feasibility phase) exercise.

107. The purpose of the screening process is to determine whether projects are likely to have potential negative environmental and social impacts; to determine appropriate mitigation measures for activities with adverse impacts; to incorporate mitigation measures into the project design; to review and approve projects proposals and to monitor environmental parameters during implementation. The extent of environmental and social work that might be required for the projects prior to implementation will depend on the outcome of the screening process. This process should include screening for possible resettlement impacts.

5.2 ESIA Procedure to be followed by the Project

108. The World Bank safeguard policy OP4.01 provides guidance on the environmental assessment procedures for WB funded projects. The Ghana EIA procedures have also established an acceptable process to screen and evaluate all developments, undertakings, projects and programs which have the potential to give rise to significant environmental impacts. The two processes are largely similar and the Ghanaian procedures are therefore given in the following sections and will mostly be statutorily followed by all sub-project activities to obtain environmental permits for the intended activities.

109. Sub-project activities will only commence when an environmental permit has been procured from the EPA. The Agency has provided the list of projects for which ESIA is mandatory. These have been given in the Annex and are consistent with the World Bank categorization of projects.

110. The following steps will be followed by MoFA, the implementing agency to ensure environmental and social compliance of the Project.

Step 1: Environmental Registration of the Project

111. MoFA will appoint an Environmental Officer to provide safeguards supervision over the Projects. The appointed/ designated Environmental Officer will be directly responsible for the registration of project interventions with the EPA as required by law. The Environmental Assessment Registration Forms are available at all EPA offices to register every project/ development that may have an impact on the environment.

112. A sample copy of the EA1 Form is provided in the Annex and the mitigation measures suggested in this ESMF as well as the checklist used in the screening exercise should assist to complete this Form. For projects for which EIA are mandatory, the Environmental Officer should register with Form EA1 otherwise Form EA2 should be used. This is a requirement under the Environmental Assessment Regulations LI 1652 (1999).

Step 2: Screening

113. This activity in accordance with the EAR 1999 LI1652 is the responsibility of the EPA. The Agency, within 25 days of receiving the Registration Form take a decision by placing the

project at the appropriate level of environmental assessment. The results will be communicated to the implementing agency with reasons, which could be any of the following:

- Objection to the project
- No objection to the project (equivalent to World Bank Category C Project)
- Preliminary Environmental Assessment (PEA) will be required (equivalent to World Bank Category B2 Project)
- Environmental and Social Impact Assessment (ESIA) required (equivalent to World Bank Category B1 or A Project).

114. For projects receiving the 'no objection' from the EPA (WB Category C project) and therefore have only minor environmental and social risks, the implementing agency may move to implementation in accordance with pre-approved standards or codes of practices or they pre-approved guidelines for environmental and social management.

Step 3: Conduct environmental and social assessment studies

115. The Environmental Officer will prepare the Terms of Reference for the ESIA, and follow procurement rules for the recruitment of consultants for the ESIA. The ToR may be prepared using issues identified during the screening exercise and also the registration of the project with the EPA. Also, the impact mitigation measures provided in this ESMF may provide some basis for the design of the ToR. To facilitate the formulation of the ToR, a template has been prepared and provided in the Annex of this report.

116. The ESIA will identify and evaluate potential environmental impacts for the proposed activities, evaluate alternatives, and design mitigation measures. It will also analyze any cumulative impacts, where applicable. The preparation of the ESIA will be done in consultation with stakeholders, including people who may be affected. Public consultations are critical in preparing a proposal for the activities of the projects likely to have impacts on the environment and population. The public consultations should identify key issues and determine how the concerns of all parties will be addressed in the ESIA. When an ESIA is necessary, the administrative process enacted by the EPA will be followed and executed.

Procedures for projects requiring an ESIA

First stage: Preparation of Terms of Reference The results of identification, and extent of the ESIA (scoping), the terms of reference will be prepared by the Environmental Officer.

Second stage: Selection of consultant

Third stage: Preparation of the ESIA with public consultation The report will follow the following format:

- Description of the study area
- Description of the subproject

- Discussion and evaluation of alternatives
- Environment description
- Legal and regulatory
- Identifying potential impacts of proposed sub-projects, including cumulative impacts
- Process of public consultations
- Development of mitigation measures and a monitoring plan, including estimates of costs and responsibility for implementation of surveillance and monitoring

Step 4: Review and approval of the ESIA for the sub-project; Publication / Dissemination of ESIA

117. The Environmental Officer will submit the draft ESIA to EPA. The report will be reviewed by a cross-sectoral National Environmental and Social Impact Assessment Technical Review Committee (ESIA/TRC) which is expected to:

- Assist the Agency in screening/reviewing all Environmental Assessment Applications and Reports (Environmental Impact Statements, Annual Environmental Reports, Environmental Management Plans and other related reports)
- Make recommendations to the Executive Director of the EPA for final decision-making
- Provide technical advice on conduct of assessments and related studies on undertakings and the reports submitted on them;
- Make recommendations on the adequacy of the assessment and any observed gap;
- Advice on the seriousness of such gaps and the risks or otherwise to decisions required to be made recommend whether the undertakings as proposed must be accepted and under what conditions, or not to be accepted and the reasons, as well provide guidance on how any outstanding issue/areas may be satisfactorily addressed.

118. Copies of the ESIA will be placed at vantage points including the EPA Library, relevant District Assembly, EPA Regional Offices and MoFA head office and regional offices. EPA serves a 21-day public notice in the national and local newspapers about the ESIA publication and its availability for public comments.

Step 5: Public Hearing and Environmental Permitting Decision (EPD)

119. Regulation 17 of the LI 1652 specifies three conditions that must trigger the holding of a public hearing on a project by the Agency. These are:

- Where notice issued under regulation 16 results in great public reaction to the commencement of the proposed undertaking;
- Where the undertaking will involve the dislocation, relocation or resettlement of communities; and
- Where the Agency considers that the undertaking could have extensive and far-reaching effects on the environment.

120. Where a public hearing is held, the processing of an application may extend beyond the prescribed timelines required for EPA's actions and decision-making.

Environmental Permitting Decision (EPD)

121. Where the draft ESIA is found acceptable, MoFA will be notified to finalize the reports and submit eight hard copies and an electronic copy. Following submission to EPA, the implementing agency shall be issued an Environmental Permit within 15 working days and issue gazette notices.

122. Where the undertaking is approved, MoFA shall pay processing and permitting fees prior to collection of the permit. The fees are determined based on the Environmental Assessment Fees Regulations, 2002, LI 1703.

Responsibilities for the Implementation of the Screening Process

123. The ESMF will be implemented by MoFA that would establish a team of Environmental and Social Officers who will collaborate with the EPA and the World Bank safeguards team to ensure effective execution. Table 20 provides a summary of the stages and institutional responsibilities for the screening, preparation, assessment, approval and implementation of the project activities.

Table 6. Environmental and Social Screening and Responsibilities

No	Stage	Institutional Responsibility	Implementation Responsibility
1	Screening of Environmental and Social Infrastructure micro Project to assist in project formulation using checklist	MoFA	Social and Environmental Officer

2	Determination of appropriate environmental and social assessment level/ category	EPA/ MoFA	Social and Environmental Officer
2.1	Selection validation	World Bank	Social and Environmental Officer
3	Implementation of environmental and social assessment	MoFA	Social and Environmental Officer
3.1	If ESIA is necessary		
3.1a	Preparation of terms of reference	MoFA	Social and Environmental Officer
3.1b	Selection of Consultant	MoFA/Procurement Officer	Social and Environmental Officer/ Procurement Officer/ Safeguards specialist
3.1c	Realization of the EIA, Public Consultation and participation. Integration of environmental and social management plan issues in the tendering and project implementation,	MoFA/ Procurement Office/ Consultancy firm/ Contractor	Social and Environmental Officers/ Procurement Officer
4	Review and Approval	EPA/ World Bank	
4.1	ESIA Approval (B1)	EPA/ World Bank	
4.2	Approval simple measures (B2&c)	MOFA	Social and Environmental Officer/ Project manager

5	Participatory Public Consultation and disclosure	MoFA/EPA/ World Bank	EO/Contractor/Consultant
6	Surveillance and participatory monitoring	Implementing agency/EPA/ World Bank/ MoFEP	Social and Environmental Officers/ WB Safeguards specialists
7	Development of participatory monitoring indicators	MOFA	Environmental Officer /Safeguards Consultant

Other relevant World Bank provisions

124. The national provisions for the management of resettlement related issues are not as fully developed and therefore do not comply fully with the World Bank safeguard policy requirements. Thus, it is expected that a separate document to guide the process, i.e. a Resettlement Policy Framework (RPF) document will be prepared as a standalone report to support the social management and acceptability of the projects.

125. The World Bank OP 4.09 has also been triggered and a Pest Management Plan (PMP) will also be available to guide the project as a standalone.

Technical Specifications and Standards

5.2.1 Technical specifications

126. MoFA with technical support from its department and agencies, will be responsible for the development and presentation of clear guidelines for the design and provision of technical specifications and standards to assist the private sector to plan for projects. These will ensure the streamlining of approaches and activities for sound implementation of projects. These will include adequate reference to sector norms and prescribed national codes of practice. The private sector will be well aware of applicable technical provisions and fit their projects into these accordingly.

5.2.3 Environmental standards

127. The EPA is responsible for setting environmental standards and has in place both general and sector specific guideline values. These standards and in some cases guidelines are required for the management of pollutant emissions. In situations where standards which therefore have legal backing are available then these must be followed. Otherwise, national guidelines or the World Bank guidelines could be used. In most cases, these are practically similar.

5.3 Environmental and Social Monitoring and Reporting

128. Monitoring is a key component of the ESMF during project implementation. Monitoring should be undertaken at the sub-projects implementation phase to verify the effectiveness of impact management, including the extent to which mitigation measures are successfully implemented. Monitoring should involve three areas namely:

- Compliance monitoring;
- Impact monitoring; and
- Cumulative impact monitoring.

129. The aim of monitoring would be to:

- Improve environmental and social management practices;
- Check the efficiency and quality of the EA processes;
- Establish the scientific reliability and credibility of the EA for the project; and
- Provide the opportunity to report the results on safeguards and impacts and proposed mitigation measures implementation.

5.3.1 Compliance Monitoring

130. This is to verify that the required mitigation measures, which are the environmental and social commitments agreed on by the MOFA and EPA (main environmental regulator) are implemented. Compliance monitoring would include inspections during construction of the project's components such as the various parts of the plant and pipelines as well as the right of way to verify the extent to which conditions based on which licenses are issued are adhered to. The operational/ decommissioning phase of the sub-projects will also be monitored. Compliance monitoring will be done by the EPA.

5.3.2 Impacts Monitoring

131. Monitoring of sub-projects impacts mitigation measures should be the duty of the Environment Department (which is yet to be created) of the MOFA. The Environmental and Social (E&S) safeguards given to the contractor in the contract specifications (in the Annex) should be monitored to ensure that works are proceeding in accordance with the laid down mitigation measures. The MOFA should ensure that the contractor submits report on work progress and any challenges in observing the E&S safeguards. The monitoring results should form a major part of the reports to be submitted to the EPA and MOFA

5.3.3 Cumulative Impacts Monitoring

132. The impacts of the Project on the environmental and social resources within the Project's area of influence should be monitored with consideration to other developments which might be established. There should be collaboration between MOFA and other proponents to compare E&S safeguards guiding the individual projects implementation to ensure comprehensive management of cumulative impacts.

Impact issues	**Proposed Action/Measures**	**Implementation tool/criteria**	**monitoring indicators**	**Verification**	**Project stage**	**Responsibility**
Solid waste disposal	-Provide adequate waste reception facilities at construction/work camp sites - -Dispose of waste at District Assembly approved waste dump sites	- EHSP/Waste Management Plan/Construction site management plan	Number of site waste bins Final disposal records	Weekly checks by project engineers	Construction Operation	Contractors Project engineer
Waste oil/fuel disposal	-Provide drums or containers for temporarily storage of spent or waste oil from vehicles and equipment -Dispose of waste oil through recognized oil marketing company or approved agent	EHSP/Spill prevention and control plan	Waste oil drums or containers on site Waste oil collection and disposal records	Monthly checks by project engineers	Construction Operation	Contractors Project engineer

Air/noise pollution	-Purchase sound equipment/ machinery for project -Operate well maintained engines, vehicles, trucks and equipment. -Use good quality fuel and lubricants -Suppress dust generation at project sites -Reduce traffic speed on unpaved roads through communities and at project sites -Switch off engines of vehicles/trucks and earth- moving equipment when not in use.	Part of contract agreement with contractor -A routine maintenance program or plan for equipment/ machinery - Purchase fuel recognized fuel/ filling stations Speed limits on unpaved roads through communities should be ≤50km/hr and near or at project site should be ≤30 km/hr	Maintenance plan implementation - Grievances recorded Records of Actions taken to address grievances	-Independent checks by project engineers -Maintenance records verified by project engineers -Grievance records checked by contractor -Self check by contractor	Construction	Contractors / Project engineers

Impacts on Landscape and Visual Receptors	Project sites should be boarded off from public view and ensure good house-keeping at construction sites	Construction site management plan	Implementation of Plan	Self-check by contractor	Construction	Contractors / Project engineers
Impact on traffic	Use only road worthy vehicles and trucks -Use experienced drivers	Purchase sound vehicles and trucks /machinery for project Driver qualification	Traffic incidence records -Grievances recorded	Project engineers to verify Self-check by contractor	Construction	Contractors / Project engineers

Water pollution	- No garbage/refuse, oily wastes, fuels/waste oils should be discharged into drains or water bodies -Fuel storage tanks/sites should be properly secured -Maintenance and cleaning of vehicles, trucks and equipment should take place offsite. -Provide toilet facilities for construction workers	EHSP/ waste management plan Spill prevention and control plan/EHSP Construction site management plan EHSP	-Visibility of oil on water bodies -On site erosion features -Proposed actions implemented	-Daily self-checks by contractors -Periodic reports on performance by contractor to project engineers -Spot checks/audits by project engineers	Construction Operation	Contractors / Project engineers Project engineers

Impact on fauna and habitat	-avoid unnecessary exposure or access to sensitive habitat. -Regular inspection or monitoring should be carried out in sensitive areas eg swamps/ wetlands the area prior to start of work.	If a sensitive habitat is discovered in the work area or vicinity, Project activities should cease. The contractor should notify project engineers who will consult Wildlife Division to determine the appropriate course of action.	Presence of sensitive habitat at project area/beach	-Regular self-checks by contractor -	Construction	Contractors / Project engineers/Wildlife Division/ EPA

Impacts on inland water bodies and Fauna/ habitat	Ensure proper storage and handling of fuels, oil, wastes, and other potentially hazardous materials. -Regular monitoring of suspected or known sensitive areas should form part of the project activities. -Project activities should avoid disturbance of habitat or sensitive areas in working area. -Project must report sightings of any injured or dead aquatic life (fishes).	Hazardous material management plan/ oil spill prevention and control plan -Regular fauna observation report - awareness raising contractor personnel	Water accidents/incidents recorded Water pollution identification and monitoring indicators recorded	- Daily self-checks by contractor - Periodic reports on performance by contractor to client -Spot checks and audit by project engineers - Grievances recorded	Pre-construction, construction and maintenance	Contractors / Project engineers

Impact on inland water marine quality processes bodies/ water /coastal	-Ensure proper storage and handling of fuels, oil, wastes, and other potentially hazardous materials. -Marine vessels to adhere to IMO regulations on bilge and ballast water discharge/waste oil disposal. -Areas close to water bodies that are disturbed during construction activities should be rehabilitated as soon as possible.	- Hazardous material management plan/ oil spill prevention and control plan -Wastewater management plan/waste oil disposal plan Erosion control and restoration plan	Reduced Erosion in project area recorded No visible oil contaminant on water bodies recorded	-Daily self-checks by contractor - Periodic reports on performance by contractor to client -Spot checks and audits by project engineers -Periodic review of grievances recorded - Rehabilitated areas to be Observed regular basis.	Pre-construction, construction and maintenance	Contractors / Project engineers
Social Impact Assessment						
Impact issues	Proposed Action/Measures	Implementation tool/criteria	monitoring indicators	Verification	Project stage	Responsibility

Physical displacement of PAP	For acquired sites, the affected persons to be given relocation assistance (cash or kind) For acquired sites, to relocate communities and propertie	RPF Resettlement Plan (RAP or ARP)	PAPs appropriately compensated and resettled removed and absent from site	Records to confirm PAPs received or provided with relocation assistance Resettlement plan implemented	Pre-construction	Project engineers
Employment and loss of livelihood	PAPs provided with livelihood assistance or assisted to get new jobs immediately without any loss of income. General Use local labour as much as possible and where readily available.	RPF Contractor labour policy	Caretaker complaints recorded Complaints from local communities recorded	PAPs employed elsewhere or evidence of livelihood assistance given. Project engineers to verify quota to locals prior to recruitment of construction workers	Pre-construction Construction	Project engineers Contractors / Project engineers

Deprivation of use of land	Compensation or replacement land	RPF/ Resettlement Action Plan	Resettlement Action Plan implementation	Evidence of acceptable compensation paid Resettlement plan implemented	Pre-construction	GIDA/ Project engineers
Loss of structures/ properties	Compensation for loss of permanent structures and assist to relocate other properties.	RPF/ Resettlement Plan	RPF implementation Resettlement Action Plan implementation	Evidence of acceptable compensation paid Evidence of Resettlement Action plan implemented	Pre-construction	GIDA/ Project engineers
Impacts on recreation and public areas	Place notices and warning signs at working areas	EHSP	Grievance records	Warning signs/ notices in place	Construction	Contractors / Project engineers

Impacts on Human Health/ Safety and sanitation	Cover buckets of trucks carrying construction materials such as sand, quarry dust, etc -Use road worthy vehicles/trucks and experienced drivers/operators - Active construction areas to be marked with high-visibility tape -Backfill and or secure open trenches and excavated areas. -Provide adequate sanitary facilities -Provide PPEs for construction workers. -Educate construction workers on site rules/regulation and hygiene and disease (HIV) prevention.	EHSP Vehicle maintenance programme/plan in place Construction site management plan EHSP EHSP EHSP	-Health and safety incident register -Grievance records	Health and safety plan under implementation -Daily self-checks and verification by contractor - Spot checks by project engineers - Periodic reports by contractor to project engineers	Construction	Contractors

Impacts on cultural heritage/ archaeological interest /existing marine infrastructure and services	-Identify cultural heritage resources and existing ecologically sensitive areas.	Pre-construction surveys / Chance finds procedure	Cultural/ archaeological resources/ existing infrastructure encounter incidence register	-Chance finds procedure under implementation -Daily self-checks and verification by contractor Periodic reports by contractor to project engineers	Pre-construction and construction and repairs/ recovery	Contractors
Impacts on Human Health and Safety	-Use suitable Personal Protective Equipment (PPE). -Train all construction workers in safe methods of working.	EHSP	-Health and safety incident register -Grievance records	-EHSP under implementation Spot checks and observations by project engineers -Periodic reports on performance by contractor to project engineers	Pre-construction and construction, and repairs/ recovery	Contractors

Marginalisation of women	-Special credit schemes with focus on women -Provide women with labour and time saving machinery through the setting up of plant pools within reach such as districts and communities -More women extension services workers should be allocated -Women's time constraints need to be taken into consideration when designing programmes for them, be it training or otherwise.	ESMF	- No. of women benefiting from project facility - No. of women extension workers - No of women attending training	-periodic survey and assessment reports	Operation	MoFA, GIDA

6. INSTITUTIONAL CAPACITY FOR ESMF IMPLEMENTATION

6.1 Institutional roles and responsibility in the ESMF Implementation

133. The ESMF provides guidance for the environmental and social safeguards for the Project and its successful implementation, will depend largely on the key stakeholder institutions. This will ensure that the sub-projects are undertaken with due regard for the integrity of the resources to be affected by the project development activities. The roles of the major stakeholders are identified in an institutional role identification matrix in which the various components of the Project were matched with the institutions which have jurisdiction in the areas of licensing, permitting, assessment, monitoring, etc. The main institutions to implement the program and projects and to ensure sound management of the environmental and social aspects include:

- MoFA
- GIDA
- Government Regulatory Agencies
- Private sector

Ministry of Food and Agriculture (MoFA)

134. The Ministry of Food and Agriculture (MoFA) has established a unit with focus on environmental issues. This Land and Water Management Unit collaborates strongly with the EPA to mainstream environment into policy decisions. MoFA is the government ministry spearheading the Project's effort and therefore plays a coordinating role among all the main stakeholders to ensure project success. The environmental and social management capacity at the regional offices is however limited and this will need to be enhanced and utilized for the environmental success of the project.

Ghana Irrigation Development Authority (GIDA)

135. Additionally, sector agencies like GIDA have their environmental outfits. Again, this is not adequately equipped and will require some support to be capable of playing a full role in the environmental management and regulatory functions of the rehabilitated irrigation systems.

Environmental Protection Agency (EPA)

136. The EPA is responsible for ensuring compliance with laid down ESIA procedures in Ghana in accordance with the EPA Act 1994 (Act 490) and its amendment, and the Agency is expected to give environmental approval for Projects. The ESIA is being applied in Ghana to development projects as well as other undertakings as an environmental permitting pre- requisite and a major environmental management tool. The EPA is represented in all the ten (10) regions of the country and will support the project by exercising its permitting and monitoring powers. Though the Agency's technical capacity may be adequate there are issues with regard to logistics especially transport which therefore limits its monitoring and enforcement functions.

Project Screening, ESMF Review and Environmental Authorization/ License

137. This document provides the framework for an environmentally sustainable development and implementation of the Project. Following formal submission of this ESMF, the EPA would undertake a review of the document and confirm that the ESMF document is adequate for project approval vis-à-vis national ESIA provisions.

Water Resources Commission (WRC)

138. The WRC is responsible for granting licenses for any water use activity and the procedures as laid down in the WRC Act 1998 (Act 526) will be followed. All project activities requiring such license will receive assistance from the WRC and the Commission will therefore provide adequate guidance to ensure that the proper procedures are used.

Lands Commission

139. The Land Valuation Board (LVB) is the statutory body ensuring that land required for projects are properly acquired and also transparent procedures are followed and fair and adequate compensation is paid. Though private firms may be invited to participate in the process, in case of disputes, the LVB would assist to ensure prompt settlement.

6.2 Capacity Building Requirements

140. Competence of government i.e., the ability of active government parties to carry out their respective design, planning, approval, permitting, monitoring and implementation roles will, to a large extent, determine the success and sustainability or otherwise of the Project.

141. The objectives and provisions of this ESMF therefore cannot be achieved in the absence of relevant competencies on environmental and social management within MoFA and GIDA and other stakeholders. The following sections provide recommendations on capacity building to support the program's environmental and social management objectives.

Identification of Capacity Building Needs

142. The first step in pursuing capacity building will be to identify the capacity building needs of the various stakeholders. Capacity building should be viewed as more than training. It is human resource development and includes the process of equipping individuals with the understanding, skills and access to information, knowledge and training that enables them to perform effectively. It also involves organizational development, the elaboration of relevant management structures, processes and procedures, not only within organizations but also the management of relationships between the different organizations and sectors (public, private and community).

The capacity building requirements will mostly be in the form of training workshops and seminars. A training workshop on the ESMF/RPF and the World Bank safeguard policies of OP 4.12 and OP 4.01 would be organized for MoFA and GIDA (head office and regional offices) as well as the Private sector (Project consultants/contractors). The following additional training topics are proposed:

- Environmental and social Screening Checklist
- Completion of EA Registration Forms

- Preparation of Terms of Reference for ESIA
- Environmental and Social Clauses in Contractors' contract and bidding documents.

143. The Social and Environmental officers would have sufficient knowledge and understanding of the implementation of the World Bank policies of OP 4.12, OP 4.01 and OP 4.09 and participate in the training of regional officers.

6.3 Budgetary provisions

144. The awareness creation, capacity improvement and training workshops will be organised for selected officers involved in the implementation of the Project, mainly:

- MoFA head office and regional officers, and
- GIDA head office and regional officers

145. The relevant regions will comprise: Greater Accra, Volta, Northern, Upper West, Upper East and Brong Ahafo Regions.

146. The cost is estimated at US$43,000 (some safeguards interventions to be co-financed with WAAPP and GCAP as the activities overlap the 3 sister projects) as explained in the Table 8 below:

Table 7. Budget for Capacity Building and Awareness creation

S/N	Activity	Description	Unit Cost	No.	Total Cost US$
1	Awareness creation and Capacity building for MoFA, project staff	Training workshop on ESMF implementation and ESIA procedures	3,000	2	6,000
2	Capacity building for Extension officers/ MMDA	Regional training workshops on ESIA procedures	5,000	3	15,000
3	Awareness creation and information dissemination		2,000	1	2,000

	workshop				
4	Monitoring and evaluation	Hiring of consultants and preparation of reports	20,000		20,000

7. PUBLIC CONSULTATIONS AND PARTICIPATION AND INFORMATION DISCLOSURE

7.1 Stakeholder consultations and Participation

147. The ESMF preparation included extensive stakeholder and participation consultations. Key project stakeholders were identified for consultations and these included Government Ministries, State Agencies/ Organizations'/ and Departments, Project offices, Non- governmental organization and local communities, both the affected and host communities, including women, the poor and most vulnerable groups.

148. Meetings were held with key officials and opinion leaders to gauge level of awareness and involvement with the project, concerns of project implementation, and to obtain relevant documents or baseline information. The consultations and participation also served to gather information on the mandates and permitting requirements to inform the development of the Program.

149. The list of stakeholders contacted and issues discussed are presented in the Stakeholder Meetings and Public Consultation and Participation report (Annex 1).

7.2 ESMF Disclosure

150. The World Bank policies require that environmental reports for projects are made available to project affected groups, local NGOs, and the public at large. Public disclosure of ESIA documents or environmental reports is also a requirement of the Ghana ESIA procedures. However, there is no limitation as to the extent and scope of disclosure. MoFA in collaboration with the line agencies and EPA will make available copies of the ESMF in selected public places as required by law for information and comments. Public notice in the media should be served for that purpose. The notification should be done through a newspaper or radio announcement or both. The notification should provide:

(a) a brief description of the Project;

(b) a list of venues where the ESMF report is on display and available for viewing;

(c) duration of the display period; and

(d) contact information for comments.

151. The EPA will assist to select display venues upon consultation with MoFA. These would be project sites specific and very much informative to beneficiaries

8. GRIEVANCE REDRESS MECHANISM

152. Grievance mechanisms provide a formal avenue for affected groups or stakeholders to engage with the project implementers or owners on issues of concern or unaddressed impacts. Grievances are any complaints or suggestions about the way a project is being implemented. They may take the form of specific complaints for damages/injury, concerns about routine project activities, or perceived incidents or impacts. Identifying and responding to grievances supports the development of positive relationships between projects and affected groups/communities, and other stakeholders.

153. The World Bank/IFC standards outline requirements for grievance mechanisms for some projects. Grievance mechanisms should receive and facilitate resolution of the affected institutional or communities' concerns and grievances. The World Bank/IFC states the concerns should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities, at no cost and without retribution. Mechanisms should be appropriate to the scale of impacts and risks presented by a project.

154. Grievances can be an indication of growing stakeholder concerns (real and perceived) and can escalate if not identified and resolved. The management of grievances is therefore a vital component of stakeholder management and an important aspect of risk management for a project.

155. Projects may have a range of potential adverse impacts to people and the environment in general, identifying grievances and ensuring timely resolution is therefore very necessary. As such the ESMF has developed a grievance management process to serve as a guide during project implementation. This Grievance Redress Mechanism (GRM) builds pretty much on the one provided in the Resettlement Policy Framework (RPF) where much more details could be found.

156. The grievance management guide to be followed by MoFA is provided in Table 7.

Table 8. Grievance Management Guide

Step	Process	Description	Time Frame	Other information
1	Identification of grievance	Face to face; phone; letter, e-mail; recorded during public/community interaction; others	1 Day	Email address; hotline number

2	Grievance assessed and logged	Significance assessed and grievance recorded or logged (i.e. in a log book)	4-7 Days	Significance criteria Level 1 –one off event; Level 2 – complaint is widespread or repeated; Level 3- any complaint (one off or repeated) that indicates breach of law or policy or this ESMF/RPF provisions
3	Grievance is acknowledged	Acknowledgement of grievance through appropriate medium	7-14 Days	
4	Development of response	-Grievance assigned to appropriate party for resolution - Response development with input from management/ relevant stakeholders	4-7 Days 10-14 Days	
5	Response signed off	Redress action approved at	4-7 Days	MoFA should

		appropriate levels		sign off
6	Implementation and communication of response	Redress action implemented and update of progress on resolution communicated to complainant	10-14 Days	
7	Complaints Response	Redress action recorded in grievance log book Confirm with complainant that grievance can be closed or determine what follow up is necessary	4-7 Days	
8	Close grievance	Record final sign off of grievance If grievance cannot be closed, return to step 2 or refer to sector minister or recommend third- party arbitration or resort to court of law	4-7 Days	MoFA

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Annex 1: Initial Community consultation and persons met

Purpose of mission: Conduct Community Consultations towards the formulation of the Ghana Peri-Urban Project

Context and Objective:

FAO is providing technical support to the Ministry of Food and Agriculture (MOFA) to formulate a Peri-Urban Commercial Vegetable Value Chains Project documents to solicit funding from the Japan Social Development Fund. The objective of the mission was therefore to hold, as part of the wider stakeholder consultations (on the project and associated potential social and environmental impacts), community rapid appraisal in order to confer with the potential beneficiaries, understand their issues, constraints and challenges and participatorily map out possible activities and environmental mitigation plans to be included in the overall project design.

Members of the Project Formulation team who also participated in the mission were Mark Offei (Programme Assistant, FAO Ghana), Abigail Kanyi (Agribusiness Specialist) and Mr. Torgbor Humphrey (Irrigation Advisor).

Activities and Results:

The Mission team first visited B-BOVID Ltd at Anoe, Takoradi where discussions were held with the Management and staff to understand the linkages between their operations and the proposed project. Sites earmarked for eventual project activities including the sitting of the Machinery for the Vegetable Warehousing Centre were also visited.

The team then moved to Ada and to Sega Akpokope I & II Communities where the team together with MOFA staff from the Greater Accra Regional Office, Accra and the Dangme East District Office, Ada held discussion with the farmers and visited potential irrigation sites.

Key constraints that were identified during the participatory appraisal session included:

a. Erratic rainfall pattern and its impact on their farming operations: The farmers pinpointed that, the rainfall pattern has become unpredictable and highly erratic and this according to them is having negative impact on their operations since they depend entirely on the rains to conduct their farming operations with no irrigation infrastructure.

b. High Post-Harvest Losses: The farmers identified high post-harvest losses especially in times of glut as one of the challenges that is affecting their ability to make a living from their farming activities. According to them, during times of glut, they are able only to sell just small portion of their produce and the rest goes waste.

c. Lack of access to markets: The farmers identify the phenomenon where buyers dictate prices to them as a key issue which make is impossible for them to earn reasonable

income from their operations.

The farmers were of the view that, the project will be of benefit to them and expressed their readiness to participate in project activities.

Key Environmental concerned discussed:
The key concerns raised by the local stakeholders are related to land degradation issues that affect their livelihood, mainly the reduction of arable lands due to water erosion and silting of lowlands, limited access to financial markets, and need for technical capacity building and strengthening to improve vegetable farming practices.

These have been incorporated in the project design (protection of watersheds from erosion and secure irrigation potential, Farmers Field School program, matching grant facility, etc.). Since stakeholder consultation and participation is an iterative process, it will be pursued and sustained throughout the project lifespan.

It was also agreed that site specific Environmental and Social Impact studies will be conducted and impact mitigation actions plans developed and approved through community consultations before implementation starts.

Follow-up Actions:

a) Synthesis of the information gathered in the field to design the project and prepare the funding proposal for the Ministry of Food and Agriculture.
b) Prepare Environmental and Social Management Framework to outline the potential social and environmental effects of the proposed project.

List of Participants:

Name	Position	Community
Togbeza K. N. Ahadjor IV	Chief	New Bapka
Doe Gbormedoazio	Elder	New Bapka
Peter Kwasi Hadjor	Elder	New Bapka
Gbaligbenyo Daniel	Headman	Hamidukope
Awuku Humadi	Queen Mother	Hamidukope
Adadzi Humadi	Stool father	Hamidukope
Issa Ouedraogo	Nucleus Farmer	Anoe and Ahanta
Lowor J. Tetteh	Community Head	Aklusu Saisi
Sumauel K Teye	Organizer	Aklusu Saisi
Foster E Oku	Coordinator	Aklusu Saisi
Amuzu Ahli	Chief	Tordzinu
Lord Ayitey	Elder	Tordzinu
Adukpon Gbeve	Elder	Tordzinu
Togbe Yela Keteni V	Head Chief of Tsiala Clan	Nutekpor
Patrick K G. Amenya	Elder/Opinion Leader	Nutekpor
Richard Amenyavie	Elder	Nutekpor

Torgbe Exi III	Chief	Hikpo
Thomas Soku	Elder	Hikpo
John Bedzra	Elder	Hikpo

Annex 2: Screening Checklist for Environmental and Social Issues

1. Project Information: Name and Contact Details:			
Project Details	Location: (Region/District/Community)		
	If other, explain:		
Project Focal Person			
Name of Interviewer:		Date of Screening:	

Sb-project Details: Attach location map (longitude-Latitude coordinates (GPS reading) if available)	
Type of activity: What will be done, who will do it, what are the objectives and outcomes.	
Estimated cost:	
Proposed Date of Commencement of work. Expected Completion of Work	
Technical drawing specifications review:	Yes/No – refer to Application Portfolio

2. **Physical Data:**	Comments
Subproject area site area in ha:	
Extension of or changes to existing land use	
Any existing property to transfer to subproject	
Any plans for construction, movement of earth, changes in land cover	

3. Preliminary Environmental Information:	Yes/No	**Refer to Process Framework**	**Comments**
Is there adjacent/nearby critical natural habitat?			
Is there activities On Forest Reserve?			
Is there activity adjacent to Forest Reserve?			
What is the land currently being used for? (e.g. agriculture, gardening, etc.)			List the key resources.
Will the proposed activities have any impact on any ecosystem services, biodiversity issues or natural habitats?			
Will there be restrictions or loss of access to using natural resources in any traditional areas including medicinal plants or those of economic value for livelihoods?		x	
Will there be water resource impacts?			
Will there be soil impacts?			
Will the subproject require use of pesticides?			If Yes, refer to Pest Management Plan
Are there any new or changing forest management planning or activities?		x	
Any cultural heritage/sacred sites in project area?		x	

4. Preliminary Social and Land Information:	Yes/No	**Refer to Process Framework**	**Comments**
Has there been litigation or complaints of any environmental nature directed against the proponent or subproject?		x	

Will the subproject require the acquisition of land?		X	
What is the status of the land holding (customary, lease, community lands, etc.)?		X	
Is there evidence of land tenure status of farmers and/or occupants (affidavit, other documentation)?		X	
Are there outstanding land disputes?		X	
Has there been proper consultation with stakeholders?		X	
Is there a grievance process identified for PAPs and is this easily accessible to these groups/individuals?		X	
Will there be any changes to livelihoods?		X	
What are the main issues associated with farmer benefits and community benefits?		X	
Will any restoration or compensation be required with "admitted" farmers?		X	

5. Impact identification and classification:
When considering the location of a subproject, rate the sensitivity of the proposed site in the following table according to the given criteria. Higher ratings do not necessarily mean that a site is unsuitable. They indicate a real risk of causing undesirable adverse environmental and social effects, and that more substantial environmental and/or social planning may be required to adequately avoid, mitigate or manage potential effects. The following table should be used as a reference.

Issues	**Site Sensitivity**			**Rating (L,M,H)**
	Low	**Low**	**High**	
Natural habitats	No natural habitats present of any kind	No critical natural habitats; other natural habitats occur	Critical natural habitats present; within declared protected areas	**If High Refer to Annex 3.1 and Contact Regional EPA**
Water quality and water resource availability and use	Water flows exceed any existing demand; low intensity of water use; potential water use conflicts expected to be low; no potential water quality issues	Medium intensity of water use; multiple water users; water quality issues are important	Intensive water use; multiple water users; potential for conflicts is high; water quality issues are important	
Natural hazards vulnerability, floods, soil stability/ erosion	Flat terrain; no potential stability/ erosion problems; no known flood risks	Flat terrain; no potential stability/ erosion problems; no known flood risks	Flat terrain; no potential stability/ erosion problems; no known flood risks	
Land and Farming Tenure	No conflicts, disagreements around use of land, tenant farmer rights and location of admitted farms and farmers transparent	Process of land regularization and rights to natural resources being worked out with clear communication and grievance process in place	Land conflicts historically unresolved, admitted farmers being evicted, tenant farmers loosing rights and no transparency or grievance redress available	**If Medium or High Refer to Process Framework**

6. E & S assessment comments based on site visit:
Summary Observations

Determination of environmental category based on findings of the screening: A ____B ____C ____
□ Requires an EIA
□ Requires preparation of additional E&S information
□ Does not require further environmental or social due diligence

Potential Environmental and Social Issues That Require Referral to EPA or Using EA1 Form

	Benchmark and Issues	**Impact description**	Yes	No	**Remark**
1	Statutory provisions	Is the proposed irrigation area less than 40ha?			If yes, proceed with EA1 Form
2	Statutory provisions (*see Natural Habitat Issues in Checklist*)	Are there any ecologically sensitive/ critical areas within the proposed project area (**refer to Annex 3.1)**			If yes, contact regional EPA
3	Protected areas and wildlife	Will project activities potentially impact natural habitats or critical wildlife species			If yes, proceed with EA1 form
4	Biodiversity loss	Will land use change or vegetation clearance lead to loss of exceptional flora/ fauna			If yes, proceed with EA1 form
5	Water pollution	1. Is there a local stream close to the project site? 2. Does it flow all year round? 3. How long does it take to walk to this stream 4. Do you think any project activity will affect this stream			If 4 is yes, proceed with EA1 form
6	Soil erosion	Are there steep slopes in the project area? Can you easily walk on the slopes without falling			If yes, proceed with EA1 form

Annex 3.1: Environmental Sensitivity/Critical Areas

NB: *Projects sited in these areas could have significant effects on the environment and the EPA could require a more stringent environmental assessment*
All areas declared by law as national parks, watershed reserves, forest reserves, wildlife reserves and sanctuaries including sacred groves
Areas with potential tourist value
Areas which constitute the habitat of any endangered or threatened species of indigenous wildlife (flora and fauna)
Areas of unique historic, religious, cultural, archaeological, scientific or educational interest
Areas which provide space, food, and materials for people practicing a traditional style of life
Areas prone to disaster (geological hazards, floods, rainstorms, earthquakes, landslides, volcanic activity etc.)
Areas prone to bushfires
Areas classified as prime agricultural areas
Recharge areas of aquifers
Water bodies characterized by one or any combination of the following conditions: Tapped for domestic purposes Within controlled/ protected areas Which support wildlife and fishery activities
Mangrove areas characterized by one or any combination of the following conditions:
With primary pristine and dense growth
Adjoining mouth of major river system
Near or adjacent to traditional fishing grounds
Which acts as natural buffers against shore erosion, strong winds and storm floods
Estuaries and lagoons
Other coastal areas of ecological, fisheries or tourism importance or which are subject to dynamic change
Wetlands
Rivers

Areas of high population density