REPUBLIC OF GHANA

MINISTRY OF FOOD AND AGRICULTURE

WEST AFRICA AGRICULTURAL TRANSFORMATION PROGRAM (WAATP)

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

FINAL REPORT

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Ministry of Food & Agriculture

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LIST OF ABBREVIATIONS/ACRONYMS

ACMV	African Cassava Mosaic Virus
AFSTA	African Seed Trade Association
AKIS	Agricultural Knowledge Information System
ADR	Alternative Dispute Resolution
CAADP	Comprehensive Africa Agricultural Development Program
CAAS	China Academy of Agricultural Science
CARGS	Competitive Agricultural Research Grants Scheme
CCMC	Chemical Control and Management Centre
CER	Contingent Emergency Response
CD	Compact Disc
CGIAR	Consultative Group on International Agricultural Research
CILSS	Permanent Interstate Committee for Drought Control in the Sahel *(English Version)*
CSIR	Council for Scientific and Industrial Research
ECOWAS	Economic Community of West African States
EACMV	East African Cassava Mosaic Virus
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impact Assessment
ECCNRM	Environment Climate Change and Natural Resource Management
ESMF	Environmental and Social Management Framework
FASDEP	Food and Agricultural Sector Development Policy
FBOs	Farmer Based Organizations
GAMA	Greater Accra Metropolitan Area
GCAP	Ghana Commercial Agriculture Programme
GIDA	Ghana Irrigation Development Authority
GIPC	Ghana Investment Promotion Council
GoG	Government of Ghana
GSID	Ghana Seed Inspectorate Division
HRD	Human Resource Development
I-2	Strain of the Newcastle disease virus designated I-2
ICD	International Competitive Bidding
IDA	International Development Assistance

IFC	International Finance Corporation
IFPRI	International Food Policy Research Institute
ICB	International Competitive Bidding
ICT	Information Communication Technology
IWCM	Integrated Weed and Crop Management
ISM	Implementation Support Mission
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IITA	International Institute of Tropical Agriculture
ISPs	Internet Service Providers
KMA	Kumasi Metropolitan Assembly
KNUST	Kwame Nkrumah University of Science and Technology
LAP	Land Administration Project
LCS	Least Cost Selection
LHGD	Low/Medium Head Gravity Drip
MAP	Months after Planting
MDGs	Millennium Development Goals
M & E	Monitoring and Evaluation
MOFA	Ministry of Food and Agriculture
MOU	Memorandum of Understanding
NARS	National Agricultural Research System
NCB	National Competitive
NCOS	National Centre of Specialization
ND	Newcastle disease
NDI-2	Newcastle disease virus designated I-2
NGO	Non-Governmental Organisation
NLSP	National Livestock Services Project
NEPAD	New Partnership for Africa's Development
NLSP	National Livestock Services Project
NPC	National Program Coordinator
NPSC	National Project Steering Committee
OFSP	Orange Fleshed Sweetpotato
OPV	Open Pollinated Variety
PAH	Poly-Aromatic Hydrocarbons
PBB	Plant Breeders Bill
PBDU	The Participatory Business Development Unit

PCR	Polymerase Chain Reaction
PD	Projects Division
PPD	Postharvest physiological deterioration
PPMED	Policy Planning Monitoring and Evaluation Directorate
PPRSD	Plant Protection and Regulatory Services Directorate
PPP	Public Private Partnership
PIM	Project Implementation Manual
PFRD	Pesticides and Fertilizer Regulatory Division
QCBS	Quality Cost Based Selection
QC	Quality Control
QCBS	*Quality and Cost-Based Selection method*
RADs	Regional Agricultural Departments
RAP	Resettlement Action Plan
RCC	Regional Coordinating Council
R & D	Research and Development
RELCs	Research Extension Linkages Committees
RCoE	Regional Centre of Excellence
ROPPA	Network of Farmers' and Agricultural Producers' *(English version)*
RSC	Regional Steering Committee
SADA	Savannah Accelerated Development Authority
SAKSS	Strategic Analysis and Knowledge Support Systems
SCG	Semi- California Gravity System
STI	Spray Tube Irrigation
ToR	Terms of Reference
UDS	University for Development Studies
USAID	United States Agency for International Development
UG	University of Ghana
VACNADA	Vaccine for the Control of Neglected Animal Diseases
VCU	Value for Cultivation and Use
VSD	Veterinary Services Directorate
WAAPP	West Africa Agricultural Productivity Program
WASP	West Africa Agricultural Seed Program
WAATP	West Africa Agricultural Transformation Program
WB	World Bank
WECARD/CORAF	West and Central African Council for Agricultural Development

WIAD	Women in Agricultural Development
WRC	Water Resources Commission

EXECUTIVE SUMMARY

Brief Project Description

The Government of Ghana, in collaboration with the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and the World Bank, is undertaking the West Africa Agricultural Transformation Program (WAATP) under the World Bank funding to take forward the unfinished business of the West African Agricultural Productivity Program (WAAPP).

The West African Agricultural Productivity Program (WAAPP), which occurred from 2007 to 2017 has been assessed as successful and tagged as a flagship of the World Bank (WB) and the (Economic Community of West African States) ECOWAS Regional Integration Program. The development objective of WAAPP was to contribute to agricultural productivity increase in the participating countries' top commodity sub- sectors that are aligned with regional priorities.

The overall objective of WAATP is to strengthen regional agricultural innovations system to facilitate mass adoption of climate smart technologies by producers, enhance job creation for the youth and value chain actors' access to regional markets for targeted agricultural products.

The West Africa Agricultural Transformation Program (WAATP) which is a five year program beginning 2018, will be implemented by the Ministry of Food and Agriculture (MOFA) through the WAAPP Project Coordinating Unit (PCU). The program has a nation-wide coverage, with the following five key components:

- Strengthening the new model of innovation delivery in West Africa:- The component aims to strengthening the National Centres of Excellence supported under WAAPP and upgrade them to become ECOWAS Regional Centres of Excellence (RCE) for research focusing on priority lines of research to be addressed regionally.
- Accelerating mass adoption of technologies and enhancing job creation in the agricultural sector:- The component aims at scaling up adoption of innovations that will accelerate productivity increases, improve climate resilience, reduce post-harvest losses, promote value addition, and accelerate job creation for the teeming youth

Policies, markets and institutional strengthening: - The component aims at creating an enabling policy environment to accelerate agricultural transformation, connect production to market and strengthen regional integration. Component 3 has three sub-components as follows.

- Contingent emergency response:- This component will address contingent emergencies in participating countries, seeks to redirect some of the project resources to contribute to other projects in the Chad portfolio to respond to an eligible emergency or crisis should the need arise.
- Project management, learning, monitoring and evaluation:- This component will ensure the project is efficiently managed and performance as well as impacts carefully tracked. This will build on the successful institutional arrangements mechanisms of WAAPP.

The WAATP will involve the following:

- Renovation of two existing agricultural stations at Mampong and Asuansi in the Ashanti and Central Regions respectively;

- Renovation of two existing veterinary quarantine stations at Bawku and Ho in the Upper East and Volta Regions respectively;
- Rehabilitation of two seed centres at Bolgatanga and Wa in the Upper East and Upper West Regions respectively; and
- Rehabilitation of some government and privately owned warehouses in the country

WAATP will also establish community demonstration plots on proven Climate Smart Agriculture (CSA) technologies for vegetables, cereals, legumes and root and tubers crops to farmers; and establish farmers field schools of CSA practices on identified commodities. WAATP may construct new seed conditioning (including processing and branding) centres.

Service Centres will also be developed to be point of provision of technologies for mass adoption. The projects will establish incubation centres for private sector participation in fish, fisheries and aquaculture systems and vegetable production. The incubation centres to be established by the project will be mainly private sector led. Some will also be facilitated under PPP arrangement. The Project will also seek to promote the use of greenhouse technology for the production of vegetables as business to the youth.

Purpose of ESMF

The Environmental and Social Management Framework (ESMF) seeks to establish a process of environmental and social screening which will permit the Ministry of Food and Agriculture (MOFA) and its implementing agencies to identify, assess and mitigate the environmental and social impacts of the proposed interventions under WAATP. The ESMF also determines the institutional coordination measures to be taken during the program implementation, including those relating to capacity building.

Specific subprojects have not been clearly identified at this stage, hence an ESMF provides a general impact identification framework to assist project implementers to screen the subprojects and institute measures to address adverse environmental and social impacts.

Overview of the Project Area of Influence

The WAATP is a five year program beginning 2018, and it will have a nation-wide coverage. The rehabilitation of the agricultural research stations, veterinary stations and seed centres will occur in the Ashanti, Central, Upper East, Upper West and Volta Regions. The other projects will be scattered across the country.

Ghana is situated on the West Coast of Africa between latitude 4° 30’ and 11° N and longitude 1° 10’ E and 3° 15’ W with a land size of 238,539km^2. It has a total border of 2,093km, including 548km with Burkina Faso to the north, 688km with Côte d’Ivoire to the west, and 877km with Togo to the east. It has a coastline on the Gulf of Guinea, part of the Atlantic Ocean, measuring 539km. The country is divided into 10 administrative regions (namely Ashanti, Brong Ahafo, Central, Eastern, Greater Accra, Northern, Volta, Western, Upper East and Upper West) and 216 districts.

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.

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. There are two broad ecological zones - a high forest zone (HFZ) covering much of the southern third of the country, and a savannah zone covering two thirds of the considerably drier northern Ghana.

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%. Global water resources are estimated at 53.2 km^3 per year, consisting of 30.3 km^3/year of internally produced water resource, and 22.9 km^3/year of runoff from other countries.

Land ownership and tenure in Ghana is governed by a system of common law and customary land law, from which have emerged the following categories of landholdings: Customary owned; State owned; and Customary owned but State managed land (also known as vested land).

Ghana's population exceeded 24 million in 2010, an increase of 28% from 2000. The average annual growth rate is about 2.4% and population is projected to reach 31 million by 2025. According to the report from the 2010 population and housing census, the proportions of the population aged 15 years and older who were employed in 2010 were nearly 42.0 percent. According to the 2010 PHC projections, more than 2.2 million Ghanaians cannot afford to feed themselves with 2,900 calories per adult equivalent of food per day, even if they were to spend all their expenditures on food.

According to a policy brief on women and smallholder agriculture in Ghana prepared by SEND Ghana in 2014 (Policy Brief No. 4/October2014), Women are the key actors in Ghana's agriculture, constituting over half the agricultural labour force and producing 70 per cent of the country's food stock. Women constitute 95 per cent of those involved in agro- processing and 85 per cent of those in food distribution.

Policy, Legal and Institutional Framework

The major national policy documents comprise the Medium Term National Development Policy Framework (Ghana Shared Growth and Development Agenda- GSGDA), 2010 to 2013, Food and Agriculture Sector Development Policy (FASDEP II), 2007, Ghana Seed Policy, national environmental and climate change policies, riparian buffer zone policy among others.

The regulatory framework is underpinned by the 1992 Constitution of Ghana, the Environmental Protection Agency (EPA) Act 1994 (Act 490) and Environmental Assessment Regulations 1999 (LI1652)

which establish procedures for an ESIA process in Ghana. The Ministry of Food and Agriculture (MOFA) is spearheading the institutional effort.

The World Bank (WB) is guided by policies/ procedures to ensure safe development of projects it is funding. The relevant WB safeguard policies applied to projects include OP 4.01 on Environmental Assessment, OP 4.12 on Involuntary Resettlement, OP 4.09 on Pest management. The World Bank safeguards policies will be binding when implementing World Bank funded projects. Where discrepancies exist between the national regulations and the Bank policies, the latter prevails.

Generic Risks and Potential Environmental/Social Impacts and Mitigation Guidelines

Mitigation guidelines have been prepared to respond to potential environmental/social risks and impacts arising from project implementation. The mitigation guidelines have been designed following the mitigation hierarchy of avoidance, reduction, compensation or offsetting the negative environmental and social impacts and risks. These generic measures are presented in the table below.

Potential impact and Risk issues	Impact and Risk Significance	Description of general mitigation actions
Bio-physical Environment		
Waste disposal	Major	<u>General</u> • Construction contractors will prepare and implement a Waste Management Plan. • The Supervising Engineers will supervise the implementation of contractors' Waste Management Plan. <u>Solid non-toxic waste</u> • Adequate waste bins will be provided at project sites/camp sites during construction • Final disposal for construction wastes will be at dump sites approved by the local District Assembly. • The rehabilitation works for the research stations/seed centres will include provision of adequate waste bins for use during the operational phase. • Open air burning of wastes will not be allowed under the WAATP during the construction/rehabilitation phase. • MOFA will arrange with Waste Management Companies to handle and dispose wastes from research stations/seed centres. Alternatively, the project may consider the construction of a proper waste disposal sites for the agricultural research stations and other stations to be rehabilitated so that the current open burning practices and indiscriminate disposal are stopped. <u>Scrap materials</u> • Scrap materials from renovation/rehabilitation of buildings (e.g. old rain gutters, roofing sheets, metal fittings etc) will be collected and given out to accredited scrap dealers or disposed of at MMDA approved disposal sites. Scrap materials will not be buried in the area. <u>Waste oil /fuel</u> ▪ Spent or waste oil from construction vehicles and equipment will be collected and temporarily stored in drums or containers at site by the contractor. ▪ Contractor will ensure that waste oil is disposed of by an oil marketing company or recognized agents who have the capacity to undertake oil disposal. <u>Hazardous wastes</u> • Identify and separate hazardous wastes (e.g. asbestos materials, agrochemical containers, expired pesticides, wastes contaminated with oil or oily wastes etc) from all other wastes and temporary store such wastes in separately marked bins or storage areas. • Hazardous wastes will be disposed of in consultation with the EPA and the Environmental Health Unit of the Assembly <u>Human wastes</u>

Potential impact and Risk issues	Impact and Risk Significance	Description of general mitigation actions
		• Contractors in charge of rehabilitation and renovation works will provide toilet facilities for construction workers. This will be made a contractual requirement. • The rehabilitation works of the Agric. Research Stations will include provision of decent and adequate toilet facilities for the use of staff. Currently labourers and technical staff quarters at the stations do not have adequate toilet facilities.
Air pollution	Moderate	• The contractors will use and operate well maintained engines, vehicles, trucks and equipment. A routine maintenance program for all equipment, vehicles, trucks and power generating engines will be in place. • The contractor will ensure the use of good quality fuel and lubricants only. • If dust generation at the construction sites and unpaved access roads through local communities becomes a problem, limited wetting of the affected access roads, project sites and or unloading and reloading points will be done to reduce dust raising. • Speed limits through communities will be limited to ≤50km/hr on unpaved or untarred roads and near or at project site will be ≤30 km/hr). • Engines of vehicles/trucks and earth-moving equipment will be switched off when not in use. • Trucks carrying or delivering soil/sand and cement loads to and from site will be covered to prevent windblown dust from the loads into the communities/atmosphere. • Tipping of sand/laterite or offloading of cement will not be done in a windy or stormy weather conditions to reduce wind transport of sediments.
Noise and vibration	Moderate	• The contractors will 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 made a contractual agreement. . • Contractors will 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, and contractors will avoid unnecessary tooting of horns in communities. • Engines of vehicles/trucks and earth-moving equipment will be switched off when not in use. • Chiseling and demolition activities associated with the rehabilitation/renovation works will be done during non-working hours or days. • As much as possible, the contractor will carry out excavation, demolishing and construction activities during the day and not in the night. • The Contractor will locate its concrete mixer and other construction machines and equipment away from inhabited residential quarters or other sensitive receptors such as schools, offices or health facilities. These equipment/machinery

Potential impact and Risk issues	Impact and Risk Significance	Description of general mitigation actions
		will not be operated behind or near these sensitive receptors but sited about 30m or more away. The siting distance will not result in complaints from the nearest receptors.
Impacts on Landscape and Visual Receptors	Minor	• Where feasible, project sites will be boarded off from public view during construction. • Good house-keeping at construction sites will be implemented, such as regular cleaning, proper and orderly arrangement of materials and equipment, and regular removal and disposal of solid wastes at construction sites and work-camps.
Raw water use	Minor to Moderate	• The contractors will inform and or obtain water abstraction approvals from the WRC if raw water from streams/rivers will be abstracted for used for construction activities. • The contractors will use reliable and acceptable water sources for construction activities
Water pollution and impact on aquatic life	Moderate	• No garbage/refuse, oily wastes, fuels/waste oils will be discharged into drains or at the project areas/ grounds. • Contractors will prepare and 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. • Construction workers/project engineers will be required to report sightings of any injured or dead aquatic life (fishes) in nearby streams/rivers immediately to the district MOFA, regardless of whether the injury or death is caused by a Project activity. The information or report will be shared with the Regional EPA or MOFA WAATP ESSO. • Fuel storage tanks/sites will be properly secured to contain any spillage • Maintenance and cleaning of vehicles, trucks and equipment will take place offsite especially where project sites are close to water bodies. • The Contractors will dispose of excavated or demolished materials or construction wastes, which cannot be reused at sites approved by the MMDAs Waste Management Department. • The Contractors will put in place appropriate sediment barriers on slopes to prevent silt from entering water courses. • Contractors will be required to provide toilet facilities for construction staff to avoid indiscriminate defecation in nearby bush. • The rehabilitation/renovation works will consider the provision of adequate toilet facilities at the labourers, artisanal and technical staff quarters. • MOFA WAATP will not cultivate or develop demonstration farms close to streams but will always observe buffer zones which will take care of siltation issues. • For WAATP farm projects on hills, ploughing or cultivation will be done along the contour to minimise erosion.

Potential impact and Risk issues	Impact and Risk Significance	Description of general mitigation actions
Soil and Land degradation	Minor to Moderate	Land clearing for new construction sites, field demonstration plots will be restricted to demarcated areas as much as possible to avoid unnecessary exposure of bare ground to the elements of the weather. • The Contractors will not carry out excavation or trenching works under aggressive weather conditions such as rains or stormy conditions. • The Contractors will put in place appropriate sediment barriers on slopes to minimise soil erosion. • The contractors will be required to revegetate cleared areas as early as possible
Impact on fauna and habitat	Minor	▪ The contractors will avoid unnecessary exposure and access to sensitive fauna habitat areas ▪ Regular inspection or monitoring of identified or suspected sensitive habitats (e.g. swamps/ wetlands) will be carried out in the area prior to start and during work. ▪ If sensitive habitats are encountered, Project activities will cease and the Project engineers will consult the WAATP Environmental/Social Safeguard Officer (ESSO) to determine the appropriate course of action. The ESSO will engage the Wildlife Division for advice.
Decommissioning of contractor work-camps and sites.	Minor	• Social and Environmental Contract Clauses will be added in bidding documents such as the imperative and conditional agreement to clean up land before handing it over to the Government/MOFA.
Social Environment		
Involuntary displacement	Minor	• Implement the Resettlement Policy Framework (RPF) where possible cases of involuntary resettlement are expected during acquisition of community/individual lands for field demonstration plots and farmer field schools. • With regard to where major encroachments have occurred on project sites including agricultural research fields (e.g. Ashanti Mampong Agricultural Research Station), the government/MOFA will engage the TAs and PAPs under amicable resettlement arrangement in order for MOFA to regain control of the research fields. However, this activity will not be under the WAATP scope and therefore the WAATP ESMF/RPF will not apply
Loss of livelihood	Minor	• If an individual/farmer's farmland is required for a field demonstration plot, the affected person or farmer will be provided with livelihood assistance either in cash or in-kind. It will be done in accordance with the RPF. • Where structures used for business purposes occur on encroached portions of existing project lands, the business owner will be provided with livelihood assistance if his business activities will be interrupted or disrupted by the WAATP project and will be e done in line with the RPF.
Encroachment risk	Moderate to Major	• MOFA will engage and educate traditional authorities in charge of MOFA research stations lands and landlords of beneficiary communities not to sell or give away or allow community members to encroach on MOFA project lands or

Potential impact and Risk issues	Impact and Risk Significance	Description of general mitigation actions
		WAATP project sites.
Employment and Women marginalisation	Moderate	• Contractors will use local labour as much as possible and where available. All unskilled labour will be contracted or obtained from the local communities. • The contractors will be required to engage women during the construction phase as part of their recruitment policy. . • MOFA-WAATP will involve or engage women and the youth as part of its programme goals/targets. • Access to improved variety of seeds and seedlings as well as fertilizers and other chemicals needed to improve agricultural methods, will be enhanced by making them affordable to women farmers. • Women farmers will 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.
Deprivation of use of land	Minor	• Due process will be followed to establish the true owner of any land, be it family or stool land or individual for new project sites. Once established, the project will properly acquire the site. The compensation for the acquisition or temporary occupation will be based upon the provisions of the RPF. • Where individual's farmlands will have to be used as field demonstration plots, appropriate compensation will be paid to the owner in cash or in-kind for release of land for the project in line with the RPF.
Loss of structures/ properties	Minor to Moderate	• For project sites to be used, irrespective of the land compensation, appropriate compensation will be paid to the owners for any structures/ properties/standing crops that will be affected. This will be done in accordance with the provisions of the RPF. • Where private structures or farms occur on existing project sites or agricultural research station fields (E.g. Ashanti Mampong Agricultural Research Station), and such structures or farms will have to be demolished or destroyed under the WAATP, appropriate compensation will be paid for the affected structures or standing crops in line with the provisions of the RPF.

Potential impact and Risk issues	Impact and Risk Significance	Description of general mitigation actions
Impacts on Public Health/ Safety, Traffic and Sanitation	Major	• Appropriate notices and warning signs will be erected around working areas and public areas to warn prospective trespassers of any danger or risk during the rehabilitation and construction • 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 will be used • Only experienced drivers/operators will be employed • The Contractors will hoard off construction sites if possible to prevent access by unauthorised persons. • Construction drivers and equipment operators will install or place warning signs near breakdown vehicles/equipment on access routes • 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. • Speed limit for all vehicles and construction equipment will be 30km/h or less at the project sites and 50km/h or less when moving through the local communities. • The Contractors will ensure that delivery trucks hired or contracted from third parties are in good condition to prevent breakdowns on roads. • 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. • The contractors will provide adequate sanitary/toilet facilities for workers, and open range defecation will not be countenanced. • Construction workers will be educated to adhere to basic rules with regard to protection of public health, including most importantly hygiene and disease (HIV) prevention, indiscriminate disposal of wastes. • Educate farmers in the proper use of pesticides and disposal of expired pesticides and pesticide containers • Train farmers in the correct use of PPEs for pesticide handling and educate farmers never to taste pesticides and not to apply pesticides when not in the appropriate PPEs. • MOFA-WAATP will make provision for emergency response to pesticide accidents and poisoning • WAATP will not have demonstration farms or farmer field schools near schools, hospitals or populated centres in order to avoid wind -blown fugitive pesticide sprays to such populated areas.
Impacts on cultural heritage/ecologically sensitive areas	Minor to Moderate	• Before handing over of project sites to contractors, MOFA and the project engineering consultant will carry out pre-construction surveys to identify cultural heritage resources and existing ecologically sensitive areas that the project will avoid and take adequate care/notice of.

Potential impact and Risk issues	Impact and Risk Significance	Description of general mitigation actions
		• Discuss and agree with owner/community if a cultural heritage resource identified can be relocated if possible. The relocation of any cultural heritage resource will be done in line with the provisions of the RPF. • The Project will 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.
Impacts on Worker Health and Safety	Major	• The Project will require all contractors to implement an Environmental, Health and Safety Plan (EHSP), which will outline procedures for avoiding health and safety incidents and for emergency medical treatment. This will be a contractual requirement. . • Contractors will use suitable Personal Protective Equipment (PPE) including hard hats, high-visibility vests, safety boots and gloves and life vests as appropriate in accordance with the EHSP. • The Contractors will be required to train their staff/workers in the safe methods pertaining to their area of work to avoid injuries. • MOFA will install some streetlights at the stations to improve night illumination and security.
Community/ ongoing Stations work disruption	Moderate	• Contractors to provide timely information on their work schedule to existing agricultural research/seed/ veterinary stations workers. • MOFA-WAATP to provide timely information to communities with regard to programme for field demonstration plots, farmers field schools and construction schedule for new project sites. • District MOFA to schedule regular meetings or interactions with the community • District MOFA to provide contact information on key persons on projects to local communities for contacting if necessary • MOFA-WAATP to implement grievance redress mechanisms and provide contacts of grievance redress committee members to local communities

Framework Environmental and Social Management Plan

Environmental Screening and Assessment Process

A screening process, selection and evaluation of WAATP projects are required to manage environmental and social aspects of these activities. MOFA will use the screening and assessment process provided below in the table for all projects under WAATP.

Summary of Environmental Screening and Assessment Process and Responsibilities

No.	Stage	Institutional responsibility	Implementation responsibility
1.0	Preliminary screening of Infrastructure sub-projects to determine their safeguards requirements and also assist in project formulation using checklist	MOFA	Regional/District MOFA officers and Environmental /Social Safeguard Officer (ESSO)
1.1	Advise on which WAATP projects to register with the EPA following preliminary screening	EPA	Regional or National EPA
1.2	Statutory Environmental Registration of WAATP sub-project	MOFA	WAATP-ESSO
2.0	Determination of appropriate environmental assessment level/ category.	EPA	National EPA
3.0	If ESIA is necessary		
3.1	Preparation of terms of reference	MOFA	ESSO
3.2	Validation of ESIA/ESMP ToR	EPA/World Bank	-
3.3	Selection of Consultant	WAATP-MOFA/ Procurement Office	ESSO/ Procurement Officer
3.4	Preparation and publication of Scoping Reports	Consultant	-
3.5	Preparation of ESIA report	Consultant	-
4.0	Review and Approval of ESIA	WAATP/EPA/ World Bank	WAATP - ESSO
4.1	Issuance of environmental permit for project implementation	EPA	-
4.2	Public Consultation and disclosure	MOFA/EPA/ World Bank	ESSO/Contractor/ Consultant
5.0	Implementation of ESIA	MOFA	ESSO/ Project implementers
6.0	Surveillance and monitoring	MOFA/EPA/ World Bank	ESSO, M&E Officer, EPA

Monitoring indicators and responsibilities

Monitoring indicators 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, implementation criteria, monitoring indicators, verification, and responsibilities by parties involved in the WAATP subproject implementation.

Institutional arrangement for the implementation of the ESMF

The WAATP will be implemented by the Ministry of Food and Agriculture (MoFA), where the Project Coordinating Unit (PCU) will be hosted. The key implementing entities include:

- MOFA
- Project Steering Committee
- WAATP Project Coordinating Unit (PCU)
- Metropolitan/Municipal/District Assemblies (MMDAs)
- Environmental Protection Agency (EPA)
- Lands Commission
- Private Sector – Consultants and Contractors
- Donor – World Bank

The WAATP PCU will comprise of the following key experts:

- Project coordinator:
- Environmental/Social Safeguards Specialist
- Communication Specialist
- Procurement Specialist
- Technical Specialist
- Financial Management Specialist
- Monitoring and Evaluation Specialist

Institutional capacity and implementation cost

The capacity building requirements will mostly be in the form of training programmes. Training workshops on the ESMF/RPF and the World Bank safeguard policies of OP 4.01, OP 4.12 and OP 4.09 would be organized for MOFA (WAAPP PCU and head office focal persons, and regional/district MOFA offices), research stations/seed centres, beneficiary farmers and Farmer Based Organizations (FBOs), Civil Society Organizations (CSOs) as well as Metropolitan/Municipal/District Assemblies (MMDAs) and the Private sector (Project consultants/contractors). The following additional training areas have been identified:

- 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.

The total cost to implement the ESMF is estimated at US$140,000.

Consultations and Disclosure on the ESMF

As provided under WB safeguard policy OP 4.01, consultations and disclosure on the WAATP ESMF will be organized as follows:

Consultations

- Organize workshops, community forum etc for stakeholders to make meaningful inputs/contributions into the ESMF before its finalized; or

- Circulate the draft ESMF for comments to all relevant institutions (e.g. WAAPP-MOFA, relevant MOFA directorates involved with the WAATP, Water Resources Commission, Lands Commission, EPA, Ministry of Local Government & Rural Development/MMDAs, and the World Bank; and
- Also, one-on-one consultations can be organized with major stakeholders or institutions.

Disclosure

- Publication in the dailies, community bulletin boards (especially at project communities), workshops, community forums/radio presentations
- Distribution of the cleared ESMF to stakeholders (e.g. relevant district assemblies, district/regional MOFA offices, regional EPA offices)
- Publication of the cleared ESMF at the World Bank and MOFA websites

1.0 INTRODUCTION

1.1 Background

The West African Agricultural Productivity Program (WAAPP) has completed the second of two five-year phases. The Project has been assessed as successful and tagged as a flagship of the World Bank (WB) and the Economic Community of West African States (ECOWAS) Regional Integration Program. The development objective of the program was to contribute to agricultural productivity increase in the participating countries' top commodity sub- sectors that are aligned with regional priorities. The Project had four components namely:

(i) enabling conditions for regional cooperation in technology generation and dissemination,
(ii) National Centre of Specialization,
(iii) Demand-driven technology generation and adoption, and
(iv) Project coordination, management, monitoring and evaluation.

Among the achievements of the project, which was ran in 13 ECOWAS states over the period between 2007 and 2017 were the generation and dissemination of over 200 technologies, reaching 875,920 direct beneficiaries of which 41.5% were women, and accelerating agricultural productivity.

The proposed West Africa Agricultural Transformation Program (WAATP) is among the projects, which supports the International Development Association (IDA) 18 Business Plan for West Africa. It is designed to take forward the unfinished business of WAAPP and to help bridge identified gaps as well as champion a course that will transform agriculture in Ghana and ECOWAS. The overall objective of WAATP is to strengthen regional agricultural innovations system to facilitate mass adoption of climate smart technologies by producers, enhance job creation for the youth and value chain actors' access to regional markets for targeted agricultural products. The project aligns very well with the priorities of the Government of Ghana (GoG) to among others create jobs for the youth. It has five components namely: (i) Strengthening the New Model of Innovation Delivery in West Africa; (ii) Accelerating Technology Adoption and Job Creation using Demand-Driven Market-Based Approaches; (iii) Policies, Markets and Institutional Strengthening; (iv) Contingent emergency response; and (v) Project Management, Learning, Monitoring and Evaluation.

The Government of Ghana, in collaboration with West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and the World Bank, has therefore undertaken the preparation of the WAATP for Ghana under World Bank funding. Consequently, Ghana is required to develop the following safeguard instruments: (i) an Environmental and Social Management Framework (ESMF) that would include both "chance finds" procedures and provisions for both forest resources and natural habitats; (ii) a Pest Management Plan (PMP); and (iii) a Resettlement Policy Framework (RPF).

1.2 Objective of the Assignment

The objective of this assignment is to contribute to the Strategic Environmental Assessment of the WAATP and to the preparation of its Environmental and Social Management Framework (ESMF).

More specifically, it will review the national context and establish technical instruments for assessing, analysing and evaluating environmental and social impacts of research and development activities in the country. Subsequently the study will define/suggest appropriate mitigation measures by either avoiding, eliminating, or reducing such adverse environmental and social impacts.

1.3 Purpose of the ESMF

This ESMF seeks to establish a process of environmental and social screening which will permit MoFA and its implementing agencies to identify, assess and mitigate the environmental and social impacts of the proposed interventions. The ESMF also determines the institutional arrangements and coordination to be followed during the program implementation, including those relating to capacity building to enhance the implementation of this ESMF.

1.4 Rationale for the ESMF

The Ghana Environmental Assessment Regulation 1999, LI 1652, provides the list of projects for which some form of environmental assessment is required. Some of the projects under WAATP will fall under this category. Generally, the WAATP falls under World Bank category B and C Projects. Specific projects have not been clearly identified at this stage, hence an ESMF provides a general impact identification framework to assist project implementers to screen the projects and institute measures to address adverse environmental and social impacts. Specific information on country-wide project locations, land requirements, bio- physical features etc when known at a later stage may trigger the preparation of specific safeguards instruments such as the Environmental and Social Impact Assessment (ESIA) reports.

1.5 Scope of the ESMF

The Scope of the ESMF entails the following:

- Legal and regulatory framework on the management of environmental and social impacts.
- Potential environmental and social impacts and risks.
- Types of impacts and suitable mitigation measures.
- Environmental Assessment Process.
- A monitoring plan and indicators.
- Institutional arrangements, capacity requirements and budget for implementation of the ESMF.
- Stakeholder consultations and public disclosure requirements.
- Grievance Redress Mechanism.
- Monitoring and evaluation mechanism.

1.6 Approach and Methodology for the preparation of the ESMF

The ESMF has been prepared in accordance with applicable World Bank safeguard policies and Ghana environmental assessment guidelines which involve the following activities:

- Literature/Document Review;
- Field visits/consultations with relevant sector institutions;
- Data collation, analysis and preparation of reports

1.6.1 Literature/Document Review

The following relevant documents were reviewed:

- Ghana policies and regulations regarding environmental/social assessment.
- World Bank Safeguard Policies.
- ESMFs prepared for some recent World Bank projects in Ghana (e.g. MOFA-GCAP, Greater Accra Metropolitan Area (GAMA) Water Supply and Sanitation Project, Ghana Forestry Commission REDD+ Mechanism, Ghana Small Town Water Supply and Sanitation Project).

1.6.2 Field visits/Consultations

The Consultant visited two agricultural research station sites between 28th February and 2nd March, 2018 to observe baseline conditions and engaged the station managers to discuss and appreciate the likely environmental/social issues that are likely to come up during the rehabilitation works. The selection of the sites were informed after discussions with the MOFA Crop Services Directorate concerning sites which are likely to have potential environmental/social issues during rehabilitation works.

Consultations were carried out with the WAAPP-PCU, some key Directorates of MOFA, EPA, Town and Country Department of the Ashanti Mampong Municipal Assembly to learn lessons from the WAAP, discuss the WAATP and solicit concerns and suggestions for successfully implementation of the WAATP in an environmentally sound and socially acceptable manner. Details of the stakeholder engagement are provided in Section 9 and pictures from the field visits are provided in the stakeholder consultation report and field pictures in **Annex 7**.

1.6.3 Data Collation, Analysis and Preparation of Report

Data and information gathered from the literature reviews, field visits and consultations, which are in line with the requirements under the scope of works, were organized into this ESMF report. The ESMF has the following major sections:

- Executive summary

1. Introduction
2. Description of WAATP
3. Policy, Legal and Institutional Framework
4. Brief Ghana Baseline Conditions
5. Risks and Potential Environmental and Social Impacts
6. Mitigation Guidelines
7. Environmental and Social Management Plan
8. Institutional Capacity for ESMF Implementation and Budgetary Provisions
9. Public Consultations and Information Disclosure
10. Grievance Redress Mechanism
11. Monitoring and Evaluation
12. Bibliography
13. Annexes

2.0 DESCRIPTION OF THE WEST AFRICA AGRICULURAL TRANSFORMATION PROGRAM

2.1 Development Objective

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

2.2 Project Component and Scope

The proposed WAATP will comprise the following five key components:

(i) Strengthening the new model of innovation delivery in West Africa;

(ii) Accelerating mass adoption of technologies and enhancing job creation in the agricultural sector;

(iii) Policies, markets and institutional strengthening;

(iv) Contingent emergency response; and

(v) Project management, learning, monitoring and evaluation.

2.2.1 Component 1 - Strengthening the New Model of Innovation Delivery in West Africa

The component aims to strengthen the National Centres of Excellence supported under WAAPP and upgrade them to become ECOWAS Regional Centres of Excellence (RCE) for research focusing on priority lines of research to be addressed regionally. The RCE will play a key role on ensuring a solid link with Consultative Group on International Agricultural Research (CGIAR) research system, the private sector and the networking of national agricultural research and extension systems to deliver in a sustainable manner improved technologies and innovation -which will be screened to ensure that they are climate smart and gender sensitive- for scaling up. This component will also support the following:

a) provide additional infrastructure, equipment and grants for research activities (climate smart technologies, nutrition including biofortification, soil health, etc.);
b) capacity building of the Regional Centre of Excellence (RCE) network institutions in each; academic training for the next generation of scientists and for research technicians; MOUs with the CGIAR centres and other advance institutions for capacity building, technical backstopping, joint research activities and dissemination of CGIAR technologies;
c) establishment of a Centre of Excellence for Mechanization that would support a new model of mechanization strategy for West Africa including the promotion of zero tillage, private sector led mechanization, mechanization service centres;
d) annual planning and result sharing workshops organized by each RCE;
e) Provision of small grants to research teams to develop and adapt technologies which respond to value chain actors' needs.

2.2.2 Component 2 - Accelerating Technology Adoption and Job Creation using Demand-Driven Market-Based Approaches

This component aims at scaling up adoption of innovations that will accelerate productivity increases, improve climate resilience, reduce post-harvest losses, promote value addition, and accelerate job creation for the teeming youth. This has two sub-components;

- **Sub component 1**. **Demand-driven market-based mass adoption and technologies and innovations**.

The component will support:

a) strengthening of private and public extension services and their networking at regional level;
b) scaling up the use of Information-Communication-Technology (ICT) and innovations in outreach (E-extension and E-voucher schemes; electronic technology market etc.) including regional geo-spatial targeting of release technologies adoption and tracking of performance,
c) promotion of multi stakeholder platforms (Innovation Platforms, productive alliances, etc.) with the private sector playing a key role including using processing and marketing activities as conduits for new technology adoption;
d) upgrading of the national seed systems and the regional seed market;
e) development of soil maps and fertilizer blending;
f) promotion of south-south collaboration activities with other sub regions in Africa as well as with Asia, and Latin America;
g) Organization of national and regional technology fairs;
h) piloting and scaling up innovative ways to address rural finance in collaboration with International Finance Corporation (IFC), and commercial Banks; this would include leasing for mechanization and post-harvest equipment, inventory credit schemes (warrantage), risk sharing facility, etc.; and
i) implementation of a regional communication for development action plan which will address informational needs of farmers and other value chain actor and facilitate behaviour change.

Sub-component 2: Jobs for the youth. The sub-component aims to scale up employment for youth using the regional pool of technologies and best practices in collaboration with the private sector. The sub component will support:

- a stocktaking of youth employment programs by typology of youth and the development of a regional strategy and national action plans to scale up best practices in job creation for the youth;
- establishment of public and private sector led incubation systems/ hubs/centres (such as the Ibadan University and IITA) including in each centre of excellence;
- regional and national matching grants to support job creation including training and start up kits for young entrepreneurs and small medium-sized enterprises (SMEs);
- networking of the SMEs and development of a mentorship program at national and regional level to set up viable SMEs building from successful models; and
- preparation of business models and business plans to support job creation.

2.2.3 Component 3- Policies, Markets and Institutional Strengthening

This component aims at creating an enabling policy environment to accelerate agricultural transformation, connect production to market and strengthen regional integration. Component 3 has three sub-components as follows;

Sub-component 1: Regional policies and regulations. The sub component will support both activities launched under WAAPP as well as new areas of policy reforms necessary to accelerate agricultural transformation by supporting the under listed:

- stocktaking of the implementation of the regional regulations on seeds, pesticides, fertilizer and veterinarian products and implementation of the resulting action plan, building on existing regional initiatives and effective implementation at country level;
- studies and regulatory reforms to establish a sustainable agricultural development fund;
- a regional study on land tenure system in West Africa and sharing of lessons learned including best practices to facilitate women and youth access to land, as well as implementation of the resulted action plan; and
- update of the existing common strategies and action plans for gender, communication, climate change and nutrition.

The component will also focus on other activities including:

- regulatory reform and increased coordination to address non-tariff barriers to regional trade and integrating regional markets through, for example, adoption of simple and modern regulatory standards, conformity assessment that reduce duplication etc.;
- studies to identify best practice for implementing effective regulatory reforms;
- review of the regional trade policies and development of an action plan for their update and/or dissemination; and
- implementation of an action plan to promote a more enabling environment for the private sector engagement in regional trade in food crops including strengthening the Permanent Interstate Committee for Drought Control in the Sahel (CILLS) road blocks observatory and support to the implementation of regional trade regulations.

Sub-component 2: Regional Markets Development. This sub component aims to promote regional trade of targeted marketed products in order to accelerate import substitution in coastal countries (supply meat, fruits and vegetables, rice, etc.) and accelerate food self-sufficiency in Sahelian countries (supply of roots and tuber, plantain, maize, fish etc. by supporting the under listed:

- regional market studies for priority commodities and resulted action plan based on a combination of analytic work and interviews with private investors and other stakeholders;
- integrated solutions for value chain development opportunities that involve cross-border flows of agricultural products;
- establishment of regional multi-stakeholder initiatives - trade knowledge platforms, regional trade facilitation assessments, monitoring of trade facilitation and trade logistics reform, improved SPS procedures, improved information flows on regional food markets etc. – to help build institutions and address political economy constraints that expand markets and enable private investments in agriculture, agribusiness, and trade;
- set-up of a regional warehouse receipt system and private sector-driven regional commodities exchange markets for priority food crops; and

- scaling up of the regional seed market and its use by Governments in the sub region.

Sub-component 3: National Regional Institutional capacity building. The sub-components aim to strengthen regional institutions capacity to develop policies related agricultural transformation in the sub region and ensure their dissemination to decision makers and relevant stakeholders. The sub component will support:

- ECOWAS Commission for Agriculture establish a policy analysis unit, that is able to assess the implementation of regional policies, coordinate their implementation and design new policies, conduct regional benchmarking and impact studies to influence ECOWAS council of Ministers for Agriculture in taking informed policy decisions;
- strengthen CORAF policy analysis unit to conduct specific studies and develop regional policy briefs on key reforms identified during project implementation, disseminate the results of Enabling Business in Agriculture (EBA) at regional level and work with IFPRI to monitor agricultural growth increases in ECOWAS region;
- strengthen participating countries capacity in common policy design and reforms to modernize extension services, improve efficiency of input subsidy schemes, and any other relevant reforms; and
- support activities of citizen engagement to facilitate civil society involvement in project activities.

2.2.4 Component 4 - Contingent Emergency Response (CER)

This component, known as the Contingent Emergency Response Component (CERC), will be available should the need arise to redirect some of the project resources to contribute with other projects in the Chad portfolio to respond to an eligible emergency or crisis. The available resources would be made available to finance emergency response activities and to address crisis and emergency needs. A management procedure will be defined in an Immediate Response Mechanism Operational Manual (IRM/OM), to be prepared separately and approved by the World Bank, in line with guidance.

2.2.5 Component 5- Project Management, Learning, Monitoring and Evaluation

This component will ensure the project is efficiently managed and performance as well as impacts carefully tracked. This will build on the successful institutional arrangements mechanisms of WAAPP.

- It will be coordinated at the national levels by existing national Coordinating units, which successfully coordinated the implementation of WAAPP; and
- at the regional level by CORAF based on a well-defined mandate agreed by the Regional Steering Committee (RSC) in the Annual Work Plan and Budget (AWPB).
- This component aims to ensure that the project is efficiently managed and performance and impact are carefully tracked. The component would support annual foresight conferences, training of national counterparts to contribute to the analytical work, regular monitoring (by Agricultural Science and Technology Indicators – ASTI, and national counterparts) of expenditure on R&D (to compare to allocation), measurement of productivity, monitoring of jobs created and project management, impact analysis etc.

2.3 Potential Projects of Environmental and Social Concerns

Review of project documents and consultations with officials of WAATP-MOFA informed the identification of relevant works and services that are likely to generate environmental and social concerns.

2.3.1 Rehabilitation/Renovation Works

The WAATP will involve the following:

- Renovation of two existing agricultural stations at Mampong and Asuansi in the Ashanti and Central Regions respectively;
- Renovation of two existing veterinary quarantine stations at Bawku and Ho in the Upper East and Volta Regions respectively;
- Rehabilitation of two seed centres at Bolgatanga and Wa in the Upper East and Upper West Regions respectively; and
- Rehabilitation of some government and privately-owned warehouses in the country.

2.3.2 New Developments and Services

Demonstration Plots/Farmers Field Schools

WAATP will:

I. establish community demonstration plots on proven Climate Smart Agriculture (CSA) technologies for vegetables, cereals, legumes and root and tuber crops to farmers; and
II. establish farmers field schools of CSA practices on identified commodities.

The Department of Agricultural Extension Services (DAES) would work with the decentralized departments to establish Community Demonstration Plots and Farmer Field Schools (FFS). The project will use demonstration plots managed by private and successful aggregators as points for dissemination of improved varieties to out-growers. The aggregators will be supported by the project with seed varieties and planting materials, fertilizers and extension support.

New Seed Centres and Support to Agricultural stations

WAATP may construct new seed conditioning (including processing and branding) centres. DAES through the various MMDA and regional Agricultural directorates would facilitate the cultivation of roots and tubers, cereals and legumes in the MMDAs to be adopted by the project over the 5 year period. The service would facilitate at least 4 visits to fields on yearly basis to monitor and render further technical backstopping to planting materials developers.

Service points

Service Centres will be developed around registered and successful aggregators to be point of provision of technologies for mass adoption. The technologies will include improved varieties of prioritized commodities (rice, maize, soya, sorghum, vegetables groundnut and cassava), hand-held mechanization equipment for land preparation, irrigation, harvesting and postharvest management, and transport of input and produce. The service points will be privately managed by selected successful aggregators and input dealers in partnership with selected financial institutions

Agri-businesses/Incubation Centres and Greenhouse Technology

The project will set up platforms where new and start-up agri-businesses will be mentored and supported. The projects will establish incubation centres for private sector participation in fish, fisheries and aquaculture systems and vegetable production. The incubation centres to be established by the project will be mainly private sector led. Some will also be facilitated under PPP arrangement. The Project will also seek to promote the use of greenhouse technology for the production of vegetables as business to the youth.

2.3.3 Research Programmes/Activities

WAATP will support the promotion of research uptake. Implementing Agencies including CRI, SARI will support some farmers to take up the micro-propagation of root and tuber technology, to take up the bio fortified, and the CSA technology. CRI, SARI and RCoEs would lead a process of promoting adaptive research and innovative platforms through a competition process to instill quality, efficiency and effectiveness into product development.

3.0 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 National and Sector Policy Framework

Ghana Shared Growth and Development Agenda- (GSGDA), 2010

There have been several policies and program to accelerate the growth of the economy and raise the living standards of Ghanaians in the past which have been pursued with varying degrees of success. These include Ghana Vision 2020: The First Step (1996-2000); the First Medium-Term Plan (1997- 2000); Ghana Poverty Reduction Strategy (2003-2005); and the Growth and Poverty Reduction Strategy (2006-2009).

The Ghana Shared Growth and Development Agenda provides for the Vision for the Agricultural, Environment and Natural Resource Sectors in Chapter four of the document. The main focus of the agricultural sector is to accelerate the modernization of agriculture and ensure its linkage with industry through the application of science, technology and innovation. The modernized agriculture sector is expected to underpin the transformation of the economy through job creation, increased export earnings, food security, and supply of raw materials for value addition and rural development as well as significant reduction in the incidence of poverty.

National Land Policy (NLP), 2007

The policy is conservation sensitive with potential for ecosystem maintenance, biodiversity and scenic preservation under protection and leaving management of such lands under the collaborative effort of major stakeholders including the government and the community. Key aspects of Section 4.4 (Ensuring Sustainable Land Use) of the Policy relevant to WAATP are provided below:

- The use of any land in Ghana for sustainable development, the protection of water bodies and the environment and any other socioeconomic activity will be determined through national land use planning guidelines based on sustainable principles in the long term national interest.
- Land categories outside Ghana's permanent forest and wildlife estates are available for such uses as agriculture, timber, mining and other extractive industries, and human settlement within the context of a national land use plan.
- All land and water resources development activities must conform to the environmental laws in the country and where Environmental Impact Assessment report is required this must be provided. Environmental protection within the 'polluter pays' principle will be enforced.

Forest and Wildlife Policy, 2012

The policy aims at the conservation and sustainable development of forest and wildlife resources for the maintenance of environmental stability and continuous flow of optimum benefits. The objectives of the policy are to manage and enhance the ecological integrity of Ghana’s forest, savannah, wetlands and other ecosystems; to promote the rehabilitation and restoration of degraded landscapes through plantations development and community forestry; to promote the development of viable forest and wildlife based industries and livelihoods; and to promote training, research and technology development that supports sustainable forest management.

National Environmental Policy (NEP), 2012

The objective of this policy is to promote healthy lifestyles and reduce risk factors that arise from environmental, economic, social and behavioral causes thereby promoting healthy lifestyles in a healthy environment. The NEP seeks to address major environmental threats jeopardizing the natural and common resource base of the country and has integrated the most urgent environmental concerns of present time to provide clear strategies for overcoming existing hurdles.

National Climate Change Policy (NCCP), 2012

The vision of the National Climate Change Policy is to ensure a climate-resilient and climate-compatible economy while achieving sustainable development through equitable low-carbon economic growth for Ghana. The three objectives of the NCCP are (1) effective adaptation, (2) social development and (3) mitigation. Four thematic areas have been identified to address the adaptation issues in Ghana. These are (1) energy and infrastructure, (2) natural resources management, (3) agriculture and food security, and (4) disaster preparedness and response.

National Water Policy, 2007

The National Water Policy, approved in June 2007, is to provide the framework for the sustainable development of water resources in Ghana. The overall goal of the policy is to "achieve sustainable development, management and use of Ghana's water resources to improve health and livelihoods, reduce vulnerability while assuring good governance for present and future generations."

Riparian Buffer Zone Policy, 2014

The Water Resources Commission (WRC) launched a national policy document on Riparian Buffer Zone Protection for managing freshwater bodies in the country in May 2014. It aims at providing comprehensive measures and actions that would guide the creation of vegetative buffers for the preservation and functioning of the nation's water bodies and vital ecosystems.

Recommended buffer widths for water bodies are municipal reservoir shoreline protective areas such as Weija Dam and Lake Bosomtwe covering 60 to 90 metres; major perennial rivers/streams such as the Volta, Offin and Tano, 10 to 60 metres and streams within forest reserves, 10 to 50 metres.

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

The revised policy (FASDEP II) emphasises 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.

Ghana's Seed Policy, 2013

Ghana has developed a comprehensive national seed policy. The main objective of the National Seed Policy is to support the development and establishment of a well-coordinated, comprehensive and sustainable private sector-driven seed industry through systematic and strategic approaches which would continuously create and supply new improved varieties for use by farmers and, further, support

successful seed production, certification, marketing and seed security systems which will form the basis for food security and support the overall development of the agricultural sector.

Medium Term Agriculture Sector Investment Plan (METASIP), 2010

The METASIP is the investment plan to implement the medium term (2011-2015) programmes of the Agriculture Policy. The METASIP is consistent with the ECOWAS Agriculture Policy and NEPAD´s Comprehensive Africa Agriculture Development Programme (ECOWAP/CAADP) which provide an integrated framework to support agricultural growth, rural development and food security in the African region.

National Employment Policy, 2014

The policy indicates that the key source of demand for labour emanates from the productive sectors of the economy, namely, agriculture, industry and service. One of the key strategies of the employment policy is to promote farm and non-farm rural employment through modernisation of agriculture, improving the productivity of farmers and contract farming arrangements, promoting effective linkages between farm and non-farm activities among others.

Occupational Safety and Health Policy of Ghana (Draft)

The policy statement of the OSH Policy (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 policy is derived from provisions of the International Labour Organization (ILO) Conventions 155 and 161. The policy document has specific sections on objectives, scope, strategies, activities promotion and awareness creation.

National Workplace HIV/AIDS Policy

The broad 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.

3.2 Regulatory Framework

The Constitution of the Republic of Ghana 1992

Article 36 (9) states that "The State shall take appropriate measures needed to protect and safeguard the national environment for posterity; and shall seek co-operation with other states and bodies for purposes of protecting the wider international environment for mankind." The Constitution also make provisions that protect the right to private property and sets principles under which citizens may be deprived of their property in the interest of the public.

Ghana Investment Promotion Centre Act 1994, Act 478

The Ghana Investment Promotion Centre Act 1994 (Act 478) requires that every investor wishing to invest in the country must in its appraisal of proposed investment projects or enterprises, "…have regard

to any effect the enterprise is likely to have on the environment and measures proposed for the prevention and control of any harmful effects to the environment...".

Environmental Protection Agency Act 1994, Act 490

The Environmental Protection Agency (EPA) Act 1994 (Act 490) provides for the establishment of an Environmental Protection Agency with functions among others, to 'advise the minister on the formulation of policies on all aspects of the environment and in particular make recommendations for the protection of the environment'. The EPA Act 1994 (Act 490) also gives mandate to the Agency to ensure compliance of all investments and undertakings with laid down Environmental Assessment (EA) procedures in the planning and execution of development projects, including compliance in respect of existing ones.

Environmental Assessment Regulations 1999, LI 1652

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. Part 1 of the Environmental Assessment Regulations, 1999 LI 1652 on Environmental Permit describes undertakings requiring registration and issuance of environmental permit, as:

'1. (1) No person shall commence any of the undertakings specified in Schedule 1 to these Regulations or any undertaking to which a matter in the Schedule relates, unless prior to the commencement, the undertaking has been registered by the Agency and an environmental permit has been issued by the Agency in respect of the undertaking.

2. No person shall commence activities in respect of any undertaking which in the opinion of the Agency has or is likely to have adverse effect on the environment or public health unless, prior to the commencement, the undertaking has been registered by the Agency in respect of the undertaking.'

The list of undertakings requiring environmental assessment is provided in the **Annex 1** together with the list of environmentally sensitive areas **(Annex 2)** in which developments are to a large extent, prohibited. The administrative flow chart suggesting a total environmental assessment process time of 90 days is shown in **Annex 3**. The environmental assessment procedures are statutorily recognised under the EPA Act 1994 (Act 490).

Fees and Charges (Amendment) Instrument, 2015 (LI 2228)

The Fees and Charges (Amendment) Instrument 2015, LI 2228 provides comprehensive rates, fees and charges collectable by Ministries, Departments and Agencies for goods and services delivered to the public.

Water Resources Commission Act 1996, Act 522

The Water Resources Commission (WRC) Act 1996 (Act 522) establishes and mandates the WRC as the sole agent responsible for the regulation, management and utilization of water resources and for the co-ordination of any policy in relation to them. The Commission does this through the granting of water rights to potential water users.

Water Use Regulations 2001, LI 1692

The Water Use Regulations 2001 (LI 1692) enjoins all persons to obtain Water Use Permits from the Water Resources Commission for commercial water use. The Commission is also mandated to request for evidence that an environmental impact assessment or an environmental management plan has been approved by the EPA before issuance of the Water Use Permit.

Lands Commission Act 2008, Act 767

The Lands Commission Act 2008 re-establishes the Lands Commission to integrate the operations of public service land institutions in order to secure effective and efficient land administration to provide for related matters. The objectives of the Commission include among others to:

- Promote the judicious use of land by the society and ensure that land use is in accordance with sustainable management principles and the maintenance of a sound eco-system; and
- Ensure that land development is effected in conformity with the nation's development goals.

Currently, the Commission has the following divisions:

- Survey and Mapping
- Land Registration
- Land Valuation
- Public and Vested Lands Management.

The State Lands Act 1962, Act 125

The State Lands Act 1962 (Act 125) has vested authority in the President of the Republic of Ghana to acquire land for the public interest via an executive instrument.

The Local Governance Act, 2016, Act 936

The Local Governance Act, 2016, Act 936 replaces the Local Government Act, 1993 (Act 462) and also harmonizes other existing legislations on local governance and provides a one stop shop document on all local governance issues. The Act establishes and regulates the local government system and gives authority to the Regional Coordinating Council (RCC) and the District Assembly to exercise political and administrative power in the Regions and District, provide guidance, give direction to, and supervise all other administrative authorities in the regions and district respectively. The Assembly is mandated to initiate programmes for the development of basic infrastructure and provide municipal works and services as well as be responsible for the development, improvement and management of human settlements and the environment in the district.

The Labour Act 2003, Act 651

Section 118(1) of the Labour Act 2003 (Act 651) stipulates that it is the duty of an employer to ensure that every worker employed works under satisfactory, safe and healthy conditions.

Workmen's Compensation Law, 1987 (PNDCL 187)

The Workmen's Compensation Law, 1987 holds employers responsible for the payment of compensation to workmen for personal injuries caused by accidents arising out and in the course of their employment. Regulations passed under PNDCL 187 extend the requirements for the payment of compensation to incapacity or death arising from occupational diseases.

Factories, Offices and Shops Act 1970, Act 328
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.

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

Plants and Fertilizer Act 2010, Act 803
The Act provides for the efficient conduct of plant protection to prevent the introduction and spread of pests and diseases, to regulate imports and exports of plants and planting materials; the regulation and monitoring of the exports, imports and commercial transaction in seeds and related matters; and control and regulation of fertilizer trade.

3.3 Key International Conventions ratified by Ghana

The relevant international conventions ratified by Ghana include:
- United Nations Framework Convention on Climate Change
- Convention on Biological Diversity
- United Nations Convention to combat Desertification
- International Plant Protection Convention
- Convention on Wetlands - The Ramsar Convention
- World Heritage Convention - WHC
- International Code of Conduct for the distribution and use of FAO pesticides
- International Standards for Phytosanitary Measures (ISPM) FAO
- The Montreal Protocol
- Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES
- The International Treaty on Plant Genetic Resources for Food and Agriculture
- African convention on the conservation of nature and natural resources (Revised)

3.4 Institutional framework

<u>Ministry of Food and Agriculture</u>
The Ministry of Food and Agriculture (MOFA) is the ministry responsible for the development and growth of agriculture. The primary roles of this ministry are the formulation of appropriate agricultural policies, planning and coordination, monitoring and evaluation within the overall economic development. Currently, MOFA has the following technical directorates:
- Directorate of Crops Services (DCS)
- Directorate of Agricultural Extension Services (DAES)
- Plant Protection and Regulatory Services Directorate (PPRSD)
- Veterinary Services Directorate (VSD)
- Animal Production Directorate (APD)
- Women in Food and Agricultural Development (WIFAD)

The WAATP will be implemented by the Ministry of Food and Agriculture (MoFA), where the Project Coordinating Unit (PCU) will be hosted. The PCU will manage day-to-day implementation of the Project. The staff will ensure the following PCU roles: Project coordinator, procurement specialist and Assistant, Environmental and social safeguards specialist, financial management specialist and Accountants, Monitoring and Evaluation specialist, private sector specialist, two technical experts (crops and Livestock) and a communication specialist.

Ministry of Environment, Science, Technology and Innovation

The Ministry of Environment, Science, Technology and Innovation (MESTI) 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 EPA and the CSIR are under this ministry.

The Environmental Protection Agency (EPA)

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.

Council for Scientific and Industrial Research

The Council for Scientific and Industrial Research (CSIR) is mandated to pursue, among others, the implementation of government policies on scientific research and development, coordinate R&D activities in the CSIR and other scientific & technological institutions nationwide and assist the government in the formulation of scientific and technological policies for national development. The Council was established in its present form by NLC Decree 293 of 10th October, 1968 and re-established by CSIR Act 521 of 26th November, 1996. There are currently 13 research institutes making up the CSIR. The Crop Research Institute (CRI), Savannah Agricultural Research Institute (SARI) and the Food Research Institute (FRI) will be involved in the WAATP activities.

Ministry of Local Government and Rural development

The Ministry of Local Government and Rural Development exists to promote the establishment and development of a vibrant and well-resourced decentralised system of local government for the people of Ghana to ensure good governance and balanced rural based development.

Metropolitan /Municipal/District Assemblies (MMDAs)

The District/Municipal/Metropolitan Assemblies are the planning authorities, charged with the overall development of the district/municipal/metropolis. A key feature of the Assembly System is the involvement of communities or zones or whole villages who elect their representatives (Assemblymen)

to the Assembly. The structure of the Assembly comprises Unit Committees which are usually formed at the community levels, and the Urban/Town/Area Councils.

Public Institutions involved in Land Administration
The institutions include:

- Land Commission
- Department of Town and Country Planning
- Office of the Administrator of Stool Lands
- Ministry of Lands and Natural Resources

3.5 World Bank Safeguard Policies

The World Bank is guided by policies/ procedures to ensure the safe development of projects it is funding. The triggered existing WB safeguards policies are shown in **Table 3.1** and a summary of their core requirements are also provided.

Table 3.1 Summary of World Bank Safeguard Policies

Policy	Summary of core requirements	Triggered
OP 4.01 - Environmental Assessment	Screen early for potential impacts and select appropriate instrument to assess, minimise and mitigate potentially adverse impacts	Yes
OP 4.04 – Natural Habitats	Do not finance projects that degrade or convert critical habitats. Support projects that affect non- critical habitats only if no alternatives are available and if acceptable mitigation measures are in place	No
OP 4.09- Pest Management	Support integrated approaches to pest management. Identify pesticides that may be financed under the project and develop appropriate pest management plan to address risks	Yes
OP 4.10 Indigenous peoples	Screen to determine presence of indigenous peoples in project area. Policy triggered whether potential impacts are positive or negative. Design mitigation measures and benefits that reflect indigenous people's cultural preferences.	No
OP 4.11- Physical cultural resources	Investigate and inventory cultural resources potentially affected. Include mitigation measures when there are adverse impacts on physical cultural resources	No
OP 4.12- Involuntary Resettlement	Assist displaced persons in their effort to improve or at least restore their standards of living. Avoid resettlement where feasible or minimise. Displaced persons should share in project profits	Yes
OP 4.36- Forests	Support sustainable and conservation oriented forestry. Do not finance projects that involve significant conversion or degradation of critical forest areas	No
OP 4.37- Safety of dams	For large dams, technical review and periodic safety inspections by independent dam safety professionals	No

OP 7.50- Projects on international waterways	Ascertain whether riparian agreements are in place, and ensure that riparian states are informed of and do not object to project interventions.	No
OP 7.60- Projects in disputed areas	Ensure that claimants to disputed areas have no objection to proposed project.	No

World Bank New Environmental and Social Framework

On August 4, 2016, the World Bank's Board of Executive Directors approved a new Environmental and Social Framework (ESF) to help protect people and the environment in the investment projects it finances. The ESF is made up of the World Bank's vision for sustainable development, the World Bank's Environmental and Social Policy for Investment Project Financing, and ten Environmental and Social Standards (ESS). The World Bank is now implementing an intensive preparation and training period for the transition to this new framework. The Bank's current safeguards will run in parallel to the ESF for about seven years to govern projects approved before the effectiveness date of the ESF.

The ten ESS include:

ESS1: Assessment and Management of Environmental and Social Risks and Impacts sets out the Borrower's responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through IPF, in order to achieve environmental and social outcomes consistent with the Environmental and Social Standards (ESSs).

ESS2: Labor and Working Conditions recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions.

ESS3: Resource Efficiency and Pollution Prevention and Management recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels. This ESS sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life-cycle.

ESS4: Community Health and Safety addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable.

ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement - involuntary resettlement should be avoided. Where involuntary resettlement is unavoidable, it will be minimized and appropriate measures to mitigate adverse impacts on displaced persons (and on host communities receiving displaced persons) will be carefully planned and implemented.

ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development and it recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support. ESS6 also addresses sustainable management of primary production and harvesting of living natural resources, and recognizes the need to consider the livelihood of project-affected parties, including Indigenous Peoples, whose access to, or use of, biodiversity or living natural resources may be affected by a project.

ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities ensures that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities. ESS7 is also meant to avoid adverse impacts of projects on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts.

ESS8: Cultural Heritage recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. ESS8 sets out measures designed to protect cultural heritage throughout the project life-cycle.

ESS9: Financial Intermediaries (FIs) recognizes that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction. FIs are required to monitor and manage the environmental and social risks and impacts of their portfolio and FI subprojects, and monitor portfolio risk, as appropriate to the nature of intermediated financing. The way in which the FI will manage its portfolio will take various forms, depending on a number of considerations, including the capacity of the FI and the nature and scope of the funding to be provided by the FI.

ESS10: Stakeholder Engagement and Information Disclosure recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

3.6 World Bank Safeguard Policies and Ghanaian Environmental Assessment Policies

An assessment is presented which is based on a pilot study conducted by the World Bank on the use of Ghanaian systems to address safeguard issues under the Ghana Energy Development and Access Project (GEDAP), and published in 2006.

It was intended for GEDAP to be governed by the new operational policy (OP 4.00) on “Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects.” In accordance with OP 4.00, staff from the World Bank, in collaboration with relevant staff from affected institutions including Ghana Environmental Protection Agency (EPA), carried out an equivalence analysis

and acceptability assessment of applicable Ghanaian environmental systems. The work was done in partnership with the African Development Bank (AfDB) in order to facilitate use of country systems in Ghana by both banks and to progress toward harmonizing their respective safeguards requirements.

The assessment confirmed that, with a modest number of gap-filling measures, Ghanaian Environmental Assessment systems can be used in preparing and implementing the project. However, for three areas (a) OP/BP 4.04, *Natural Habitats*, (b) OP/BP 4.12, *Involuntary Resettlement*, and (c) OP 4.37 *Safety of Dams* the World Bank operational policies should apply.

If policy discrepancy exists, the World Bank policies will override that of the Government of Ghana (GoG) policies and regulations. The World Bank safeguard policies will be binding when implementing WB funded projects, mainly.

4.0 BRIEF GHANA BASELINE CONDITIONS

4.1 Physical Environment

4.1.1 Geopolitical Setting

Ghana 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. Ghana has ten (10no.) administrative regions and 216 administrative districts.

4.1.2 Climatic Conditions

The climate of Ghana is influenced by the movement of two air masses; Northeast Trade Winds and the Southwest Monsoons. These air masses determine the rainfall pattern over the region. The northeast trade winds are dry, cool and dust-laden and are known as the harmattan and usually affect Ghana from November to February. The southwest monsoon winds are moisture laden winds which tend to bring rains between March-July/September-October for the southern sector (i.e. from the coast to Brong Ahafo) and May-September for the northern sector (i.e. Upper East/West and Northern Regions). Average rainfall over the country is about 1,260 mm/ year (Forestry Commission, 2017a).

Wet/Moist Evergreen Climatic Zone

The moist evergreen climatic zone is also the High Rain Forest zone and is found in the south-western part of the country. The annual rainfall of this zone is between 1,700 and 2,200 mm and there are two rainy seasons. The soils are heavily leached and fertility is relatively low. The major crops grown are oil palm, rubber, coconut, rice, bananas, plantains and cocoyam. The Western Region largely falls within this climatic zone (Forestry Commission, 2017a).

The wet semi- equatorial climatic zone

The Ashanti and Eastern regions and part of the Volta, Central and Brong Ahafo regions fall within this climatic zone and is characterized by two rainfall maxima. The mean annual rainfall lies between 1200 mm and 2000 mm. The first rainy season is from May to June with the heaviest rains in June while the second season starts in September and ends in October. The highest mean monthly temperature of about 30 ^{o}C occurs between March and April, and the lowest of about 26 ^{o}C in August. The average monthly relative humidity is highest (75 %- 80 %) during the two rainy seasons and lowest (70 %- 80 %) during the rest of the year (Forestry Commission, 2017a).

The Dry equatorial zone

The southern parts of the Volta and Central and Greater Accra Regions are within this climatic region, which also has two rainfall maxima but the dry seasons are more marked and the mean annual rainfall is considerably less, ranging from 700 mm to 900 mm. This region is the driest in Ghana. The temperatures are similar to the wet semi- equatorial reported above. Relative humidity is highest in the rainy season,

but the highest average monthly relative humidity in this climatic zone varies within a relatively limited range of 60 % at the lowest to a maximum of 75 % (Forestry Commission, 2017a).

The tropical continental or savannah zone

The tropical continental zone or savannah zone has a single rainy season from May to October followed by a prolonged dry season. The mean annual rainfall is about 1000 mm to 1150 mm. The mean monthly temperatures vary from about 36 ^{o}C in March to about 27 ^{o}C in August. Relative humidity is high during the rainy season (70 % to 90 %) but may fall to as low as 20 % during the dry season (Forestry Commission, 2017a).

4.1.3 Relief and Topography

The country is characterized by fairly low relief with few areas of moderate elevation in the north and east. The relief map of Ghana is shown in **Figure 4.1**. 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 (Kwahu West/East/South and Atiwa districts are within this area), 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 (Akuapim North and South districts are within this range) registering the highest point (Mt. Afadjato, about 885 m) in the country.

The topography of the country is mainly undulating with most slopes less than 5% and many not exceeding 1%. The topography of the high rainforest is mainly strongly rolling. The uplifted edges of the Voltarian Basin give rise to narrow plateaux between 300 to 600 m high. Despite the general undulating nature of the terrain, about 70 % suffer from moderate to severe soil erosion (Forestry Commission, 2017b).

4.1.4 Water Resources and Drainage

There are three main surface water systems draining the country comprising the Volta river system (70 % of the land area of Ghana)-comprises of Black/White Volta, Oti river, Afram, river, Volta Lake/Upper Volta and Lower Volta; Southwestern river system (22 % of the land area of Ghana)-comprises of Bia, Tano, Ankobra and Pra (also made up of Birim and Offin rivers) river basins; and coastal river systems (8 % of the land area of Ghana)-comprises of Densu, Ayensu, Ochi-Amisa, Ochi-Nakwa, Kakum and Odaw river basins. The drainage map of Ghana is shown in **Figure 4.2.** The administration regions and districts within the respective river basins are listed in **Table 4.1.**

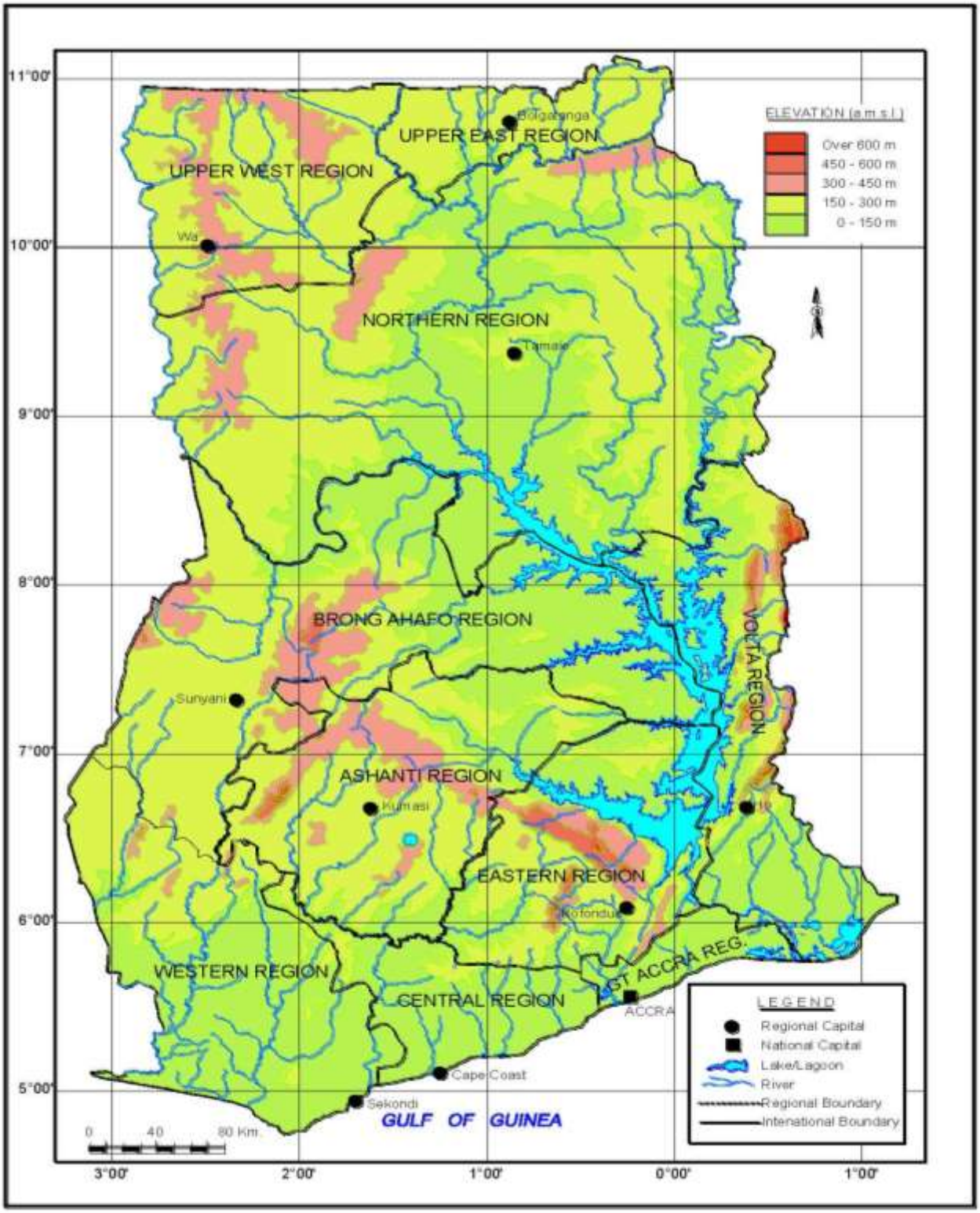

Figure 4.1 Relief Map of Ghana (Source: WRC, 2010)

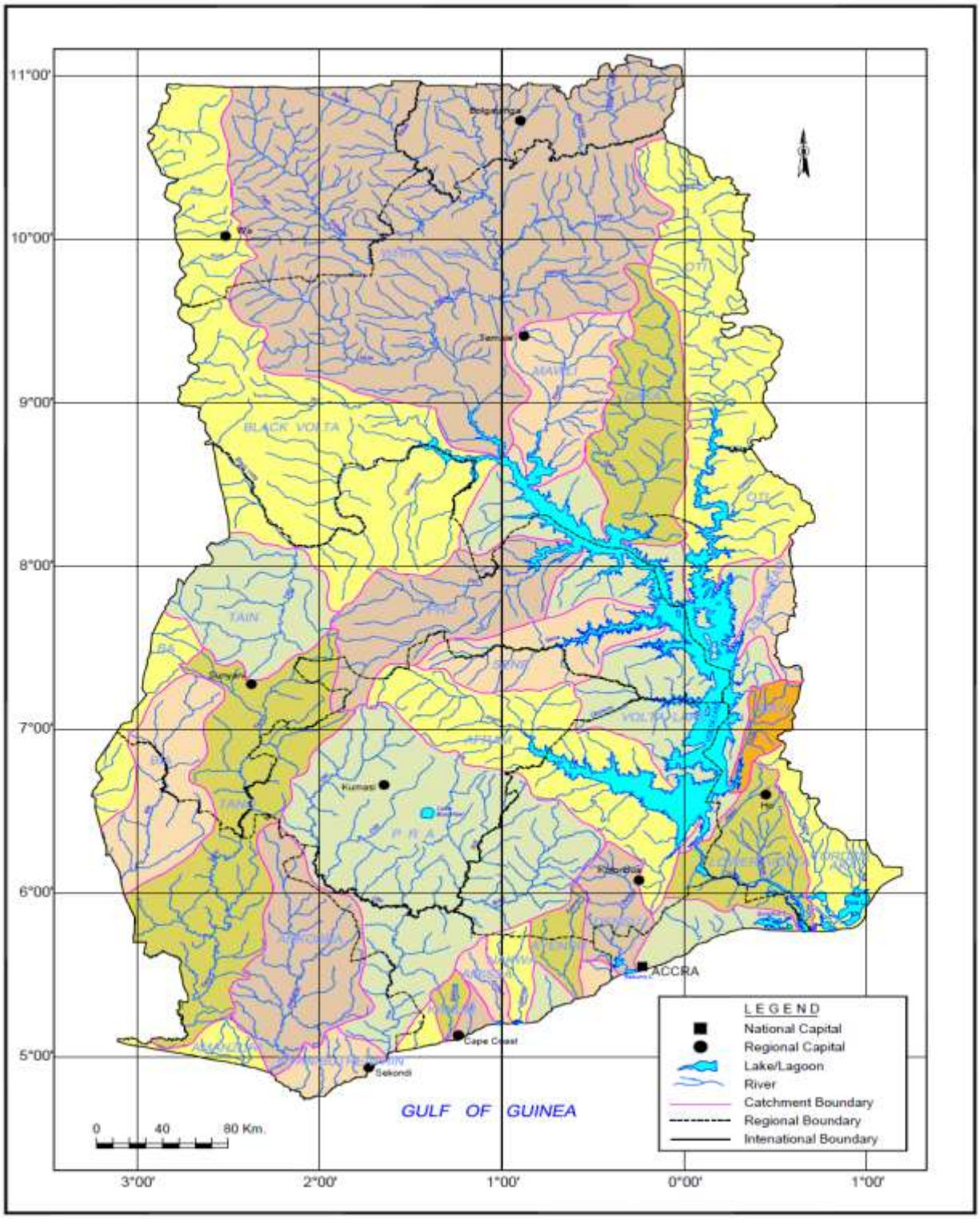

Figure 4.2 Drainage Map of Ghana (Source: WRC, 2010)

Table 4.1 Administrative regions and districts drained by major river basins

River System	River basin	Administrative regions		Administrative districts
		Region	% of area drained	
Volta	White Volta	Northern	50	Sawla Tuna Kalba; West Goja; West Mamprusi; East Mamprusi; Bunkpuru Yunyo; Karaga; Gushegu; Yendi Municipal; Tamale Metropolitan; Tolon Kumbungu; Savelugu Nanton; Central Gonja
		Upper West	70	Lambussie Karn; Sissala West; Sissala East; Wa East; Wa Municipal; Nadowli; Jirapa; Wa West.
		Upper East	100	Kassena Nankana East; Kassena Nankana West; Bongo; Talensi Nabdam; Garu Tempane; Bawku West; Bawku Municipal; Bolgatanga Municipal
	Black Volta	Upper West	22	Sissala West; Lambussie Karn; Lawra; Jirapa; Nadowli; Wa Municipal; Wa West; Wa East
		Northern	48	Sawla Una Kalba; West Gonja; Bole; Krachi West
		Brong Ahafo	30	Tain; Jaman North; Jaman South; Berekum Municipal; Sunyani West; Sunyani Municipal; Wenchi; Techiman Municipal; Kintampo Municipal; Kintampo South; Pru
	Lower Volta	Volta	71	South Dayi; Ho Municipal; Adaklu Anyigbe; North Tongu; South Tongu
		Eastern	13	Asuogyamann; Lower Manya Krobo; Yilo Krobo; Akwapim North
		Greater Accra	16	Dangbe East, Dangbe West
South western	Bia	Brong Ahafo	44	Asunafo South; Asunafo North; Asutifi; Dormaa Municipal
		Western	56	Bia; Juabeso; Sefwi Wiawso; Aowin Suaman; Sefwi Akontonbra
	Tano	Brong Ahafo	35	Berekum Municipal; Dormaa East; Sunyani West; Sunyani Municipal; Tano North; Tano South; Techiman Municipal; Asunafo South
		Western	50	Bibiani Anhwiaso; Sefwi Wiawso; Juabeso; Sefwi Akintonbra; Ellembele; Aowin Suaman; Jomoro
		Ashanti	15	Offinso North; Ahafo Ano South; Ahafo ANo North; Atwima Mponua
	Pra	Ashanti	55	Ahafo Ano; Offinso Municipal; Afigya Kwabre; Sekyere South; Atwima Nwabiagya; Mampong Municipal; Asante North; Ejisu Juaben; Asante AKim North; Bosome Freho; Bosomtwe; Kwabre; Kumasi Metropolitan; Bekwai Municipal; Adansi North; Adansi South; Obuasi Municipal; Amansie Central; Amansie West; Atwima Mponua
		Central	15	Assin North Municipal; Assin South; Lower Denkyira; Mpohor Wassa East; Upper Denkyira East; Upper Denkyira West; Askuma Odoben Brakwa
		Eastern	23	Akim South; Birim Central Municipal; Akyemansa; Kwabibirem; Suhum Kraboa Coaltar; east Akim Municipal; Fanteakwa; Atiwa; Kwahu West Municipal; Birim North; Kwahu East; Kwabre South
		Western	7	Mpohor Wassa East; Shama; Tarkwa Nsuaem; Bibiani Anhwiaso Bekwai

River System	River basin	Administrative regions		Administrative districts
		Region	% of area drained	
	Ankobra	Ashanti	1	Atwima Mponua
		Western	92	Nzema East; Ellembele, Tarkwa/Nsuaem; Pretea Huni Valley; Mpohor Wassa East;; Wassa Amenfie East; Wassa Amenfie West; Jomoro; Bibiani Anhwiaso
		Central	7	Twifo Heman Lower Denkyira; Upper Denkyira West; Upper Denkyira East
Coastal	Densu	Eastern	71	East Akim; Kwaebibirem; New Juaben Municipal; Suhum Kraboa Coaltar; Akwapim North; Akwapim South; West Akim Municipal
		Greater Accra	23	Ga West; Ga South; Ga East; Accra Metropolitan
		Central	6	Awutu Senya
	Ayensu	Central	54	Agona East Municipal; Agona West; Awutu Senya;
		Eastern	46	Suhum Kroboa Coaltar; West Akim Municipal; Birim Central Municipal

(Source: WRC (2010) National Baseline Studies and Institutional analyses towards the development of the national IWRM Plan)

4.1.4.1 Major Surface Water Usage

Generally, the enormous natural resources within the river basins are currently being exploited for national development. The major consumptive water resource uses in the country are for irrigation and domestic water supply. Hydropower generations on the Volta (e.g. upstream at Bui, midstream at Akosombo and Kpong) have had a major impact on the socio-economic development of the country.

Some relevant water bodies relied upon for treatment and supply for domestic and industrial usage include: Black Volta, White Volta, Lower Volta, Pra, Tano, Ankobra, Offin, Densu, Ayensu, Kakum etc.

Most of the river basins are characterized by accelerating land degradation and there is ample evidence of localized pollution from urban, industrial including mining activities especially in the coastal and south western rivers. The Ankobra and the Pra Rivers have suffered from serious mining pollution (WRC, 2010).

4.1.5 Soils

The soils of Ghana are highly weathered with predominantly light textured surface horizons in which sandy loams and loams are the common textural classes. The lower soil horizons have relatively heavier textures varying from coarse sandy clay loams/sandy loams to clays. Heavier textured soils are normally abundant in the valley bottoms.

The soil classification map of Ghana is shown in **Figure 4.3.** The local classification system of soil in Ghana is based on characteristics that are the result of the major climatic differences that in turn have given rise to two major distinct vegetation belts, namely, Forest and Savannah.

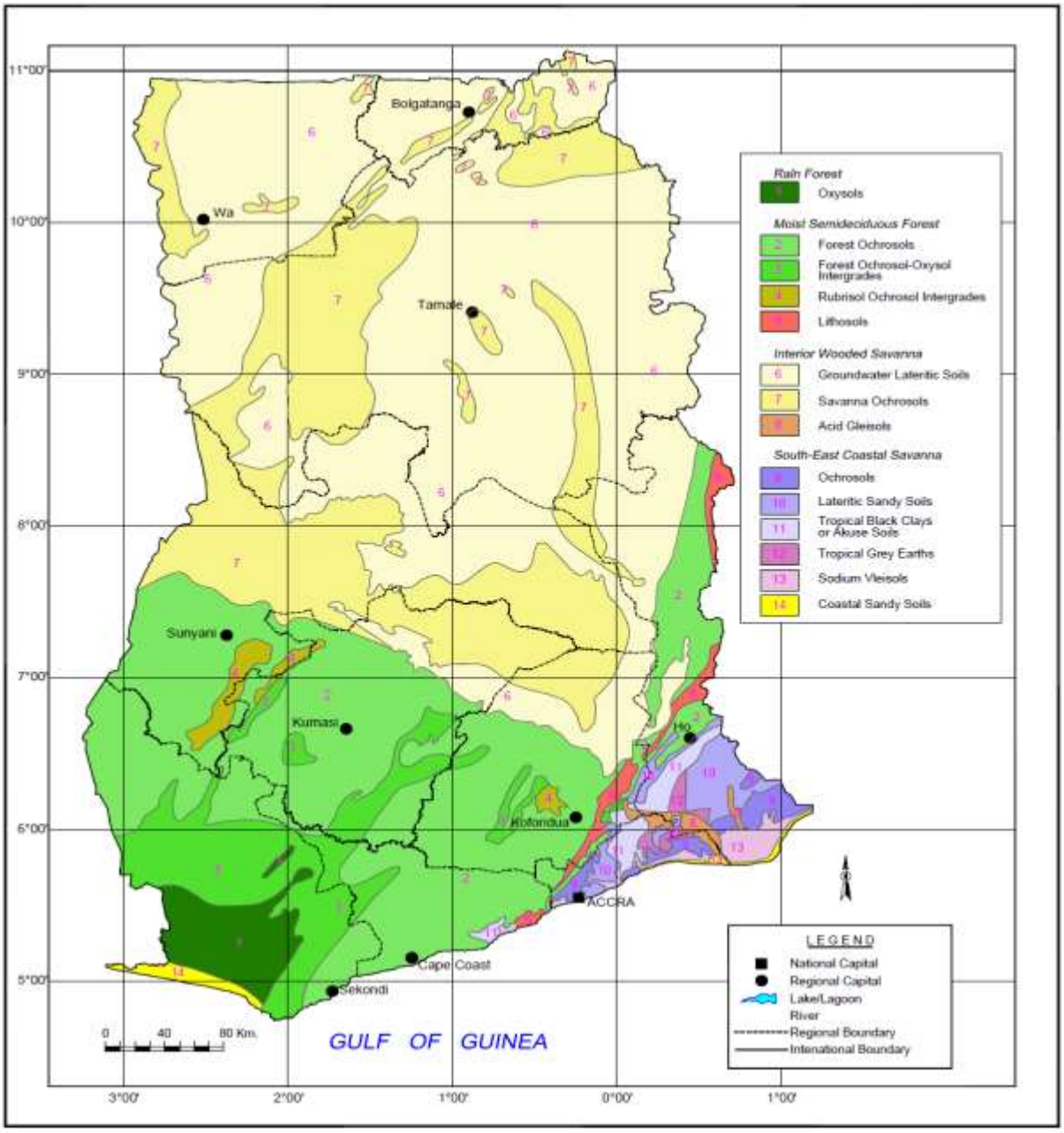

Figure 4.3 Soil Map of Ghana (WRC, 2010)

4.2 Biological Environment

4.2.1 Vegetation/Ecological zones

The natural vegetation is determined by the different climatic conditions and influenced by different soil types and altitudinal differences. A closer look at Ghana's vegetation cover reveals a pronounced environmental gradient from the evergreen rainforest of the western coasts through to the dry semi-deciduous forest of the forest-savannah transition to the savannah environment of the northern regions. This ecological difference of Ghana has been well classified by Hall and Swaine (1981). The classification is based on the gradual change in forest composition, from the south west, where the rainfall is highest and the forests are evergreen, towards the savannah in the east and north, where the forest is dry and deciduous. The vegetation/ecological map of Ghana is shown in **Figure 4.4.**

4.2.2 The Fauna of Terrestrial System

The fauna of the terrestrial ecosystem, though relatively impoverished, comprise a diverse array of species including several of conservation concern. Current records show that there could be as many as 221 species of amphibians and reptiles, 724 species of birds, 225 mammalian species (with 93 recorded to inhabit the savanna ecological zone). Threatened species recorded in the country include four species of marine turtles and three species of crocodiles. Bird species of conservation concern include seven threatened species, including four species endemic to the Upper Guinea forest block and seven near-threatened species, (Ntiamoa-Baidu *et al*, 2001).

4.2.3 Fresh Water and other Aquatic Ecosystems in Ghana

Ghana's fresh water fish fauna includes 28 families, 73 genera and 157 species. About 121 species have been recorded from the Volta system within Ghana, which drains more than a third of the entire country. About nine species viz. *Barbus subinensis* (cyprinidae), *Irvinea voltae* (Schibeidae), *Chrysichthys walkeri* (Clarioteidae), *Synodontis arnoulti, S. macrophthalmus, S. velifer* (Mochokidae), *Limbochromis robertsi, Steatocranus irvinea* (Cichilidae and Aethiomastac embeluspraensis (Mastacembelidae) are endemic to freshwater system of Ghana (Dankwa *et al*, 1999).

Economically, 81 species are of food importance. Species of cultural importance include *Heterotis niloticus* (Osteoglossidae) *Clarias Gariepinus, Heterobranchus longifilis* (Claridae) *Chrysichthys nigrodigitatus* (Clariotiedae), *Oreochromis niloticus* (Chichlidae) and *Lates nilo/ticus* (Centropomidae). Some species need to be protected because of their restricted distribution or their habitat degradation or destruction (Dankwa *et al*, 1999).

Other freshwater ecosystems include the major rivers such as the White Volta, Black Volta, Lower Volta and Oti. Others are Pra, Tano, Ankobra, Bia and Todzie-Aka. Also included are other impoundments serving as drinking water sources and/or for irrigation. It is estimated conservatively that about 124 fish species from 62 families inhabit the major rivers (Dankwa *et al*, 1999).

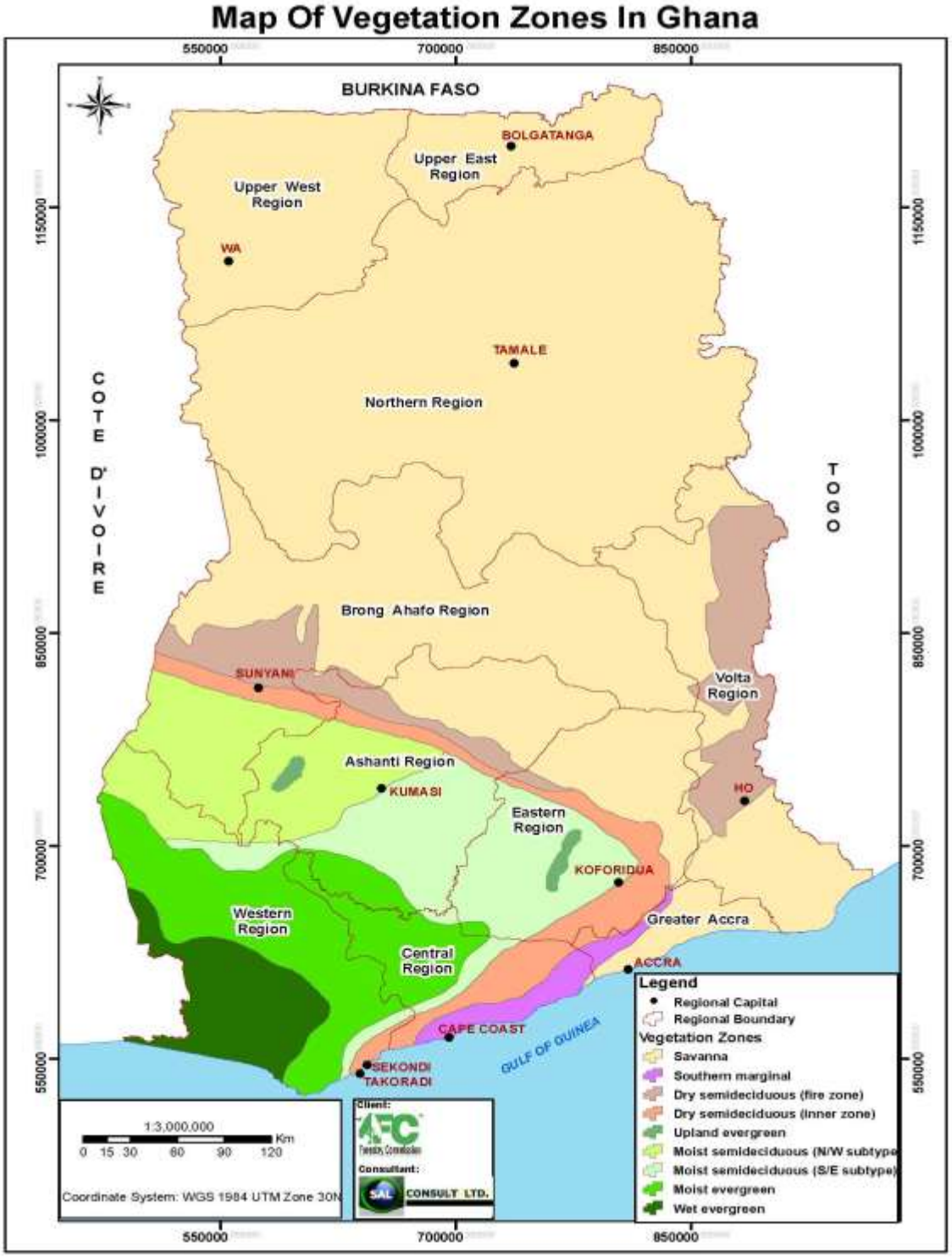

Figure 4.4 **Vegetation/Ecological map of Ghana (Source: Forestry Commission, 2017a)**

4.3 Social Environment

4.3.1 Land Ownership and Tenure System

Land ownership

Land ownership and tenure in Ghana is governed by a system of common law and customary land law, from which have emerged the following categories of landholdings:

- Customary owned;
- State owned; and
- Customary owned but State managed land (also known as vested land).

Customary Ownership

Customary ownership occurs where the right to use or to dispose of use-rights over land is governed by the customary laws of the land owning community, based purely on recognition by the community of the legitimacy of the holding. Rules governing the acquisition and transmission of these rights, which vary from community to community depending on social structures and customary practices, are normally not documented but are generally understood by community members.

The Allodial title, equivalent to common law freehold rights, forms the basis of all land rights in Ghana. Allodial rights are vested either in a stool, a clan, a family, an earth priest or a private individual person. Lesser interests, such as tenancies, licenses and pledges, emanate from the Allodial title.

Customary lands are managed by a custodian (a chief or a head of clan or family) together with a council of principal elders appointed in accordance with the customary law of the land owning community. They are accountable to the members of the land owning community for their stewardship. All grants of land rights by the custodian require the concurrence of at least two of the principal elders for the grant to be valid.

State Land

State land includes tracts specifically acquired by government under an appropriate enactment using the state powers of eminent domain. Currently the principal acquiring legislation is the State Lands Act of 1962, Act 125, for public purposes or in the public interest. Under such ownership, Allodial rights become vested in government who can then dispose of the land by way of leases, certificate of allocations, and licenses to relevant beneficiary state institutions as well as private individuals and organizations. The boundaries of these land parcels are cadastral surveyed and are scattered throughout the country.

Vested Land

Vested land is owned by a chief, but managed by the State on behalf of the land owning stool or skin. Under such ownership legal rights to sell, lease, manage, or collect rent is taken away from the customary landowners by application of specific laws on that land and vested in the State. Landowners retain equitable interest in the land (i.e., the right to enjoy the benefits from the land). This category of

land is managed in the same way as State land. Unlike State land however, the boundaries are not cadastral surveyed and they are usually larger, covering wide areas.

4.3.2 Population and Population Density

The 2010 population census by the Ghana Statistical Service (GSS) for the regions is given in the **Table 4.2**. The population density by region is provided in **Table 4.3**.

Table 4.2 2010 Population Figures (Source: Ghana Statistical Service, 2011)

Population by Region and Sex								
Both Sexes		**Male**	**Female**	**Region Share**			**Male**	**Female**
ALL REGIONS	**24,658,823**	**12,024,845**	**12,633,978**	**100.0**	**100.0**	**100.0**	**48.8**	**51.2**
WESTERN	2,376,021	1,187,774	1,188,247	9.6	9.9	9.4	50.0	50.0
CENTRAL	2,201,863	1,050,112	1,151,751	8.9	8.7	9.1	47.7	52.3
GREATER ACCRA	4,010,054	1,938,225	2,071,829	16.3	16.1	16.4	48.3	51.7
VOLTA	2,118,252	1,019,398	1,098,854	8.6	8.5	8.7	48.1	51.9
EASTERN	2,633,154	1,290,539	1,342,615	10.7	10.7	10.6	49.0	51.0
ASHANTI	4,780,380	2,316,052	2,464,328	19.4	19.3	19.5	48.4	51.6
BRONG AHAFO	2,310,983	1,145,271	1,165,712	9.4	9.5	9.2	49.6	50.4
NORTHERN	2,479,461	1,229,887	1,249,574	10.1	10.2	9.9	49.6	50.4
UPPER EAST	1,046,545	506,405	540,140	4.2	4.2	4.3	48.4	51.6
UPPER WEST	702,110	341,182	360,928	2.8	2.8	2.9	48.6	51.4

Ghana's population exceeded 24 million in 2010, an increase of 28 % from 2000. The average annual growth rate is about 2.4 % and population is projected to reach 31 million by 2025. Over the past ten years, population density increased from 79 to 102 persons per km². Urban population is about 40 %, growing by 4.4 %, and expected to reach almost 65 % by 2020. Population increase and also urbanization increase will exert demand on natural resources by expansion of agricultural areas and increasing demand for construction wood and for charcoal, especially in urban settings.

Table 4.3 Population density by region, 1984 – 2010

REGION	**AREA (SQ KM)**	**2010**	**2000**	**1984**
GHANA	**238,533**	**103**	**79**	**52**
WESTERN	23,921	99	80	48
CENTRAL	9,826	224	162	116
GREATER ACCRA	3,245	1,236	895	441
VOLTA	20,570	103	80	59
EASTERN	19,323	136	109	87
ASHANTI	24,389	196	148	86
BRONG AHAFO	39,557	58	46	31
NORTHERN	70,384	35	26	17

UPPER EAST	8,842	118	104	87
UPPER WEST	18,476	38	31	24

Source: Ghana Statistical Service, 2011

4.3.3 Social Administration and Structure

Traditional Authorities

The chieftaincy institution is the most celebrated traditional institution in Ghana. The chief as traditional political leader of his or her community is variously called among different ethnic groups in Ghana. The chief for instance is called Nana among the Akans, Nii among the Ga people, Torbge among the Ewes, 'Naa' among the Dagaaba, 'Naaba' among the Frafra, 'Naab' among the Mamprusis, Naa among the Dagombas and Wura among the Gonjas.

The chieftaincy institution is a predominantly male dominated institution. Most chiefs are males but in rare instances there are few female chiefs. The female chief, a rather rare type of office holder in traditional circles, may either be the chief for the community in some cases or in other cases, co-exists with a male chief.

As a chief, power in the exercise of traditional authority is basically derived through "ascription" but the community must sanction inheritance and enthronement of the skin or stool. For instance, ascription to the skin or stool requires that the paramount chief in collaboration with the Custodian of the Land and Spiritual Leader preside over the succession and "enthronement" processes. This is a prerequisite and basis for the legal and social approval of the chief's authority to rule in the community. Irrespective of whether a chief is male or female, they generally hold equal power and authority except in cases where a female chief co-exists in the community with a male chief. In such instances, the female chief derives her authority from the community chief who often installs and enthrones her in collaboration with other traditional office holders.

Language and ethnicity

Ethnicity refers to the ethnic group that a person belongs to. Based on the major ethnic groups in Ghana as officially provided by the Bureau of Ghana Languages the PHC reported ethnic affiliation as Akan being the largest ethnic group in the country (47.3 %), followed by Mole Dagbani (16.6 %), Ewe (13.9 %), Ga-Dangme (7.4 %), Gurma (5.7 %) and Guan (3.7 %).

According to the 2010 PHC, most of the population of Central (81.7 %), Western (78.2 %), Ashanti (74.2 %), Brong Ahafo (58.9 %) and Eastern (51.1 %) regions were Akan. In addition, the highest proportions of the population of Greater Accra were Akan (39.7 %) and Ga-Dangme (27.4 %). Seventy four percent of the population of Volta was Ewe (73.8 %), and for the Northern, Upper East and Upper West the predominant group was the Mole-Dagbani.

Nearly 18 percent of the population of Eastern region was Ga-Dangme. This is because the group astride the Eastern region and the Greater Accra regions. Secondly, one-fifth of the population of Greater Accra was Ewe. The Guan does not comprise the majority in any region but could be found in five out of the

ten regions: (Northern (8.6 %), Volta (8.1 %), Eastern (5.3 %), Central (5.3 %) and Brong Ahafo (4.1 %)). This is a group considered to be one of the original settlers of present Ghana (Dickson, 1969).

Religion

Religion can be defined as an organized collection of beliefs, cultural systems and world views that relate humanity to an order of existence. The 2010 population and housing census indicate that about Seventy-one percent of the population (71.2 %) are Christians (Catholic, Protestant, Pentecostal/Charismatic and other Christian), followed by Islam (17.6 %) and Traditionalists (5.2 %). About five percent (5.3 %) stated that they had no affiliation to any religion (Ghana Statistical Service, 2011)

4.3.4 Employment

According to the report from the 2010 population and housing census, the proportions of the population aged 15 years and older who were employed in 2010 were nearly 42.0 percent. Of the population employed in 2010, over 90 percent of those who were economically active was employed and the proportions were 95.2 percent for males and 94.2 females.

The 2010 census results show that 57.0 percent of the workforce was in Ashanti, Greater Accra, Northern and Eastern Regions, a reflection of the distribution of population in the country. The shares of the workforce in the Upper East and Upper West Regions were 4.3 percent and 2.7 percent in 2010, similar to their proportions in the total population.

In 2010, 75.3 percent of the employed population in the Volta Region was self-employed, the highest in the country. This was followed by Eastern Region with 72.4 percent. The two regions which reported the lowest percentages of self-employed populations were Greater Accra region (55.7 %) and Upper West (55.5 %) (Ghana Statistical Service, 2011).

4.3.5 Poverty Level

About a quarter of Ghanaians are poor whilst under a tenth of the population are in extreme poverty (GSS, GLSS5). Although the level of extreme poverty is relatively low, it is concentrated in Rural Savannah, with more than a quarter of the people being extremely poor. Overall, the dynamics of poverty in Ghana over the 7-year period indicate that poverty is still very much a rural phenomenon, thus reducing rural poverty is a panacea to Ghana's poverty, if poverty reduction is to achieve the desired levels for Ghana as a lower middle-income country.

According to the 2010 PHC projections, more than 2.2 million Ghanaians (based on 2010 PHC cannot afford to feed themselves with 2,900 calories per adult equivalent of food per day, even if they were to spend all their expenditures on food. Although the absolute number living in extreme poverty has reduced over time, it is still quite high given the fact that Ghana is considered to be a lower middle - income country.

There is a lot of variability in poverty incidence by region. Whilst half of the ten regions (Greater Accra, Western, Central, Eastern, and Ashanti) had their rates of poverty incidence lower than the national

average of 24.2 percent, the remaining half had rates higher than the national average; Greater Accra is the least poor region and the Upper West the poorest overall. Though most regions show a reduction in poverty incidence since 2005/06, the pattern of poverty by region has not changed.

4.3.6 Women in Agriculture

According to a policy brief on women and smallholder agriculture in Ghana prepared by SEND Ghana in 2014 (Policy Brief No. 4/October2014), Women are the key actors in Ghana's agriculture, constituting over half the agricultural labour force and producing 70 per cent of the country's food stock. Women constitute 95 per cent of those involved in agro- processing and 85 per cent of those in food distribution. Their contribution to agricultural work varies even more widely depending on the specific crop under cultivation, type of involvement and activity. Besides agriculture-related activities, smallholder women farmers are heavily engaged in domestic and reproductive tasks, which are crucial to the maintenance of households, and communities. These tasks are regarded as an extension of household duties and hence, remain hidden economically.

Due to the specific role of smallholder women farmers in food production, many of them are repositories of knowledge on cultivation, processing, and preservation of nutritious and locally adapted crop varieties. It is estimated that if women farmers had the same access to productive resources as their men counterpart, they could increase yields on their farms by 20 to 30 percent, and this could raise total agricultural output in Ghana by 4 percent, which in turn could reduce hunger by 17 percent. In the long run, this would improve family nutrition, food security, maternal and child health, promote environmental management, minimize poverty levels and reduce conflicts. To maximize the impact of agricultural intervention and programmes, it is important to recognize the differing roles, needs and priorities of men and women. Such recognition is crucial to appreciating the different inequalities they face and to ensure that these are given due consideration in agriculture-related programming, policy formulation and implementation.

5.0 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND SIGNIFICANCE

5.1 WAATP and Associated Activities

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.

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

Table 5.1 Project associated activities

Potential WAATP Areas	Associated Project Activities
Renovation/Rehabilitation Works and construction of new facilities	Chiselling and demolition works and removal of dilapidated structures/ buildings Procurement and transport of construction materials to site Site clearing Construction and installation activities and work-camps Excavation works Concrete works Provision and use of raw water Movement of vehicles/ equipment to and at site Construction of access roads Waste generation and disposal of solid wastes/construction wastes and hazardous materials Human wastes generation and disposal Acquisition of land for new projects
Field Demonstration Plots, Farmer field schools, Research activities	Acquisition of land or land occupation Implementation of compensation arrangements Site clearing Pesticide handling and use Waste generation and disposal Construction activities

5.2 Potential positive impacts of project activities

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

- Improved soil fertility
- Increased farm incomes from crop output
- Food Security
    - Improving food storage facilities/warehouses
    - Improving agro processing facilities

- Poverty Alleviation
- Raise Rural Income
- Improved nutrition
- Employment creation for community members and the youth in general
    - Planting for food and jobs
- Empowerment of farmers
    - Access to mechanization tools
    - Access to improved extension services
    - Access to improved seeds and planting materials
    - Access to greenhouse technology
    - Knowledge of best agricultural practices and climate smart agriculture
- Enhance research activities and strengthen capacity of researchers, MOFA staff and other stakeholders
- Improve partnership development among research institutions and stakeholders

5.3 Determination of environmental and social significance of adverse impacts

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.

5.3.1 Categories of impact significance and potential adverse impacts

A 'negligible 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.

The above classification used in the tables is largely subjective, and may be overruled by new site specific issues or information and detailed project activities not captured in this framework. 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 5.2 Some project activities and associated potential adverse environmental/social impact issues

No	Projects and Associated Activities	Potential Environmental and Social Impact Issues and concerns	Environmental Significance
1.	Rehabilitation and Renovation Activities	Air pollution	Moderate
		Water pollution	Moderate
		Soil erosion	Minor
		Noise and vibration	Moderate
		Waste generation and disposal/sanitation	Major
		Disposal of hazardous materials such as asbestos	
		Fuel/electricity consumption	Moderate
		Raw water usage	Minor- moderate
		Destruction of flora and fauna habitat	Minor
		Community access road usage	Moderate
		Occupational health and safety issues	Major
		Public safety and traffic	Major
		Resettlement related issues	Minor
		Construction phase employment	Moderate
		Impact on cultural heritage sites	Minor
		Maintenance issues and waste disposal during operational phase	Moderate
2	Field demonstration plots and farmers field schools	Land take	Moderate - Major
		Resettlement/compensation related issues	Moderate
		Loss of livelihood	Minor- moderate
		Impact on cultural heritage sites	Minor
		Health and safety concerns of farmers	Moderate
		Destruction of flora and fauna habitat	Minor
		Pesticide usage and waste disposal	Moderate
		Water pollution from agrochemical use	Minor-moderate
		Soil erosion	Minor
		Air pollution	Minor
		Sanitation issues	Moderate
3	New developments and services	Air pollution	Moderate
		Noise nuisance	Moderate
		Water pollution	Moderate
		Soil erosion	Moderate
		Destruction of flora and fauna	Moderate
		Wastes generation and disposal/sanitation	Moderate
		Occupational health and safety concerns	Major
		Public safety and traffic issues	Moderate

No	Projects and Associated Activities	Potential Environmental and Social Impact Issues and concerns	Environmental Significance
		Fuel/electricity consumption	Minor - moderate
		Access roads usage	Moderate
		Raw water usage	Minor -moderate
		Resettlement related issues	Moderate
		Land take	Moderate
		Impact on cultural heritage sites	Minor
		Loss of livelihood	Minor
		Employment issues	Moderate
		Maintenance and waste disposal issues at operational phases	Moderate
4	Research programmes	Pesticide runoffs into surface water bodies (water pollution from agrochemical use)	Moderate
		Solid waste disposal issues	Moderate
		Disposal of obsolete or expired pesticides	Moderate
		Impact on soil structure of research fields	Moderate
		Public health and safety concerns	Minor – major
		Land take	Minor
		Resettlement/compensation related and encroachment issues	Minor- major
		Health, Safety and security concerns of staff/workers	Moderate

6.0 MITIGATION GUIDELINES

The mitigation measures are applied to impacts of environmental and social significance.

6.1 Mitigation considerations and options

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.

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

6.2 Recommended mitigation actions

General mitigation actions have been prepared to respond to potential environmental/social impacts and risks arising from project implementation. The mitigation guidelines have been designed following the mitigation hierarchy of avoidance, reduction, compensation or offsetting the negative environmental and social impacts. These actions are presented in the table below in a descriptive format.

Table 6.1 General Mitigations Actions for Potential Environmental and Social Impacts /Risks

Impact issues	Description of general mitigation actions
Bio-physical Environment	
Waste disposal	<u>General</u> • Construction contractors will prepare and implement a Waste Management Plan. • The Supervising Engineers will supervise the implementation of contractors' Waste Management Plan. <u>Solid non-toxic waste</u> • Adequate waste bins will be provided at project sites/camp sites during construction • Final disposal for construction wastes will be at dump sites approved by the local District Assembly. • The rehabilitation works for the research stations/seed centres will include provision of adequate waste bins for use during the operational phase. • Open air burning of wastes will not be allowed under the WAATP during the construction/rehabilitation phase. • MOFA will arrange with Waste Management Companies to handle and dispose wastes from research stations/seed centres. Alternatively, the project may consider the construction of a proper waste disposal sites for the agricultural research stations and other stations to be rehabilitated so that the current open burning practices and indiscriminate disposal are stopped. <u>Scrap materials</u> • Scrap materials from renovation/rehabilitation of buildings (e.g. old rain gutters, roofing sheets, metal fittings etc) will be collected and given out to accredited scrap dealers or disposed of at MMDA approved disposal sites. Scrap materials will not be buried in the area. <u>Waste oil /fuel</u> ▪ Spent or waste oil from construction vehicles and equipment will be collected and temporarily stored in drums or containers at site by the contractor. ▪ Contractor will ensure that waste oil is disposed of by an oil marketing company or recognized agents who have the capacity to undertake oil disposal. <u>Hazardous wastes</u> • Identify and separate hazardous wastes (e.g. asbestos materials, agrochemical containers, expired pesticides, wastes contaminated with oil or oily wastes etc) from all other wastes and temporary store such wastes in separately marked bins or storage areas. • Hazardous wastes will be disposed of in consultation with the EPA and the Environmental Health Unit of the Assembly <u>Human wastes</u>

Impact issues	Description of general mitigation actions
	• Contractors in charge of rehabilitation and renovation works will provide toilet facilities for construction workers. This will be made a contractual requirement. • The rehabilitation works of the Agric. Research Stations will include provision of decent and adequate toilet facilities for the use of staff. Currently labourers and technical staff quarters at the stations do not have adequate toilet facilities.
Air pollution	• The contractors will use and operate well maintained engines, vehicles, trucks and equipment. A routine maintenance program for all equipment, vehicles, trucks and power generating engines will be in place. • The contractor will ensure the use of good quality fuel and lubricants only. • If dust generation at the construction sites and unpaved access roads through local communities becomes a problem, limited wetting of the affected access roads, project sites and or unloading and reloading points will be done to reduce dust raising. • Speed limits through communities will be limited to ≤50km/hr on unpaved or untarred roads and near or at project site will be ≤30 km/hr). • Engines of vehicles/trucks and earth-moving equipment will be switched off when not in use. • Trucks carrying or delivering soil/sand and cement loads to and from site will be covered to prevent windblown dust from the loads into the communities/atmosphere. • Tipping of sand/laterite or offloading of cement will not be done in a windy or stormy weather conditions to reduce wind transport of sediments.
Noise and vibration	• The contractors will 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 made a contractual agreement. . • Contractors will 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, and contractors will avoid unnecessary tooting of horns in communities. • Engines of vehicles/trucks and earth-moving equipment will be switched off when not in use. • Chiseling and demolition activities associated with the rehabilitation/renovation works will be done during non-working hours or days. • As much as possible, the contractor will carry out excavation, demolishing and construction activities during the day and not in the night. • The Contractor will locate its concrete mixer and other construction machines and equipment away from inhabited residential quarters or other sensitive receptors such as schools, offices or health facilities. These equipment/machinery will not be operated behind or near these sensitive receptors but sited about 30m or more away. The siting distance will not result in complaints from the nearest receptors.

Impact issues	Description of general mitigation actions
Impacts on Landscape and Visual Receptors	• Where feasible, project sites will be boarded off from public view during construction. • Good house-keeping at construction sites will be implemented, such as regular cleaning, proper and orderly arrangement of materials and equipment, and regular removal and disposal of solid wastes at construction sites and work-camps.
Raw water use	• The contractors will inform and or obtain water abstraction approvals from the WRC if raw water from streams/rivers will be abstracted for used for construction activities. • The contractors will use reliable and acceptable water sources for construction activities
Water pollution and impact on aquatic life	• No garbage/refuse, oily wastes, fuels/waste oils will be discharged into drains or at the project areas/ grounds. • Contractors will prepare and 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. • Construction workers/project engineers will be required to report sightings of any injured or dead aquatic life (fishes) in nearby streams/rivers immediately to the district MOFA, regardless of whether the injury or death is caused by a Project activity. The information or report will be shared with the Regional EPA or MOFA WAATP ESSO. • Fuel storage tanks/sites will be properly secured to contain any spillage • Maintenance and cleaning of vehicles, trucks and equipment will take place offsite especially where project sites are close to water bodies. • The Contractors will dispose of excavated or demolished materials or construction wastes, which cannot be reused at sites approved by the MMDAs Waste Management Department. • The Contractors will put in place appropriate sediment barriers on slopes to prevent silt from entering water courses. • Contractors will be required to provide toilet facilities for construction staff to avoid indiscriminate defecation in nearby bush. • The rehabilitation/renovation works will consider the provision of adequate toilet facilities at the labourers, artisanal and technical staff quarters. • MOFA WAATP will not cultivate or develop demonstration farms close to streams but will always observe buffer zones which will take care of siltation issues. • For WAATP farm projects on hills, ploughing or cultivation will be done along the contour to minimise erosion.
Soil and Land degradation	Land clearing for new construction sites, field demonstration plots will be restricted to demarcated areas as much as possible to avoid unnecessary exposure of bare ground to the elements of the weather. • The Contractors will not carry out excavation or trenching works under aggressive weather conditions such as rains or stormy

Impact issues	Description of general mitigation actions
	conditions. • The Contractors will put in place appropriate sediment barriers on slopes to minimise soil erosion. • The contractors will be required to revegetate cleared areas as early as possible
Impact on fauna and habitat	▪ The contractors will avoid unnecessary exposure and access to sensitive fauna habitat areas ▪ Regular inspection or monitoring of identified or suspected sensitive habitats (e.g. swamps/ wetlands) will be carried out in the area prior to start and during work. ▪ If sensitive habitats are encountered, Project activities will cease and the Project engineers will consult the WAATP Environmental/Social Safeguard Officer (ESSO) to determine the appropriate course of action. The ESSO will engage the Wildlife Division for advice.
Decommissioning of contractor work-camps and sites.	• Social and Environmental Contract Clauses will be added in bidding documents such as the imperative and conditional agreement to clean up land before handing it over to the Government/MOFA.
Social Environment	
Involuntary displacement	• Implement the Resettlement Policy Framework (RPF) where possible cases of involuntary resettlement are expected during acquisition of community/individual lands for field demonstration plots and farmer field schools. • With regard to where major encroachments have occurred on project sites including agricultural research fields (e.g. Ashanti Mampong Agricultural Research Station), the government/MOFA will engage the TAs and PAPs under amicable resettlement arrangement in order for MOFA to regain control of the research fields. However, this activity will not be under the WAATP scope and therefore the WAATP ESMF/RPF will not apply
Loss of livelihood	• If an individual/farmer's farmland is required for a field demonstration plot, the affected person or farmer will be provided with livelihood assistance either in cash or in-kind. It will be done in accordance with the RPF. • Where structures used for business purposes occur on encroached portions of existing project lands, the business owner will be provided with livelihood assistance if his business activities will be interrupted or disrupted by the WAATP project and will be e done in line with the RPF.
Encroachment risk	• MOFA will engage and educate traditional authorities in charge of MOFA research stations lands and landlords of beneficiary communities not to sell or give away or allow community members to encroach on MOFA project lands or WAATP project sites.
Employment and Women	• Contractors will use local labour as much as possible and where available. All unskilled labour will be contracted or obtained from the local communities.

Impact issues	Description of general mitigation actions
marginalisation	• The contractors will be required to engage women during the construction phase as part of their recruitment policy. . • MOFA-WAATP will involve or engage women and the youth as part of its programme goals/targets. • Access to improved variety of seeds and seedlings as well as fertilizers and other chemicals needed to improve agricultural methods, will be enhanced by making them affordable to women farmers. • Women farmers will 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.
Deprivation of use of land	• Due process will be followed to establish the true owner of any land, be it family or stool land or individual for new project sites. Once established, the project will properly acquire the site. The compensation for the acquisition or temporary occupation will be based upon the provisions of the RPF. • Where individual's farmlands will have to be used as field demonstration plots, appropriate compensation will be paid to the owner in cash or in-kind for release of land for the project in line with the RPF.
Loss of structures/ properties	• For project sites to be used, irrespective of the land compensation, appropriate compensation will be paid to the owners for any structures/ properties/standing crops that will be affected. This will be done in accordance with the provisions of the RPF. • Where private structures or farms occur on existing project sites or agricultural research station fields (E.g. Ashanti Mampong Agricultural Research Station), and such structures or farms will have to be demolished or destroyed under the WAATP, appropriate compensation will be paid for the affected structures or standing crops in line with the provisions of the RPF.

Impact issues	Description of general mitigation actions
Impacts on Public Health/ Safety, Traffic and Sanitation	• Appropriate notices and warning signs will be erected around working areas and public areas to warn prospective trespassers of any danger or risk during the rehabilitation and construction • 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 will be used • Only experienced drivers/operators will be employed • The Contractors will hoard off construction sites if possible to prevent access by unauthorised persons. • Construction drivers and equipment operators will install or place warning signs near breakdown vehicles/equipment on access routes • 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. • Speed limit for all vehicles and construction equipment will be 30km/h or less at the project sites and 50km/h or less when moving through the local communities. • The Contractors will ensure that delivery trucks hired or contracted from third parties are in good condition to prevent breakdowns on roads. • 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. • The contractors will provide adequate sanitary/toilet facilities for workers, and open range defecation will not be countenanced. • Construction workers will be educated to adhere to basic rules with regard to protection of public health, including most importantly hygiene and disease (HIV) prevention, indiscriminate disposal of wastes. • Educate farmers in the proper use of pesticides and disposal of expired pesticides and pesticide containers • Train farmers in the correct use of PPEs for pesticide handling and educate farmers never to taste pesticides and not to apply pesticides when not in the appropriate PPEs. • MOFA-WAATP will make provision for emergency response to pesticide accidents and poisoning • WAATP will not have demonstration farms or farmer field schools near schools, hospitals or populated centres in order to avoid wind -blown fugitive pesticide sprays to such populated areas.
Impacts on cultural heritage/ecologically	• Before handing over of project sites to contractors, MOFA and the project engineering consultant will carry out pre-construction surveys to identify cultural heritage resources and existing ecologically sensitive areas that the project will avoid

Impact issues	Description of general mitigation actions
sensitive areas	and take adequate care/notice of. • Discuss and agree with owner/community if a cultural heritage resource identified can be relocated if possible. The relocation of any cultural heritage resource will be done in line with the provisions of the RPF. • The Project will 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.
Impacts on Worker Health and Safety	• The Project will require all contractors to implement an Environmental, Health and Safety Plan (EHSP), which will outline procedures for avoiding health and safety incidents and for emergency medical treatment. This will be a contractual requirement. . • Contractors will use suitable Personal Protective Equipment (PPE) including hard hats, high-visibility vests, safety boots and gloves and life vests as appropriate in accordance with the EHSP. • The Contractors will be required to train their staff/workers in the safe methods pertaining to their area of work to avoid injuries. • MOFA will install some streetlights at the stations to improve night illumination and security.
Community/ ongoing Stations work disruption	• Contractors to provide timely information on their work schedule to existing agricultural research/seed/ veterinary stations workers. • MOFA-WAATP to provide timely information to communities with regard to programme for field demonstration plots, farmers field schools and construction schedule for new project sites. • District MOFA to schedule regular meetings or interactions with the community • District MOFA to provide contact information on key persons on projects to local communities for contacting if necessary • MOFA-WAATP to implement grievance redress mechanisms and provide contacts of grievance redress committee members to local communities

7.0 FRAMEWORK FOR THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The framework for the Environmental and Social Management Plan (ESMP) provides guidance on procedures to be followed and standards to be met in implementing the WAATP which should be in agreement with national and World Bank safeguard provisions. Institutional arrangements with clearly defined roles and responsibilities as well as monitoring protocols to be followed to ensure that the required provisions are adhered to. Budgetary estimates are provided to support the implementation of the ESMP under Chapter 8. .

7.1 The Environmental and Social Preliminary Screening Process

The purpose of the preliminary screening is to: (i) determine whether projects are likely to have potential negative environmental and social impacts; (ii) decide if EPA Form EA1 needs to be submitted to EPA; (iii) identify appropriate mitigation measures for activities with adverse impacts; (iv) incorporate mitigation measures into the project design; (v) review and approve projects proposals and (vi) monitor environmental and social impacts and concerns during implementation. The early screening process will also consider the provisions of the Resettlement Policy Framework (RPF) for possible displacement and livelihood impacts.

The Regional/District MOFA Officers or the WAATP Environmental/Social Safeguard Officer (ESSO) must foremost carry out the preliminary environmental and social screening of proposed projects by using the checklist suggested in **Annex 4**. The EPA (Regional or National) should be informed of the screening outcome for further advice in line with the Ghana Environmental Assessment (EA) procedures. During preliminary screening of the projects/subproject activities by the District/Regional MOFA or WAATP Environmental/Social Safeguard Officer, where there may be doubt concerning project risks and impacts, the EPA should be consulted for guidance.

The Ghana WAATP will comprise of several subprojects, and most of which are expected to fall within Category C project. However, based on the outcome of the screening, any subproject/project activities that would be considered as Category A or B, the Ghana Environmental Assessment procedures must be followed and also an ESMP must be prepared to guide the implementation of the Category A or B projects.

7.2 ESIA Procedure to be followed for Projects

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 programmes 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-projects under the WAATP to obtain environmental permits if required.

Those projects requiring EPA clearance 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 are provided in the **Annex 1B** and are consistent with the World Bank categorization of projects.

The steps below will be followed by MOFA, the implementing agency to ensure environmental and social compliance of WAATP activities.

Step 1: Environmental Registration of Project

MOFA will appoint an Environmental/Social Safeguard Officer (ESSO) to provide safeguards supervision over all WAATP associated projects. The appointed Environmental/Social Safeguard Officer (ESSO) will be directly responsible for the registration of WAATP subprojects with the EPA as required by law. Following from the outcome of the preliminary screening exercise, the EPA will advise on which subprojects should be registered with the Agency. The Environmental Assessment Registration Forms are available at all EPA offices to register every project/ development that may have an impact on the environment.

A sample copy of the EA1 Form is provided in **Annex 5** 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 ESIA are mandatory, the ESSO should register with Form EA2, otherwise Form EA1 can also be used. This is a requirement under the Environmental Assessment Regulations LI 1652 (1999).

Step 2: Statutory Screening

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 WAATP-MOFA, the implementing agency, with reasons, which could be any of the following:

- Objection to the project
- No objection to the project and no further reporting required (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).

For projects receiving the 'no objection' from the EPA with no further reporting required (WB Category C project) and therefore have only minor environmental and social risks, the WAATP-MOFA 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

For the WAATP projects for which the decision is the conduct of a PEA (equivalent WB category B2 project) or and ESIA (WB Category B1 and A Projects), stand-alone reports will be prepared. The Ghana EPA statutorily requires an ESIA for agricultural projects in excess of 40ha.

The ESSO will prepare the Terms of Reference (ToR) 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 6** of this report.

The ESIA will identify and evaluate potential environmental impacts for the proposed activities, evaluate alternatives, and design mitigation measures. 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 (ToR)
The results of identification, and extent of the ESIA (scoping), the terms of reference will be prepared by the ESSO.

Second stage: Selection of consultant

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

- Description of the subproject
- Discussion and evaluation of alternatives
- Legal and regulatory framework
- Description of the environmental and social conditions of the study area
- Process of public consultations
- Identifying potential impacts of proposed sub-projects
- 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

The Environmental/Social Safeguard Officer will submit the draft ESIA report 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, 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.

Copies of the ESIA report 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)

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.

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)

Where the draft ESIA report is found acceptable, MOFA will be notified to finalise 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. 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 Fees and Charges (Amendment) Instrument 2015, LI 2228.

Other relevant World Bank provisions

The national provisions for the management of resettlement related issues are not as fully developed and therefore not consistent with the World Bank safeguard policy requirements. Thus, it is expected that the WB OP 4.12 will be mostly applied under the WAATP and a separate document to guide the process, i.e. a Resettlement Policy Framework (RPF) document has been prepared as a standalone report to support the social management and acceptability of the projects. 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 document.

7.3 Technical Specifications and Standards

7.3.1 Technical specifications

WAATP-MOFA with technical support from relevant MOFA directorates and the regional and district offices, will be responsible for the development and presentation of clear guidelines for the design and provision of technical specifications and standards for project implementation. These will ensure the

streamlining of approaches and activities for sound environmental and social implementation of projects. These will include adequate reference to sector norms or best agricultural practices or prescribed national codes of practices or international best practices.

7.3.2 Environmental standards

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

7.4 Monitoring plan and indicators

Monitoring plan has been developed for implementation at the project level, and this is described in **Table 7.3**.

Table 7.1 Project monitoring indicators and responsibilities – WAATP Projects and Activities

Impact issue	Proposed Mitigation 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 MMDA approved waste dump sites <u>Hazardous wastes</u> -Separate hazardous wastes (agrochemical containers, asbestos etc) from all other wastes -Liaise with EPA to dispose of hazardous wastes such as asbestos materials	-EHSP/Waste Management Plan/Construction site management plan PMP	Number of site waste bins Final disposal records	Weekly checks by project engineers	Construction and Operation	Contractors/project engineers and MOFA
Waste oil/fuel disposal	Provide drums or containers for temporarily storage of waste oil from construction 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 and Operation	Contractors/ project engineers and MOFA
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 at 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	-Independent checks by project engineers Maintenance records verified by project engineers -Self check by contractor	Construction	Contractors / project engineers and MOFA
Impacts on Landscape and	Fence of project sites from public view and ensure good house-keeping	Construction site management plan	Implementation of Plan	-Self check by contractor	Construction	Contractors / project engineers

Impact issue	Proposed Mitigation Action/ Measures	Implementation tool/ criteria	Monitoring/ indicators	Verification	Project stage	Responsibility
Visual Receptors	at construction sites					and MOFA
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 and MOFA
Raw water use	-Notify and obtain water use approval from WRC if stream/ river water will be abstracted for construction activities	-Confirmation of construction water use source -WRC permit	-WRC permit schedule -Source of construction water	Project engineers to verify	Construction/ rehabilitation	Contractor/ project engineers
Water pollution	-Do not discharge garbage/refuse, oily wastes, fuels/waste oils into drains or water bodies -Properly secure fuel storage tanks/sites -Maintenance and cleaning of vehicles, trucks and equipment to be done offsite. -Provide toilet facilities for construction workers. -Do not have demonstration farms close to water bodies but always observe buffer zones. -For WAATP projects on hills sloppy areas, plough or cultivate along the contours to minimize soil erosion. <u>Pesticides use</u> -Control and supervise pesticides use under the WAATP. -Educate farmers on proper use and handling of pesticides -Do not dispose obsolete or expired pesticides into drains but liaise with EPA for disposal <u>Human waste disposal</u> -Contractor to provide toilet facilities for construction workers.	EHSP/ waste management plan Spill prevention and control plan/EHSP Construction site management plan EHSP PMP	-Visibility of oil on water bodies -On site erosion features Proposed actions implemented Toilet facilities in place	-Daily self-checks by contractors -Periodic reports on performance by contractor to project engineers -Spot checks/audits by project engineers Periodic reports by research units and ESSO Project engineers/	Construction and Operation	Contractors / project engineers and MOFA Research Units/ ESSO

Impact issue	Proposed Mitigation Action/ Measures	Implementation tool/ criteria	Monitoring/ indicators	Verification	Project stage	Responsibility
	-MOFA-WAATP to provide toilet facilities for labourers and technical staff at the various agric/vet stations			MOFA to verify		Project engineers/ MOFA/ESSO
Impact on terrestrial fauna and habitat	-Avoid unnecessary exposure or access to sensitive habitat. -Regularly inspect or monitor sensitive areas e.g. swamps/ wetlands in 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 inform the WAATP ESSO to determine the appropriate course of action.	Presence of sensitive habitat at project area	-Regular self-checks by contractor -	Construction	Contractors / MOFA/ESSO/ EPA
Impacts on drains/ streams/water bodies and Fauna/ habitat	-Ensure proper storage and handling of fuels, oil, wastes, and other potentially hazardous materials. -Regularly monitor drains/streams or known sensitive areas. -Avoid disturbing habitat or sensitive areas near working areas.	-Hazardous material management plan/ oil spill prevention and control plan -Regular fauna observation report -Awareness raising for contractor personnel	Implementation tools Water accidents/incidents recorded	-Daily self-checks by contractor -Periodic reports on performance by contractor to client -Spot checks and audit by project engineers -Grievances recorded	Construction and operation	Contractors / project engineers and MOFA

Social Impact Assessment – WAATP Projects and Activities

Type of impact	Description of mitigation measures	Implementation tool/ criteria	Monitoring indicator	Verification	Project stage	Responsibility
Physical displacement	For acquired sites, the affected persons to be given appropriate compensation (cash or kind)	RPF and resettlement plan	PAPs and properties removed and absent from site	Records to confirm PAPs received or provided with compensation Resettlement plan implemented	Pre-construction	ESSO/MOFA
Employment and loss of livelihood	PAPs provided with livelihood assistance or assisted to get new jobs immediately without any loss of income.	RPF	Complaints from local communities and PAPs	PAPs employed elsewhere or evidence of livelihood assistance given	Pre-construction	ESSO/MOFA

Type of impact	Description of mitigation measures	Implementation tool/ criteria	Monitoring indicator	Verification	Project stage	Responsibility
	General Use local labour as much as possible and where readily available.	Contractor labour policy		Project engineers to verify quota to locals prior to recruitment of construction workers	Construction	Contractors / MOFA
Deprivation of use of land	Land acquisition	RPF/ Resettlement plan	RPF/ Resettlement plan implementation	Evidence of compensation paid -Resettlement plan implemented	Pre-construction	ESSO/MOFA
Encroachment risks	MoFA to educate traditional authorities of MOFA research stations and landlords of beneficiary communities not to sell or allow community members to encroach upon WAATP or MOFA project sites	MOFA Annual Programmes	Education programme in place	Records of education programme carried out	Construction/ Operation	MOFA and WAATP
Loss of structures/ properties	Compensation for loss of permanent structures and assist to relocate other properties.	RPF/ Resettlement Plan	RPF implementation Resettlement plan implementation	Evidence of acceptable compensation paid Evidence of Resettlement plan implemented	Pre-construction	MOFA
Impacts on public/worker Health/ Safety and sanitation	-Place notices and warning signs at working areas -Train all construction workers in safe methods of working. -Cover buckets of trucks carrying construction materials such as sand, quarry dust, etc to project sites -Use road worthy vehicles/trucks and experienced drivers/operators -Active construction areas to be marked with high-visibility tape -Secure open trenches and excavated areas. -Provide adequate sanitary facilities -Provide PPEs for construction workers.	EHSP Vehicle maintenance programme/plan in place Construction site management plan EHSP	-Grievance records -Health and safety incident register -Grievance records	Warning signs/ notices in place 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 and project engineers

Type of impact	Description of mitigation measures	Implementation tool/ criteria	Monitoring indicator	Verification	Project stage	Responsibility
	-Educate construction workers on site rules/regulation and hygiene and disease (HIV) prevention. -Provide street lights at the research stations/ seed centres to improve night illumination and security. -Do not have demonstration farms close to schools, hospitals or populated areas to avoid wind-blow pesticide sprays carried to such areas <u>Pesticide handling</u> -Educate farmers in the proper use of pesticides and never to taste pesticides -Train farmers on how to use PPEs -Provide emergency response to pesticide accidents and poisoning	MOFA/WAATP Plans PMP		Street lights in place Siting of demonstration farms Periodic reports by ESSO and research outfits		MOFA-WAATP ESSO/ Research Units
Impacts on cultural heritage/ archaeological interest /existing 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	Contractors and project engineers
Marginalisation of women	-Involve women and youth in WAATP activities/projects -Contractor recruitment policy to be gender sensitive.	ESMF and WAATP PIM	-no of women and youth benefitting from WAATP -no of women engaged by contractors	-periodic survey and assessment reports	Construction and Operation	Contractor and MOFA

8.0 INSTITUTIONAL CAPACITY FOR ESMF IMPLEMENTATION AND BUDGETARY PROVISIONS

8.1 Institutional Arrangements for ESMF Implementation

The main institutions involved with the implementation of the ESMF include:

- MOFA
- Project Steering Committee
- WAATP Project Coordinating Unit (PCU)
- Metropolitan/Municipal/District Assemblies (MMDAs)
- Environmental Protection Agency (EPA)
- Lands Commission
- Water Resources Commission
- Private Sector – Consultants and Contractors
- Donor – World Bank

The WAATP PCU will comprise of the following key experts:

- Project coordinator:
- Environmental/Social Safeguards Specialist
- Communication Specialist
- Procurement Specialist
- Technical Specialist
- Financial Management Specialist
- Monitoring and Evaluation Specialist
-

The implementation activities will be under the overall guidance of the WAATP-MOFA PCU. The responsibilities of the various institutions are presented in the table below.

Table 8.1 **Institutional framework**

No.	Institution	Responsibility
1.0	Ministry of Food and Agriculture (MoFA)-WAATP PCU	• Overall supervision of the ESMF implementation. • Disclosure of the ESMF cleared by the World Bank prior to its implementation. • Instruct the regional/district MOFA to carry out screening of subproject activities • Review and take a decision on completed screening checklist forms submitted by the district/regional MOFA. • Determines that a RAP or ARAP is required for a subproject activity. • Hiring of consultants/NGO to prepare ESIA and responsible for subsequent implementation of ESIA.
2.0	MOFA (Regional and district offices)	• Screening of subprojects • Submit completed screening checklist forms to MOFA-WAATP PCU.

		• Develop an MOU between PAPs and MOFA WAATP to govern all lands released by farmers/communities for demonstration/test plots. • Assist with ESMF implementation in general • Assist in grievance redress matters
3.0	Project Steering Committee	The Project Steering Committee will be chaired by the Honourable Minister of Food and Agriculture. The committee will provide policy guidance and orientation to the national coordination and implementation units of the program and will also ensure coherence of WAATP with the National Agricultural Policy Interventions.
4.0	Environmental Protection Agency (EPA)	• Review completed EPA Form EA 1 submitted to it by the MOFA-WAATP Environmental/Social Safeguard Officer on subprojects and advise on level of environmental assessment required • Assist with training and capacity building of other institutions • Assist with external monitoring and evaluation RPF implementation and social impacts
5.0	Lands Commission	• Assist in the valuation of affected properties and compensation due PAPs.
6.0	Water Resources Commission	• The WRC is responsible for granting licenses for any raw water use activity and the implementation of the riparian buffer zone policy.
7.0	MMDAs	• Assist with community awareness creation, notifications and support in the inventory of affected persons and compensation related issues. • Assist in grievance redress matters
8.0	Consultants/Contractors	• Consultants will be engaged to prepare ESIAs if necessary and assist with implementation and capacity building. • Contractors will be engaged to carry out the rehabilitation /renovation works and will have to comply with the ESMF requirements on impacts and mitigation actions
9.0	Donor- World Bank	• To be involved with supervision of the project through periodic implementation support missions to WECARD/CORAF and supervision missions to monitor progress of implementation.

Key description of some key institutions are provided below.

Ministry of Food and Agriculture (MOFA)

The Ministry of Food and Agriculture (MOFA) has established a unit with focus on environmental issues. The Land and Water Management Unit which is under the Crop Services Directorate (CSD) collaborates strongly with the EPA to mainstream environment into policy decisions. MOFA is the government ministry spearheading the WAATP effort and WAAPP-MOFA is playing a coordinating role among all the main stakeholders to ensure project success. The Directorate of Agricultural Extension Services, PPRSD

and the regional/district MOFA offices will play key roles to ensure sound implementation of projects to ensure good agricultural practices and environmental sustainability. The environmental and social management capacity at the regional and district MOFA offices will need to be enhanced and utilized for the environmental success of the project.

Environmental Protection Agency (EPA)

The EPA is responsible for ensuring compliance with laid down ESIA procedures in Ghana in accordance with the EPA Act 1994 (Act 490) and the Environmental Assessment Regulations 1999, and the Agency is expected to give environmental approval for WAATP Projects requiring EPA approval. 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, it is constraint with logistics especially transport which therefore limits its monitoring and enforcement functions.

Water Resources Commission (WRC)

The WRC is responsible for granting licenses for any raw water use activity and the implementation of the riparian buffer zone policy. All project activities requiring such water use license will receive assistance from the WRC and the Commission will also ensure that projects occurring near streams/ water bodies observe the prescribed buffer zone limits.

Lands Commission

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

Metropolitan/Municipal/District Assemblies (MMDAs)

The MMDAs are the planning authorities, charged with the overall development of the district/municipal/metropolis. Copies of the ESMF will be disclosed at the MMDAs for the public access. The MMDAs will confirm or approve waste disposal sites for contractors and also be involved with grievance redress issues. The Planning Section, Works Department and the Environmental Units of the MMDAs may play relevant roles on behalf of the Assembly, and should be involved in any ESMF training programmes under WAATP.

Private sector – Contractors and Engineering Consultants

The contractor to be hired for the rehabilitation/renovation works and construction of new facilities and the engineering consultants to be engaged to supervisor the activities of the various contractors are key to the successful implementation of the ESMF. ESMF training programmes should identify the key foremen and engineers of contractors/consultants for capacity building.

Table 8.2 provides a summary of the stages and institutional responsibilities for the environmental screening, assessment, approval and implementation of the WAATP activities.

Table 8.2 Summary of Environmental Screening and Assessment Process and Responsibilities

No.	Stage	Institutional responsibility	Implementation responsibility
1.0	Preliminary screening of Infrastructure sub-project to determine their safeguard requirements and also to assist in project formulation using checklist	MOFA	Regional/District MOFA officers and Environmental /Social Safeguard Officer (ESSO)
1.1	Advise on which WAATP subprojects to register with the EPA following preliminary screening	EPA	Regional or National EPA
1.2	Statutory Environmental Registration of WAATP subproject	WAATP PCU/ MOFA	WAATP-ESSO
2.0	Determination of appropriate environmental assessment level/ category.	EPA	National EPA
3.0	If ESIA is necessary	EPA/ MOFA	
3.1	Preparation of terms of reference	WAATP MOFA	ESSO
3.2	Validation of ESIA/ESMP ToR	EPA/World Bank	-
3.3	Selection of Consultant	WAATP-MOFA	ESSO/ Procurement Specialist
3.5	Preparation and publication of scoping reports	Consultant	-
3.4	Preparation of ESIA report	Consultant	-
4.0	Review and Approval of ESIA	WAATP/EPA/ World Bank	WAATP ESSO
4.1	Issuance of environmental permit for project implementation	EPA	-
4.2	Public Consultation and disclosure	WAATP-MOFA/EPA/ World Bank	ESSO/Contractor/ Consultant
5.0	Implementation of ESIA	WAATP-MOFA, Contractor	ESSO/ Project implementers
6.0	Surveillance and monitoring	MOFA/EPA/ World Bank	ESSO, M&E Specialist, EPA

8.2 Capacity Building Requirements

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 WAATP.

The objectives and provisions of this ESMF therefore cannot be achieved in the absence of relevant competencies on environmental and social management within MOFA, MMDAs 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

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. 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 (focal persons at the directorates and regional/district offices) and WAAPP officers 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.

The WAATP ESSO to be engaged should 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/district MOFA officers and focal persons from the Directorates.

8.3 Budgetary provisions

The awareness creation, capacity improvement and training workshops as well as some logistical support expenses for key stakeholders involved in the implementation of the ESMF is estimated at US$140,000 over the 5- year project life as explained in the **Table 8.3** below.

Table 8.3 Estimated budget to implement ESMF

No.	Activity	Description	Unit cost, US$	No	Total Cost, US$
1.	Awareness creation and Capacity building for MOFA Directorates focal persons, WAATP project staff, beneficiary agric research/veterinary stations, and seed centres	Training workshop on ESMF implementation and ESIA procedures and WB safeguard policies – OP 4.01, OP 4.12, OP 4.09	10,000	Annually for 2 years	20,000
2.	Capacity building/ improvement for Regional/District MOFA officers and Extension officers, FBOs/farmers	Training workshops on ESMF, ESIA procedures and WB safeguard policies – OP 4.01, OP 4.12 and OP 4.09	10,000	Annually for 3 years	30,000
3.	Capacity building for	Training workshops on ESMF,	20,000	1	20,000

	MMDAs, Contractors and Engineers, CSOs	World Bank Safeguard Policies- OP 4.01, OP 4.09 and OP 4.12			
4.	Public awareness creation on WAATP and ESMF	Radio discussions on local FM stations	LS	-	10,000
5.	ESMF Disclosure	ESMF disclosure advertisement in national dailies	Lump sum (LS)	1	5,000
		Disclosure of ESMF – copies to stakeholders	LS	1	5,000
6.	Monitoring and evaluation	Hiring of consultants/ experts and preparation of reports	LS		50,000
7	**TOTAL**				**140,000**

9.0 PUBLIC CONSULTATIONS AND INFORMATION DISCLOSURE

9.1 Stakeholder consultations

The ESMF preparation included stakeholder consultations. WAAPP-MOFA provided a list of key project stakeholders for consultations and these included the key Directorates of MOFA and the EPA. The consultant also engaged the station managers at Asuansi and Mampong Agricultural Research Stations. Stakeholders consulted so far include:

- WAAPP-MOFA
    - Project Coordinator
    - Monitoring and Evaluation Officer
    - The Technical Expert
- Directorate of Agricultural Extension Services (DAES), Accra;
    - Deputy Director
- Veterinary Services Directorate, Accra
    - Deputy Director & Head, Accra Vet. Lab
- Directorate of Crops Services (DCS) of MOFA, Accra
    - Deputy Director
    - Manager in charge of Land, Water and Environment Unit
- Environmental Protection Agency (EPA), Accra
- Station Manager and Supervisor, Asuansi Agricultural Research Station, Asuansi, Central Region
- Station Manager, Mampong Agricultural Research Station, Mampong-Ashanti
- Town & Country Planning Officer, Mampong Municipal Assembly

The consultations served to learn lessons from the environmental and social issues which were associated with the WAAPP and also to gather information on likely WAATP activities, issues of environmental/social concerns, institutional mandates and permitting requirements for WAATP to inform the preparation of the ESMF.

The list of stakeholders contacted and issues discussed and some field pictures (see Plates 9.1 and 9.2 below) are presented in the Stakeholder Consultation report provided in **Annex 7.** Some key stakeholder issues/comments, concerns raised include:

- Lack of toilet facilities at the labourer and artisanal staff quarters at the agricultural stations leading to open defecation.
- Inadequate toilet facilities for technical staff at the agricultural stations.
- Serious encroachment of the research fields of the Ashanti Mampong Agricultural Research Station which could affect the WAATP implementation at the site if the government/MOFA does not take immediate and urgent steps to recover the encroached fields. The traditional authorities have almost given out all the research fields for private residential property development and the TAs have made known their intention to relocate the Agricultural station.
- Inability to trace the land documents for the Ashanti Mampong Agricultural Research Station land is also fuelling the encroachment of the land.

- Asbestos materials to be generated from the rehabilitation of the agricultural stations.
- No central waste disposal site for the agricultural stations. Waste disposal is by open air burning.
- The Kakum River, which supplies raw water for treatment and distribution to the Cape Coast Township and its environs passes through the Asuansi Agricultural Station property.
- The agricultural stations are not well-lit in the night and there is no streetlights or floodlights.

Some suggestions made by the stakeholders include:

- Beneficiary farmers with 40 ha or more should be trained in the WAATP PMP.
- Training should be organised for agro processors as well. E.g. cassava processors with regard to proper disposal of wastewater and management of odour.
- Need to identify handicap farmers/people, single mothers with children for inclusion under WAATP.
- Landlords of participatory farmers should be educated not to sell or give away specific lands allocated for WAATP project activities to estate developers.
- The WAATP safeguard officer should go to the field with the Monitoring & Evaluation team.
- Every subproject or activity under WAATP should be screened before it starts.
- Final advice on screening should be done by the EPA.
- Proper Memorandum of Understanding (MOU) arrangements for either cash or in-kind compensation should be put in place for farmers whose fields or plots are used for demonstration purposes.
- There should be a budget for compensation under WAATP.
- The involvement of EPA in WAATP ESMF implementation will ensure compliance.
- Do not cultivate near streams. Observe buffer zones which will take care of siltation issues.
- Do not cultivate near schools, so that spraying of pesticides do not get to school pupils by wind.
- Cultivation on hills must be on the contour to minimise erosion.
- Farmers should be educated never to test pesticides using their tongues before using or applying them.
- Farmers should be educated and trained in how to use Personal Protective Equipment (PPEs) and should be educated not to apply pesticides when not in the appropriate PPEs.

Plate 9.1 Meeting with the Asuansi Agric. Research Station Master

Plate 9.2 Site inspections of encroachments at Mampong Agric. Research Station

9.2 ESMF Disclosure and Consultations

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. WAATP-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. The MOFA will assist to select display venues upon consultation with the EPA. 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 brief description of the Project;
- a list of venues where the ESMF report is on display and available for viewing;
- duration of the display period; and
- contact information for comments.

As provided under WB safeguard policy OP 4.01, consultation and disclosure on the WAATP ESMF will be organized as follows:
As provided under WB safeguard policy OP 4.01, consultations and disclosure on the WAATP ESMF will be organized as follows:

<u>Consultations</u>

- Organize workshops, community forum etc for stakeholders to make meaningful inputs/contributions into the ESMF before its finalized; or
- Circulate the draft ESMF for comments to all relevant institutions (e.g. WAAPP-MOFA, relevant MOFA directorates involved with the WAATP, Water Resources Commission, Lands Commission, EPA, Ministry of Local Government & Rural Development/relevant MMDAs, relevant Traditional Authorities and the World Bank; and

- Also, one-on-one consultations can be organized with major stakeholders or institutions.

Disclosure

- Publication in the dailies, community bulletin boards (especially at project communities), workshops, community forums/radio presentations
- Distribution of the cleared ESMF to stakeholders (e.g. relevant district assemblies, district/regional MOFA offices, regional EPA offices)
- Publication of the cleared ESMF at the World Bank and MOFA websites

10.0 GRIEVANCE REDRESS MECHANISM

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.

The World Bank 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 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.

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.

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 and RPF has developed a grievance management process to serve as a guide during project implementation. The grievance management guide to be followed by WAATP-MOFA is provided in **Table 10.1,** which is similar to the grievance redress set up under the RPF**.** The grievance redress committee set up under the RPF should also handle issues under ESMF implementation. The general steps of the grievance process comprise:

- Registration and receipt of Complaints;
- Determining and Implementing the Redress Action;
- Verifying the Redress Action;
- Monitoring and Evaluation; and
- Dissatisfaction and Alternative Actions.

The grievance redress mechanism should make provision for two tier amicable mediation and settlement. The first tier should involve the grievance redress committee resolving the issue at the district/community level. If the issue is not resolved at the district level, then the 2nd tier should involve the WAATP PCU to constitute an appropriate team including regional/national stakeholders including the Member of Parliament (MP) for the area (or his/her representative) to resolve the matter. When these two tiers of amicable mediation arrangement fail, the complaint is free to seek redress at the court of law.

World Bank Group Grievance Redress Service

Communities and individuals who believe that they are adversely affected by a World Bank Group (WBG) supported program, may submit complaints to existing program-level grievance redress mechanisms or the WBG's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address program-related concerns. Project affected communities and individuals may submit their complaint to the WBG's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WBG non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the WBG's attention, and WBG Management has been given an opportunity to respond. Information on how to submit complaints to the WBG's corporate Grievance Redress Service (GRS) can be obtained from the website (http://www.worldbank.org/GRS). Information on how to submit complaints to the WBG Inspection Panel can be obtained from the website (www.inspectionpanel.org).

The World Bank is supporting more effective approaches to problem solving to help strengthen its performance and development outcomes. This strengthened corporate approach focuses on a preventive approach to identify, track and resolve grievances early; and offering lower-cost, rapid citizen redress at the project and country level through mediation, facilitation or other problem solving processes where it is most needed.

The approach proposes three interlinked steps: (i) a risk-based assessment of potential grievances, disputes or conflicts that may arise during project preparation and implementation; (ii) identification of the client's existing capacity for grievance redress; and (iii) an action plan that identifies priority areas for strengthening grievance capacity, or if necessary, establishing new mechanisms at the project level. Where applicable, dedicated resources should be allocated to realize the action plan.

Table 10.1 Proposed grievance redress mechanism

Steps	Process	Description	Time frame
1.	Grievance receipt and registration/ logging	-Face to face; phone; letter, recorded during public/ community meetings; recorded from Assemblyman/woman, etc -Significance assessed and grievance recorded or logged using the model complaint form and filed. 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	1-2 Days
2.	Development and implementation of response	-GRT meets or takes a decision on the grievance -Grievance assigned to appropriate party for resolution if necessary -Response development with input from relevant stakeholders -Redress response/action approved by GRT and logged -Redress response/update of progress on resolution communicated to the complainant -Start implementing redress action	5- 10 Days
3	Verifying the implementation of redress action	-Redress action implemented and verified by GRT. -GRT satisfied with implementation of redress action	10-15 Days
4	Close grievance or refer grievance to 2nd tier resolution	-Completion of redress action recorded or logged -Confirm with complainant that grievance can be closed or determine what follow up is necessary -Record final sign off of grievance If grievance cannot be closed, return to step 2 or recommend 2nd level settlement	15-25 Days
5	Court of law	-if 2nd level settlement does not address dispute, complainant can resort to court of law	Unknown
6	Monitoring and evaluation, and reporting	Grievance Redress Mechanism Process is documented and monitored	-

11.0 MONITORING AND EVALUATION

Monitoring plan is developed to track safeguard provisions at both the Environmental and social safeguards framework level and sub-project activity level. The proposed plans are presented in the **Table 11.1**. The table confirms the verifiable indicators as well as responsibilities for the various monitoring actions.

The monitoring issues at the ESMF level include the dissemination of both ESMF and RPF documents as well as capacity building and training activities. At the sub- project activity level, this will encompass instituting monitoring actions to, for example, confirm the Screening of projects, preparation of the ESIA reports, acquisition of environmental permits etc.

Table 11.1 ESMF monitoring and responsibilities

No	Monitoring level	Monitoring Issue	Verifiable indicators	Responsibility
1.	ESMF level	Adequate dissemination of ESMF and RPF to stakeholders	Record of consultations and meetings	WAATP-MOFA/ Consultants
			Workshop reports	
		Capacity building and training programs	Training reports	MOFA / Consultants
2.	Sub- project activity level	Screening of sub project	Completed or filled checklists	Regional/district MOFA, ESSO
		Completion of EA1 form	Completed EA1 Form submitted to the EPA	WAATP ESSO
		Adequate mitigation measures provided to manage adverse impacts	Relevant ESMF Chapter referenced or ESMPs prepared	WAATP ESSO/ MOFA
		Project satisfies statutory provisions EPA Act 1994 (Act 490) and LI 1652	EPA Permit for project	WAATP ESSO/ EPA
		project monitoring and evaluation	Monitoring reports, annual environmental reports	WAATP ESSO & M&E / EPA

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ANNEXES

ANNEX 1A

UNDERTAKINGS REQUIRING REGISTRATION and ENVIRONMENTAL PERMIT (EPA LI 1652 (1999))

SECTOR	Sub sector	Description
AGRICULTURE	Community Pastures	Involving the clearing of land greater than 40 ha Involving the clearing of land located in an environmentally sensitive area
	Fruit and other vegetable farms	Management areas: Involving the clearing of land greater than 40 ha Involving the clearing of land located in an environmentally sensitive area
FISHING AND TRAPPING	Fishing	a. fish or shell fish farming in salt water, brackish water or fresh water, where the proposal includes the construction of shore-based facilities other than wharves; b. permanent traps or weir fisheries, salt water.
	Services incidental to fishing	Fish or shellfish breeding and propagating services, or fish or shellfish hatchery services, where the proposal includes the construction of shore based facilities other than wharves.
LOGGING AND FORESTRY	Logging	Management of forested land for the primary purpose of harvesting timber in a contract area.
	Forestry services	a. application of pesticides; b. introduction of exotic species of animals, plants or microbial agents.
MINING	Metal mines Non metal mines	-
CRUDE OIL AND NATURAL GAS	Crude oil or petroleum production facilities Natural gas production facilities	
QUARRIES AND SAND PITS	Stone quarries	Where the total area is greater than 10ha, OR Where any portion is to be located within an environmentally portioned area
	Sand and gravel pit	a. where the total area is greater than 10 hectares, or b. where any portion is to be located within an environmentally sensitive area.
FOOD	Meat and poultry products	a. abattoirs; b. meat, fat or oil processing facilities c. poultry processing facilities.
	Fish products	-
	Flours, prepared cereal foods and feeds Feed mills	-
BEVERAGES	Distillery products Brewery products Wines	-

SECTOR	Sub sector	Description
RUBBER PRODUCTS	a. tyres and tubes; b. rubber hoses and beltings; c. other rubber products	-
PLASTIC PRODUCTS	a. tyres and tubes; b. rubber hoses and beltings; c. other rubber products	-
LEATHER AND ALLIED PRODUCTS	Man made fibres and filament yarns Spun yarns and woven cloths Broad knitted fabrics	-
TEXTILE PRODUCTS	Natural fibres processing and felt products Carpets, mats and rugs Canvas and related products Other textile products	-
WOOD	Sawmill, planning mill and shingle mill products industries Veneers and plywoods Other wood products Wood preservation facilities which use hazardous chemicals or similar chemical processes Particle board or wafer board production	-
PAPER AND ALLIED PRODUCTS	Pulp and paper Asphalt roofing Other converted paper products	-
PRIMARY METALS		-
FABRICATED METAL PRODUCTS		-
TRANSPORTATION EQUIPMENT		-
REFINED PETROLEUM PRODUCTS	Agricultural chemicals Plastics and synthetic resins Paints and varnishes Soaps and cleaning compounds Other chemical products	-
OTHER MANUFACTURING	Scientific and professional equipment	Photographic films and plates manufacturing Floor tiles, linoleum and coated fabrics manufacturing Other manufacturing products
CONSTRUCTION	Industrial construction (other than buildings)	a)Construction of pipelines for the transmission of oil, natural gas and other related products from the source to the point of distribution, where: Any portion of the pipeline is to be located at a distance greater than 500m from an existing right of way; or

SECTOR	Sub sector	Description
		Any portion of the pipeline is to be located in an environmentally sensitive area b)diesel electric power generating plants having capacity greater than 1 megawatt a gas turbine electric power generating plants having capacity greater than 1 megawatt c)nuclear electric power generating plants
HIGHWAYS AND HEAVY CONSTRUCTION	Roads	-
	Waterworks and sewage system	Construction of trunk pipelines for transmission of water from the source to the point of distribution Construction of trunk sewer pipelines Construction of trunk sewer pipeline outfalls
	Hydroelectric power plants and related structures	Construction of dams and associated reservoirs Inter or intra basin water transfers Construction of hydroelectric power developments
UTILITIES		Establishment of waste disposal sites Establishment of facilities for the collection or disposal of hazardous waste materials
WHOLESALE TRADE	Petroleum products	Wholesale establishment of petroleum products storage facilities
	Waste materials, wholesale	Establishment of facilities for the purpose of assembling, breaking up, sorting or wholesale trading of scrap, junk or waste material of any type
SERVICES	Economic services administration	Resource conservation and management programmes involving introduction of exotic species of animals or plants for any purpose; Resource conservation and management programmes involving introduction of native species of animals or plants into areas where those species do not occur at the time of the proposed introduction Designation of land for cottage development or other recreational development
ACCOMMODATION SERVICES	Establishment of recreation and vacation camps	-
AMUSEMENT AND RECREATIONAL SERVICES	Commercial spectator sport	Establishment of horse racetrack operations Establishment of racetrack operations for motorized vehicle sports and recreation clubs and services Establishment of facilities, including trails Establishment of outdoor firearm ranges Establishment of marina operations Establishment of facilities, including trails for mortised recreational vehicles Other amusement and recreational services

ANNEX 1B:

UNDERTAKINGS FOR WHICH ESIA IS MANDATORY

SECTOR	SUBSECTOR	DESCRIPTION
AGRICULTURE	-	Land development for agricultural purposes not less than 40 ha Agricultural programmes necessitating the resettlement of 20 families or more
AIRPORT	-	Construction of all airport or airstrips as well as the enlargement of existing airports or airstrips
DRAINAGE AND IRRIGATION	-	Construction of dams and man- made lakes; Drainage of wetlands; Irrigation schemes
LAND RECLAMATION	-	Coastal land reclamation Dredging of bars, estuaries
FISHERIES	-	Construction of fishing harbours Harbor expansion Land based aquaculture undertaking
FORESTRY	-	Conversion of hill forest land to other use Logging or conversion of forest land to other land use within the catchment area of reservoirs used for water supply , irrigation or hydropower generation or in areas adjacent to forest, wildlife reserves Conversion of wetlands for industrial, housing or agricultural use
HOUSING	-	Human settlement development undertaking Housing development
INDUSTRY	Chemical	Production capacity of each product or combined products is greater than 100 tonnes/ day
	Petrochemical	All sizes or raw material requirements of 100 tonnes/ day or greater
	Non- ferrous smelting	Aluminum- all sizes Copper- all sizes Others- producing 50 tonnes/ day and above product
	Non- metallic Cement lime	10 tonnes/ day and above burnt lime rotary kiln or 50 tonnes/ day and above vertical kiln
	Iron and steel Shipyards Pulp and paper	
INFRASTRUCTURE	-	Construction of hospitals Industrial estate development Construction of roads and highways Construction of new townships Construction of railways
PORT	-	Construction of ports Port expansion involving an increase of 25% or more in handling capacity per annum
MINING	-	Mining and processing of minerals in areas where the mining lease covers a total area in excess of 10ha

SECTOR	SUBSECTOR	DESCRIPTION
	Quarries	Proposed quarrying of aggregate, limestone, silica, quartzite, sandstone, marble and decorative building stone within 3km radius of any existing village, residential, commercial or industrial areas, or any area earmarked for residential, commercial or industrial development
	Sand dredging	
PETROLEUM	Oil and gas fields development Construction of off- shore and on- shore pipelines Construction of oil and gas separation, processing, handling and storage facilities Construction of oil refineries	Construction of product depot for the storage of petrol, gas, diesel which are located within 3km of any commercial, industrial or residential areas.
POWER GENERATION AND TRANSMISSION	-	Construction of steam generated power stations; Dams and hydroelectric power schemes; Construction of combined cycle facilities in national parks Construction of nuclear fueled power stations Erection of power transmission lines
RESORT AND RECREATIONAL DEVELOPMENT	-	Construction of coastal resort facilities of hotels with more than 40 rooms Hilltop resort or hotel development Development of tourist or recreational facilities in national parks Development of tourist or recreational facilities on island waters
WASTE TREATMENT AND DISPOSAL	Toxic and hazardous waste	Construction of incineration plant Construction of recovery plan (off site) Construction of wastewater treatment plant (off site) Construction of secure land fill facility Construction of storage facility (off iste)
	Municipal solid waste	Construction of incineration plant Construction of composting plant Construction of recovery recycling plant Construction of municipal solid waste landfill facility Construction of waste depots
	Municipal sewage	Construction of wastewater treatment plant Construction of marine outfall Night soil treatment
WATER SUPPLY	-	Construction of dams impounding reservoirs Groundwater development for industrial, agricultural or urban supplies
ENVIRONMENTAL CONSERVATION AND MANAGEMENT	Activity to remove 'designated' status from an area designated for wildlife conservation and management	Activities relating to: Wildlife conservation and management Forest conservation and management Watershed conservation and management Commercial exploitation of flora and fauna

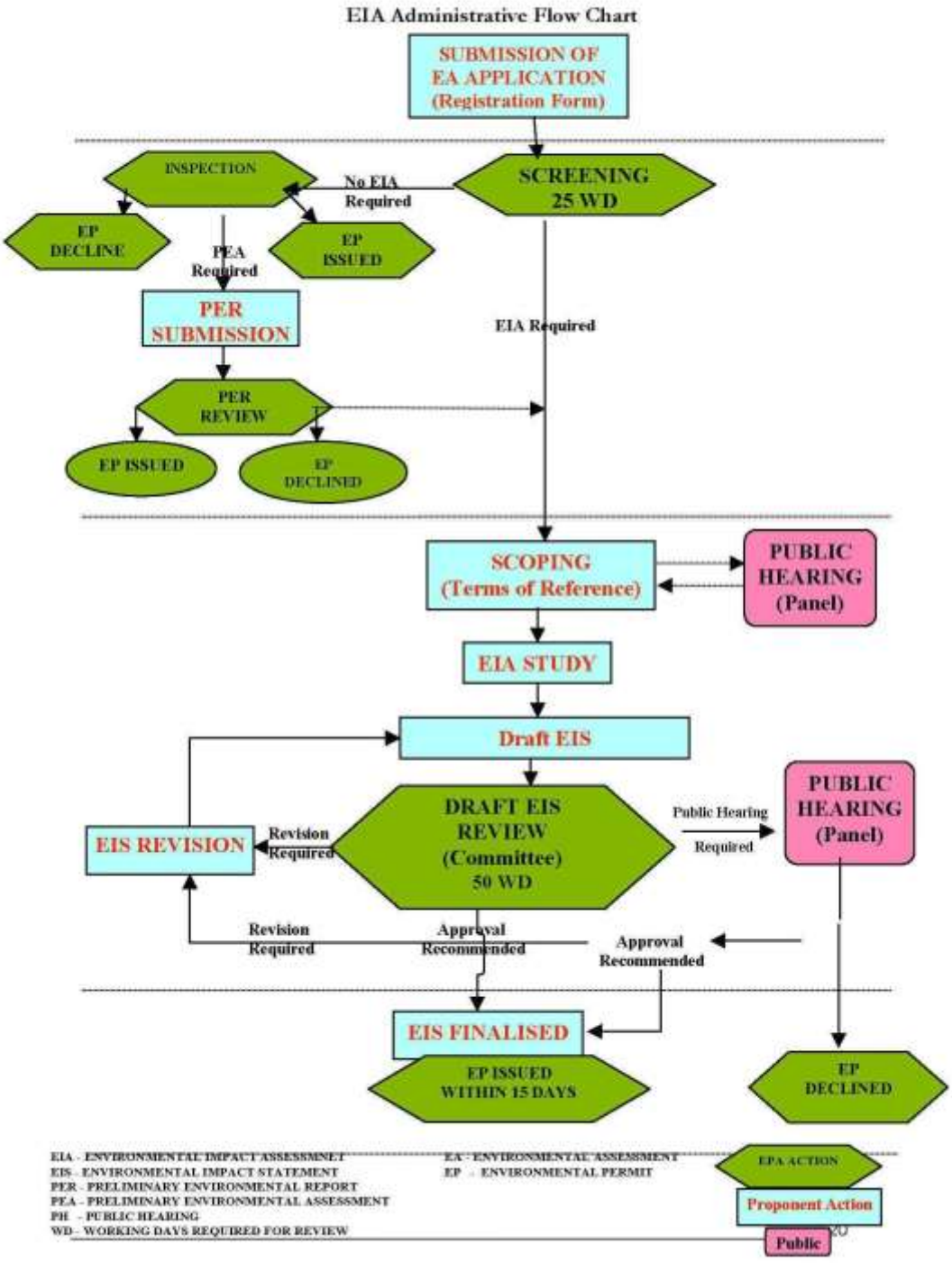
ANNEX 2:

ENVIRONMENTALLY SENSITIVE AREAS

ENVIRONMENTAL ASSESSMENT REGULATIONS, 1999 SCHEDULE 5 (Regulation 30 (2))

1. All areas declared by law as national parks, watershed reserves, wildlife reserves and sanctuaries including sacred groves.
2. Areas with potential tourist value.
3. Areas which constitute the habitat of any endangered or threatened species of indigenous wildlife (flora and fauna).
4. Areas of unique historic, archaeological or scientific interests.
5. Areas which are traditionally occupied by cultural communities.
6. Areas prone to natural disasters (geological hazards, floods, rainstorms, earthquakes, landslides, volcanic activity etc.)
7. Areas prone to bushfires.
8. Hilly areas with critical slopes.
9. Areas classified as prime agricultural lands.
10. Recharge areas of aquifers.
11. Water bodies characterized by one or any combination of the following conditions
a. water tapped for domestic purposes;
b. water within the controlled and/or protected areas; c. water which support wildlife and fishery activities.
12. Mangrove area characterised by one or any combination of the following conditions
a. areas with primary pristine and dense growth;
b. areas adjoining mouth of major river system;
c. areas near or adjacent to traditional fishing grounds;
d. areas which act as natural buffers against shore erosion, strong winds or storm floods.

ANNEX 3: ADMINISTRATIVE FLOWCHART FOR GHANA ESIA PROCEDURES



ANNEX 4:

Criteria for Environmental and Social Screening of Projects to be used by MoFA

Name of Sub-project: ……

Location of Sub-project: Region: …….. District:……

Community: ……..

Type of activity **(**new construction, Rehabilitation/Renovation, Field demonstration plots, Research programme**)**

……

Officers carrying out the screening:

Name: …… Contact: …… Designation:…….

Name: …… Contact: …… Designation: ……

Date: ……

Checklist

No	Impact area	Impact issue	Impact description	Yes	No	Don't Know
1.	Natural/ Physical resources	Environmentally /Culturally sensitive sites	Is the project site near any wetlands, rivers, cultural sites (cemeteries/shrines/groves) or is it on a slope			
		Protected areas and wildlife	Is project site near a protected area or will access road pass through protected areas (forest reserves, wildlife parks, community forests etc)			
		Natural habitats and wetlands	Is there any critical natural habitat or wetland present in the project area?			
		Flora and fauna loss	Will vegetation clearance lead to loss of exceptional flora/ fauna			
		Surface water bodies	Is there a local stream in your community or project area (less than 15 min walk)			
			Does stream(s) flow throughout the year?			
		Aquatic flora and fauna loss	Will access road and land preparation possibly carry sediments into surface water and affect aquatic life?			
		Groundwater vulnerability	Is the local water table high			
		Environmental media vulnerability to human activities	Are there human activities already impacting on environmental media (air, land, water, noise)			
		Natural hazards vulnerability, floods, soil stability/erosion	Is there a possibility of floods or soil erosion occurring?			

No	Impact area	Impact issue	Impact description	Yes	No	Don't Know
		Increased erosion risks	Do you have drains in the project area			
		Pesticide use	Will the sub-project require pesticide use?			
			Is the pesticide registered with the EPA?			
			Is the pesticide users trained in safe application and handling of agrochemical?			
		Surface water and groundwater pollution	Do you have public sanitary facilities for migrant workers?			
		Disposal of waste oil	Is there a local fuel filling station?			
		Solid waste disposal	Do you have properly designated sites for waste disposal?			
		Hazardous wastes	Any hazardous wastes such as asbestos, expired pesticides oily wastes etc among the waste streams			
2.	Social and cultural conditions	Health and well- being	Is there any HIV- AIDS education groups in the project area?			
		Gender	Are there any women groups in the project area?			
			Is there a woman leader in any group?			
			Has the contractor made arrangement to engage women as well?			
		Work for local people	Are there local people available to provide unskilled labour?			
		Community participation	Has there been any community projects previously?			
		Access of poor to community assets eg. farming opportunities	Will all sections of the project communities be able to access land			
			Will the project enhance access of poor people to farming opportunities			
		Farmlands, crops, structures, livelihoods, access to natural resources	Will the project implementation affect farmlands, standing crops, structures, community access to natural resources			

General Observations: …….

…….

…….

Recommendations: ……

…….

…….

ANNEX 5: EPA Registration Form, EA1

ENVIRONMENTAL PROTECTION AGENCY, GHANA

ENVIRONMENTAL ASSESSMENT REGISTRATION FORM

(To be completed in Duplicate)

FEE: ¢50,000

Serial No.

FORM EA1

PROPONENT:

Address for correspondence:

Contact person: Position:

Phone No.: Fax No.:

Email:

ASSESSMENT NO:		**FILE NO:**	

Environmental Protection Agency
P.O. Box M 326
Accra, Ghana

Tel: 664697/8, 664223, 662465
Fax: 662690
Email: support@epagghana.org
Web-site: www.epa.gov.gh

*This form shall be submitted to the relevant EPA Regional Office. It is important that you read carefully the guide for completing the form before starting.

1. PROPOSED UNDERTAKEN/DEVELOPMENT

Title of proposal (General Classification of undertaking)

Description of Proposal (nature of undertaking, unit processes [flow diagram], raw materials, list of chemicals (source, types and quantities), storage facilities, wastes/ by-products (solid, liquid and gaseous)

Scope of Proposal (size of labour force, equipment and machinery, installed/production capacity, product type, area covered by facility/proposal, market)

2. PROPOSED SITE

Location (attach a site plan/map)

Plot/House No. Street/Area Name

Town District/Region

Major Landmarks (if any)

Current zoning

Distance to nearest residential and/or other facilities

Adjacent land uses (existing & proposed)

Site description (immediate activities should be described)

3. INFRASTRUCTURE AND UTILITIES

Structures (buildings and other facilities proposed or existing on site)

Access to water (source, quantity)

Access to power (type, source & quantity)

Drainage provision in the project area

Nearness to water body

Access to project site:

Other major utilities proposed or existing on site(e.g. sewerage, etc)

4. ENVIRONMENTAL IMPACTS

Potential environmental effects of proposed undertaking (Both constructional and operational phases)

5. OTHER ENVIRONMENTAL ISSUES

Potential significant risks and hazards associated with the proposal (including occupational health and safety). State briefly relevant environmental studies already done and attach copies as appropriate.

6. CONSULTATIONS

Views of immediate adjourning neighbours and relevant stakeholders (provide evidence of consultation)

7. MANAGEMENT OF IMPACTS AND ENVIRONMENTAL ENHANCEMENT MEASURES

ATTACHMENTS

Tick appropriate boxes below indicating that the following required documents have been attached:

- ☐ Authentic site plan (signed by a licensed surveyor and certified by Survey Dept.)
- ☐ Block plan of the site
- ☐ Photographs of the site
- ☐ Fire report from the Ghana National Fire Service
- ☐ Zoning letter from Town & Country Planning Department

DECLARATION:

I, ……, hereby declare that the information provided on this form is true to the best of my knowledge and shall provide any additional information that shall come to my notice in the course of processing this application. I also declare that information provided is true.

Signature _____ Date _____

* Use additional sheets where spaces provided in 3, 4 and 5 are inadequate.

Annex 6 Template of Terms of Reference for ESIA

Purpose of the ESIA

The purpose of the ESIA should seek to provide adequate and appropriate information (i.e. meeting Ghana EPA and World Bank standards) for stakeholders to properly appraise the project and make an informed decision with regard to project approval and permitting.

Objectives of the ESIA

The main objectives of the ESIA study should seek to:

- Satisfy national laws and World Bank requirements with regard to environmental and social assessment procedures
- Provide adequate description of the project and identify activities of environmental/social concerns;
- Establish adequate environmental and social baseline data relevant to the project area of influence
- Identify and examine all significant environmental/social impacts during development and implementation of the project
- Provide appropriate mitigation, management and monitoring measures against potential adverse impacts and enhancement measures for potential positive impacts.

Tasks and Activities

The consultant shall realize the following:

1. Provide a detailed description of the proposed project for proper appreciation by stakeholders and the public.

   The information to be provided shall include but not limited to the following:
   - location of all project-related development sites;
   - general layout of facilities at project-related development sites;
   - pre-construction and construction activities, schedule, staffing/labour requirement, equipment/machinery, facilities and services (water supply, electricity, fuel sources); ancillary activities such as access routes, construction camps;
   - operation and maintenance activities, staffing and supporting services/facilities ; required off-site investments;
   - Project Management: contractors and consultants involved with project implementation, source of funding, estimated cost of project, client/beneficiary institution, duration of construction phase activities, plan date for commissioning of project.

2. Analyse alternative project options indicating advantages and disadvantages in relation to environmental, technical and economic feasibility.

   All alternatives to the proposed project should be considered in detail. Alternatives should include the following: the "no action option"; alternative sites; alternative designs/technology; and alternative methods of construction, including costs and reliability.

To the extent possible, the costs and benefits of each alternative shall be quantified, incorporating the estimated costs of any associated mitigating measures. The reasons for selecting the proposed project over the other alternatives shall be presented. The situation of no-action should also be considered.

3. Identify and review relevant policies, legal and institutional frameworks, at national and international levels including the World Bank Safeguard Policies, related to environmental and social aspects, identify constraints at the national implementation level and suggest recommendations.

Other relevant International conventions which Ghana is a signatory to and are relevant to the proposed project should also be included. Example conventions related to climate change, biodiversity, etc.

4. Describe in detail the physical, biological and social (including public health) environment of the project area as well as the affected and nearby communities where the project activities will be undertaken and flooding will occur due to the dam construction through both field and desktop studies.

The baseline on the natural environment shall include flora, fauna, sensitive areas or habitats e.g., rivers/wetlands/forest reserves, rocky/sandy areas, relief and drainage, water quality, fisheries, air quality, climate and meteorology, noise levels, geology, soils, and significant pollutant sources in the area.

The baseline socio-economic/cultural environment shall include general data related to the project catchment on: population; land use; planned development activities; community structure; land ownership, land use and tenure, economic activities, employment levels/occupation, distribution of income, goods and services ; recreation; public health; education; cultural properties (e.g., archaeological and historically significant sites); customs, aspiration and attitudes.

This is necessary to establish background information in determining any future impacts during project implementation to identify very vulnerable areas needing special environmental/social management considerations.

5. Assess the potential environmental and social impacts related to project activities and recommend adequate mitigation and management measures. The impacts from changes brought about by the project on the relevant baseline environmental and social conditions should be assessed.

The project area of influence should be clearly established. This should cover the geographical area of influence, environmental medium of influence, institutional influence, socio-economic and community influence. Where possible these influences shall be illustrated with appropriate maps.

The assessment shall distinguish between significant positive and negative impacts, direct and indirect impacts, impact duration (temporary and permanent), extent of impact (local or regional or trans-boundary), intensity or magnitude of impact (strong/high, average/medium, weak/minimal),

impact severity (major, moderate or minor) and cumulative impacts in relation to other components of the project.

The study shall also include potential positive/beneficial impacts such as the project's contribution to environmental quality by making cleaner power more available for energy production; potential for fishing and tourism prospects among others.

From the assessment of impacts, the necessary mitigation and management actions should be prescribed and wherever possible alternative design or technology or implementation programmes should be proposed or recommended accordingly.

6. Develop an environmental monitoring plan for residual environmental and social impacts and baseline parameters for verification of the effectiveness of the proposed mitigation measures for both construction and operation phases of project implementation. The plan should include costs, monitoring parameters, frequency, locations, responsibilities as well as training and institutional strengthening requirements needed to implement the monitoring programme successfully.

7. Develop a Provisional Environmental Management Plan for the project.

The provisional EMP should include (i) environmental, safety and social policy objectives to guide project implementation, (ii) the institutional responsibilities for implementation and the various roles of the contractor and engineering consultant should be clear; (iii) the monitoring, review and auditing requirements or indicators; (iv) action plans for environmental, social and safety issues; (v) the costs of activities; (vi) the calendar of implementation, (vii) training programmes or requirements, (viii) management reviews and environmental auditing requirements, and (viii) emergency response measures being put in place during construction and operation phases

The Environmental Management Plan should also include activities intended to enhance the environmental, safety and socio-economic aspects of the project.

8. Develop a provisional decommissioning plan that will serve as a guide during project decommissioning for both construction and operation phases of the project

9. Identify and engage relevant stakeholders and the public to ensure that there is clear understanding of the project and the potential impacts and solicit their inputs, comments, concerns, expectations and suggestions for successful project implementation and include contacts of people or groups engaged in the report.

Reporting

The expected reports of the assignment are

1. Scoping Report and Terms of Reference for the ESIA Study; and
2. ESIA Report

Reporting Format

The Scoping Report shall include:

(a) Cover Page
(b) Table of Contents;
(c) List of Tables, Figures, Plates;
(d) Introduction;
(e) Proposed Project Description;
(f) Alternative Considerations;
(g) Relevant Legal and Institutional Framework for the Project;
(h) Brief Description of Environmental and Social Baseline Conditions;
(i) Public Consultations and Involvement Process;
(j) Project Area of Influence and Potential Environmental/Social Issues Identified;
(k) Preliminary Assessment of Potential Impacts and Mitigation Measures;
(l) Terms of Reference for the ESIA;
(m) Conclusion;
(n) List of References; and
(o) Appendices.

The ESIA Report shall include:

a) Cover Page
b) Table of Contents;
c) List of Tables, Figures, Plates;
d) An Executive Summary;
e) Introduction;
f) Proposed Project Description;
g) Alternative Considerations;
h) Relevant Legal and Institutional Framework for the Project
i) Description of Environmental and Social Baseline Conditions;
j) Public Consultation and Involvement Process;
k) Assessment of Potential Environmental and Social impact;
l) Proposed Mitigation and Management Measures;
m) Environmental Monitoring Plan;
n) Provisional Environmental Management Plan;
o) Provisional Decommissioning Plan;
p) Conclusion;
q) List of References; and
r) Appendices.

Copies of Report

The number of copies of report to be submitted should be in line with the EPA requirements. The consultant should also be mindful of submission of draft reports to the client for review.

Expertise Required

The ESIA core team should at least include Environmental Assessment Specialist, Social impact assessment specialist, Environmental Quality Specialist, Terrestrial ecologist, Aquatic biologist, Hydrologist, and Civil Engineer. The experts shall have minimum qualification of a post-graduate degree with at least 5 years post-graduation working experience in conducting Environmental and Social Impact Assessment of projects in the agribusiness and water subsectors. Knowledge of World Bank Safeguard policies is essential.

Duration of Assignment

The consultant will be required to undertake the assignment as determined by the client.

Facilities to be provided by the Client

The consultant shall be provided with copies of this ESMF and any other document on the project such as the project feasibility study report considered relevant for a successful completion of a high quality assignment.

Schedule of Payment to Consultants

Payments shall be linked to:

- Signing of contract
- Submission of Scoping Report
- Submission of draft ESIA Report
- Submission of final ESIA Report
- Receipt of EPA Permit by the client

ANNEX 7: STAKEHOLDER CONSULTATIONS AND FIELD/SITE PICTURES

A: List of stakeholders contacted

No.	Name	Designation/ Institution	Contact No.
1	Mrs Azara Ali-Mamshie	Project Coordinator –WAAPP, MOFA, Accra	0277403985
2	Dr. Alphonsus Belane	Technical Expert, WAAPP, MOFA, Accra	0203187606
3	Mr. Augustine Oppong Danquah	M&E Officer, WAAPP, MOFA Accra	0208190692
4	Mr. Emmanuel Agyei Odame	Deputy Director – Field Services, Directorate of Agricultural Extension Services (DAES), MOFA, Accra	0265330862
5	Mr. George Prah	Deputy Director, Directorate of Crops Services (DCS), MOFA, Accra	0244897314
6	Kingsley Kwaku Amoako	Envt, Land and Water Management Unit, DCS, MOFA, Accra	0244599596
7	Dr. Joseph Awuni	Deputy Director & Head, Accra Vet. Lab., Veterinary Services Directorate, MOFA, Accra	0208116397
8	Mr. Joseph Edmund	Deputy Director, EPA, Accra	0501301396
9	Mr. Ogbamey Tetteh	Station Master, Asuansi Agric Research Station	0540274836
10	Samuel Abubakar Bawa	Station Manager, Asuansi Agricultural Research Station	0244946406
11	Abass Mohammed	Station Manager, Ashanti Mampong Agricultural Research Station	0200513020
12	Mr. Isaac Owusu Mensah	Town & Country Planning Officer, Town & Country Planning Department of the Ashanti Mampong Municipal Assembly	0244036902

B: Summary of stakeholder discussions

Stakeholder/ Date of engagement	Project discussions, issues, challenges and suggestions
WAAPP PCU -Project Coordinator -M&E Officer -Technical Expert 13/02/18 and 14/02/18	Proposed Project/ WAATP -Rehabilitation of two agricultural stations at Asuansi in the Central Region and Ashanti Mampong. -Renovation of two veterinary quarantine stations at Bawku and Ho. -Rehabilitation of two seed centres at Bolgatanga and Wa in the Upper East and Upper West Regions respectively. -Rehabilitation of warehouses. -Rehabilitation/renovation works will focus on existing structures at the stations/centres. -WAATP expected to be category B Projects. -Getting the land documents for the existing stations is key to avoid land acquisition issues. -The World Bank requires a Safeguard Officer to be recruited for the WAATP. MOFA facilities -No new land acquisition expected for existing facilities. -Likely seed processing units to be constructed at Ejura/Nkoranza will require land acquisition. WAAPP -*WAAPP Projects*: Agric stations at Wenchi, Babile and Kpeve were rehabilitated under WAAPP. Paga quarantine station was also renovated. -Construction of biotechnology laboratory, Agribusiness incubation centre at Pokuase and construction of Abattoir at Animal Research Institute at Frafraha in the Gt. Accra Region. -*Handling of safeguard Issues:* EPA directly handled safeguard issues under WAAPP. -MMDAs were key stakeholders and were involved with the implementation of WAAPP. -Piloted some greenhouse activities under WAAPP. -*EPA Permits/EIA*: EPA permit was obtained for the Animal research slaughter house, and EIA done for the Agribusiness incubation centre at Pokuase. -During rehabilitation works under WAAPP, there was alternative arrangement for staff at the stations to function and such arrangement may have to be under WAATP if necessary. -*Pesticides*: Beneficiary farmers with farms above 50 ha, were sensitized on how to use pesticides and how to dispose pesticide containers. -*Training*: Training workshop organised for stakeholders including WAAPP PCU, MMDAs. Some environmental/social challenges associated with WAAPP for WAATP lessons -Sale of farmers' farmlands to estate developers by landlords, especially in the Gt. Accra Region and Kumasi areas. -Disposal of asbestos materials -Identifying sub-projects that have potential impacts on the environment, e.g. Agribusiness incubation centre, which eventually required an EIA. -Disposal of wastes from the Animal Research guinea fowl slaughter house due to settlements around the place. -Encroachment of existing MOFA facilities/lands at Animal Research Institute farm fields/plots in Accra, Wench Station. -The Agricultural Research/Veterinary Stations are not properly secured or walled/fenced. -Some beneficiary farmers had issues with Fulani herdsmen especially at Agogo and Konongo. -There was no environmental/social safeguard specialist with the WAAPP PCU. Recommendations for WAATP -Beneficiary farmers with 40 ha or more should be trained in the WAATP PMP. -Training should be organised for processors. E.g. cassava processors with regard to

Stakeholder/ Date of engagement	Project discussions, issues, challenges and suggestions
	proper disposal of wastewater and management of odour. -Need to identify handicap farmers/people, single mothers with children for inclusion under WAATP. -Landlords of participatory farmers should be educated not to sell or give away specific lands allocated for farming/WAATP to estate developers.
Deputy Director – Veterinary Services 14/02/18	-Ho veterinary station has no quarantine services. -Bawku Veterinary quarantine station: staff quarters and clinic needs rehabilitation. Watering points not properly functioning. -Rehabilitation works at Bawku may not affect operations. -Bawku station was fenced but fence is damaged. -Fulani herdsmen patronise the Bawku station and the station generates revenue from their patronage. -Under WAAPP, landowners for the Hamile station claimed no compensation was paid for the station land and so were not cooperating. -Need for vet supplies for the vet stations. -*Waste disposal:* Not too much wastes generated at the vet stations. Wastes such as syringes, cotton etc are burnt in the open. Animal waste and cow dung are used for composting. -*Disposal of dead animals*: Deep burial for dead animals are carried out. -There are land encroachment issues associated with vet stations. -Quarantine is for a minimum of 14 days by which any disease is expected to show up. -During rehabilitation work, no animals are allowed at the station. <u>Sustainability Issues and Suggestions</u> -*Revenue:* The vet stations charge for services rendered. The Paga vet station rehabilitated under WAAPP is now generating a lot of revenue. -*Water resources:* Watering points are provided at the vet stations e.g. ponds and dugouts. -*Staffing:* Is a major challenge due to inadequate employment of new staff. -Safety/security: Fencing of vet stations is very important to prevent encroachment and containment of animals. -Pasture development should be considered at vet stations.
EPA, Deputy Director at the CCMC 15/02/18	-There was an ESMFP prepared for the WAAPP (for Ghana and two other West African French speaking countries) by a French Consultant. -The EPA prepared an EMP to guide the Ghana WAAPP implementation and a checklist to screen the subproject. Used a workshop to develop a checklist. -Did training for the WAAPP stakeholders including Agric Extension Services, CSIR, MMDAs etc. -Extension services officials were involved with the screening exercise for sub-projects. -Did guidelines for the pesticide use. -After screening, the EPA assist with evaluation and advise on which ones to register using the Form EA 1. -Training programme is budgeted for by the EPA for WAAPP. -Regional EPA officers were involved with the training but unfortunately not with the screening. -Issues of asbestos disposal came up at Kpeve in the Volta Region. -EPA should be contacted or involved with hazardous material disposal. <u>Recommendations for WAATP</u> -The safeguard officer should go to the field with the M&E team. -Every subproject or activity under WAATP should be screened before it starts. -Final advise on screening should be done by the EPA.

Stakeholder/ Date of engagement	Project discussions, issues, challenges and suggestions
	-Proper MOU arrangements for either cash or in-kind compensation should be put in place for farmers whose fields or plots are used for demonstration purposes. -There should be a budget for compensation under WAATP.
Deputy Director, Agric Extension Services, Accra 15/02/2018	<u>Good environmental and agricultural practices</u> -Do not cultivate near streams. Observe buffer zones which will take care of siltation issues. -Do not cultivate near schools, so that spraying of pesticides do not get to school pupils by wind. -Cultivation on hills must be on the contour to minimise erosion. -Farmers should be educated never to test pesticides using their tongues before using or applying them. -Farmers should be educated and trained in how to use PPEs and should be educated not to apply pesticides when not in the appropriate PPEs. -Under WAAPP, farmers contributed land for the project, district MOFA negotiated with such farmers on beneficiary or in-kind compensation arrangement on how to share the produce from the farmers plots. The sharing arrangement was 60% to farmers and 40% to MOFA. -MOFA also supported such farmers with planting materials. Such arrangements were to be a win-win situation and farmers were expected to agree. -Women farmers also provide farmlands for the demonstration farms. -Beneficiary communities were expected to provide 1 acre farm for the demonstration plots, and it was expected that the 1 acre demonstration plot will yield planting materials to take care of 15 acre farm. <u>Challenges</u> -Slush and burning used by farmers to clear lands. -Estate developers taking over farmlands. -Most farmers are tenant farmers and do not owe the farmlands or have proper documentation for the farmlands.
Deputy Director, Crops Services and Env't, Land and Water Management Unit 16/02/2018	-Crop research is done at the agric stations. -Built capacity of district/ regional extension officers. -The Extension Service Directorates transfer technology, information to farmers. <u>Agric stations</u> -The Asuansi and Ashanti Mampong Agric stations have not seen renovation for a long time. -Rehabilitation of the stations will not affect current operations of the stations. Under WAAPP during rehabilitation of the Wenchi station, staff were relocated to town and similar arrangements can be made where necessary for the stations to be rehabilitated under WAATP. -Disposal of asbestos roofing materials at Kpeve became an issue under WAAPP. -Encroachment of research lands at Ashanti Mampong is a major issue at the moment, with buildings being developed on the plots. -The traditional authorities are involved with giving out the lands to people and have indicated their intention to relocate the research station from its current location. -*Security:* Under WAAPP, Wenchi and Babile stations were partly fenced, but Kpeve was not fenced. -Currently, agric stations are non-residential. -Under WAAPP, the Crop Services Directorate were: • Involved with the multiplication of planting materials • Involved with the establishment of climate smart learning sites • Facilitate release of new crop varieties

Stakeholder/ Date of engagement	Project discussions, issues, challenges and suggestions
	• Involved with the implementation of the seed policy Suggestions -Mampong research station should be fenced to protect lands from encroachment. -All other stations should be fenced if possible to prevent future encroachment or discourage ongoing encroachment. -Need for residential facilities, conference rooms to be developed as part of the agric stations to help with research training programmes.
Asuansi Agric Research Station, 28/02/18	History -The Agric station was built in 1904, and is located on a 1mile square land area. -There is currently a Farm Institute (constructed in 1954) and a Technical Institute (constructed in 1945) situated on the agric station lands. Facilities The station has office block (in use) and stores (in use), a guest house (in use by the station manager), manager's bungalow (not in use), labourers' quarters (partly in use), technical staff/artisan quarters (partly in use), learners quarters (not in use), storage/warehouse (not in use), carpentry shop (not in use), mechanical shop (not in use), canteen facilities (partly in use), and a clinic (in use). The structures look very old and dilapidated even though some of such structures are still being used in spite of the challenges. Some of the roofing materials are asbestos. There is no changing roof facility at the station. Encroachment Issues The station is not encountering any serious encroachment on its land. Under the NARP, about 1600m of wire mesh fence was installed at the Nyamedom community area where residents had wanted to put up structures on the station lands. -Minor encroachment do occur relating to some farmers extending their farms beyond unfenced section of station boundaries. Toile facilities -The labourer quarters do not have any toilet facilities after the pan latrines were decommissioned. -The toilets at the artisan quarters not functioning or not in use. -The technical staff quarters do not have adequate toilet facilities. The existing KVIP toilet facilities are shared by the various quarters which are located at different places, and as a result quarters not close to the facility, do not use it especially during the night. Waste disposal -There is no central disposal site for wastes. Open burning of wastes is carried out. Water Supply and Water Resources -The station taps into the CWSA Small Towns water supply system at Nyamedom community. Currently, the water supply is not extended to the quarters/ residential areas. -The buildings were all designed to harvest rainwater for storage in reservoirs for use. -The Kakum River which is damned at Brimsu to supply raw water for treatment and distribution to the Cape Coast township passes through the station property. -Rainwater and the Kakum River were the sources of water (including drinking) for the station before the CWSA water project at Nyamedom. Electricity supply -There is electricity supply. No major complaints with the supply. -No streetlights at all the quarters. The only streetlight is sited at the clinic. Security -The station is not well-lit in the night and appears dark. -There is no night watchman or security person.

Stakeholder/ Date of engagement	Project discussions, issues, challenges and suggestions
	Suggestions -Need to supervise contractor to ensure that he does not paint and reuse parts of any dilapidated material from the existing buildings. -Need to observe proper buffer zone around the Kakum river to minimise pollution via sediment transport. -Need to improve security and lighting at the station. -Proper waste disposal site required and provision of toilet facilities at all the quarters needed.
Ashanti Mampong Agric Research Station	Land size and owners -Station land property is about 405 acres. -The station lands belongs to two communities, namely Mampong and Jetiase. Facilities -An office block (in use), a guest house, a manager's bungalow (in use), 11no. staff quarters(partly in use), and an old structure previously used for poultry production (not in use), a greenhouse facility (newly constructed but not yet in use) *Encroachment:* Is a major challenge and is almost getting out of hand. A greater portion of the research fields have been sold out as residential plots by the Mampong traditional authorities. People who have bought the lands are removing the agric station cashew and mango plants for the construction of their buildings. -Inability to trace the land acquisition documents by the Lands Commission has aided the selling of the station lands by the Mampong traditional authorities. -In view of the sale of the lands by the Mampong TAs, the Jetiase community also want to collect its land. -In adequate toilet facilities at the staff quarters. *Waste disposal*: No central dump site available at the station for waste disposal. Open burning is carried out. *Water supply and water bodies*: There is potable water supply to the station. There is a stream (with an old and weak small dam on it) traversing the station lands. Suggestions The government/MOFA must act on the encroachment now. Otherwise the rehabilitation of the Mampong station under WAATP will not be a prudent undertaking because there will not be any land or fields for research work.
Town & Country Planning Department of the Ashanti Mampong Municipal Assembly 1/03/18	-The Department has done a new layout for the Agric station lands even though it is yet to rezone the area. -The Department is aware of the encroachment of the station lands and the sale of the lands by the Mampong traditional authorities. -Though the Department is not in favour of the encroachment, the lack of land acquisition documents from MOFA is not helping matters. -Suggests a multi-stakeholder field visit to the station site to see if undeveloped lands can be salvaged before it is too late.

C: Field/ Site Pictures

ENCROACHMENT AT ASHANTI MAMPONG AGRIC STATION

Sandcrete blocks on sold plots at the station mango farms

Sandcrete blocks on sold plots near staff quarters

Construction of a building at the station cashew farm

Some structures under various stages of development on the Mampong station land

ASUANSI PICTURES

Labourers' quarters (left) and labourers' kitchen (right)

A Technical staff quarters

Station Manager's bungalow

An Artisanal quarters

Office block

Annex 8: General Environmental Management Conditions for Construction Contracts

General

1. In addition to these general conditions, the Contractor shall comply with any specific Environmental Management Plan (EMP) or Environmental and Social Management Plan (ESMP) for the works he is responsible for. The Contractor shall inform himself about such an EMP. and prepare his work strategy and plan to fully take into account relevant provisions of that EMP. If the Contractor fails to implement the approved EMP after written instruction by the Supervising Engineer (SE) to fulfil his obligation within the requested tune, the Owner reserves the right to arrange through the SE for execution of the missing action by a third party on account of the Contractor
2. Notwithstanding the Contractor's obligation under the above clause, the Contractor shall implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in an EMP. In general these measures shall include but not be limited to.
   a) Minimize the effect of dust on the surrounding environment resulting from earth mixing sites, vibration equipment, temporary access roads, etc.to ensure safety, health and the protection of workers and communities living within the vicinity dust producing activities.
   b) Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e g. excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.
   c) Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels is maintained and or re-established where they are disrupted due to works being carried out.
   d) Prevent oils, lubricants and waste water used or produced during the execution of works from entering into rivers, streams, irrigation channels and other natural water bodies reservoirs, and also ensure that stagnant water in uncovered borrow pits is treated to the best way to avoid creating possible breeding grounds for mosquitoes.
   e) Prevent and minimize the impacts of quarrying, earth borrowing, piling and building of temporary construction camps and access roads on the biophysical environment including protected areas and arable lands; local communities and their settlements. In as much as possible restore /rehabilitate all sites to acceptable standards.
   f) Upon discovery of ancient heritage, relics or anything that might or believed to be of archaeological or historical importance during the execution of works, immediately report such findings to the SE so that the appropriate authorities may be expeditiously contacted for fulfilment of the measures aimed at protecting such historical or archaeological resources.
   g) Discourage construction workers from engaging in the exploitation of natural resources such as hunting; fishing, and collection of forest products **or** *any* other activity that might have a negative impact on the social and economic welfare of the local communities
   h) Implement soil erosion control measures in order to avoid surface run off and prevents siltation, etc.
   i) Ensure that garbage, sanitation abd drinking water facilities are provided in construction workers camp**.**
   j) Ensure that, in as much as possible, local materials are used to avoid importation of foreign material and long distance transportation.
   k) Ensure public safety, and meet traffic safety requirements for the operation of work to avoid accidents,
3 The Contractor shall indicate the period within which he/ she shall maintain status on site after completion of civil works to ensure that significant adverse impacts arising from such works have been appropriately addressed.
4 The Contractor shall adhere to the proposed activity implementation schedule and the monitoring plan/ strategy to ensure effective feedback of monitoring information to project management so that impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.
5 Besides the regular inspection of the sites by the SE for adherence to the contract conditions and specifications, the Owner may appoint an Inspector to oversee the compliance with these environmental conditions and any proposed mitigation measures. State environmental authorities may carry out similar inspection duties. In all cases, as directed by the SE. the Contractor shall comply with directives from such inspectors to implement measures required to ensure the adequacy rehabilitation measures carried out on

the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.

Worksite/Campsite Waste Management

6 All vessels (drums, containers, bags, etc.) containing oil/ fuel/ construction materials and other hazardous chemicals shall be bunded in order to contain spillage. All waste containers, litter and any other waste generated during the construction shall be collected and disposed off at designated disposal sites in line with applicable government waste management regulations.

7 All drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations.

8 Used Oil from maintenance shall be collected and disposed-off appropriately at designated sites or be re-used or sold for re-use locally.

9. Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.

10. Construction waste shall not be left in stockpiles along the load, but removed and reused or disposed of on a daily basis.

11. If disposal sites for clean spoil are necessary, they shall be located in areas, approved by the SE. of low land use value and where they will not result in material being easily washed into drainage channels. Whenever possible, spoil materials should be placed in low-lying areas and should be compacted and planted with species, indigenous to the locality.

Material Excavation and Deposit

12. The Contractor shall obtain appropriate license/ permits from relevant authorities to operate quarries or borrow areas.

13. The location of quarries and borrow areas shall be subject to approval by relevant local and national authorities, including traditional authorities if the land on which the quarry or borrow areas fall in traditional laud

14. New extraction sites:

a) Shall not be located in the vicinity of settlement areas, cultural sites, wetlands or any other valued ecosystem component, or on high or steep ground or in areas of high scenic value, and shall not be located less than 1km from such areas.

b) shall not be located adjacent to stream channels wherever possible to avoid siltation of river channels where they are located near water sources, borrow pits and perimeter drains stall surround quarry sites.

c) shall ret be located In archaeological areas, Excavations in the vicinity of such areas shall proceed with great care and shall be done in the presence of government authorities having a mandate for their protection.

d) shall not be located in forest reserves, However, where there are no other alternatives, permission shall be obtained from the appropriate authorities and an environmental impact study shall be conducted.

e) shall be easily rehabilitated, Areas with minimal vegetation cover such as flat and bare ground, or areas covered with grass only or covered with shrubs less than 1.5m in height; are preferred.

f) shall have clearly demarcated and marked boundaries to minimize vegetation clearing.

15. Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.

16. Stockpile areas shall be located in areas where trees can act as buffers to prevent dust pollution. Perimeter drains shall be built around stockpile areas. Sediment and other pollutant traps shall be located at drainage exits from workings.

17. The Contractor shall deposit any excess material in accordance with the principles of these general conditions, and any applicable EMP, in areas approved by local authorities and or the SE

18. Areas for depositing hazardous materials such as contaminated liquid and solid materials shall be approved by the SE and appropriate local and/or national authorities before the commencement of work. Use of existing, approved sites shall be preferred over the establishment of new sites.

Rehabilitation and soil Erosion Prevention

19, To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is

similar to the rate of construction.

20, Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.

21, 21. Topsoil shall not be stored us large heaps. Low mounds of no more than 1 to 2m high are recommended.

22, Re-vegetate stockpiles to protect the soil from erosion, discourage weeds and maintain an active population of beneficial soil microbes.

23, Locate stockpiles where they will not be disturbed by future construction activities.

24, To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired.

25, Remove toxic materials and dispose of them in designated sites. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute groundwater and soil.

26, Identify potentially toxic overburden and screen with suitable material to prevent mobilization of toxins.

27, Ensure reshaped land is formed so as to be inherently stable, adequately drained and suitable for the desired long-term laud use. and allow natural regeneration of vegetation.

28, Minimize the long-term visual impact by creating landforms that are compatible with the adjacent landscape.

29, Minimize erosion by wind and water both during and after the process of reinstatement.

30, Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.

31, Re-vegetate with plant species that will control erosion, provide vegetative diversity and. Through succession, contribute to a resilient ecosystem. The choice of plant species for rehabilitation shall be done in consultation with local research institutions, forest department and the local people.

Water Resources Management

32, The Contractor shall at all costs avoid conflicting with water demands of local communities.

33, Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the relevant Water Authority.

34, Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.

35, Temporary damming of streams and rivers shall be done in such a way to avoid disrupting water supplies to communities downstream and maintains the ecological balance of the river system.

36, No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.

37, Wash water from washing out of equipment shall not be discharged into water courses or road drains.

38, Site spoils and temporary stockpiles shall be located away from the drainage system, and surface runoff shall be directed away from stockpiles to prevent erosion.

Traffic Management

39, Location of access roads/ detours shall be done in consultation with the local community especially in important or sensitive environments. Access roads shall not traverse wetland areas.

40, Upon the completion of civil works, all access roads shall be ripped and rehabilitated.

41, Access roads shall be sprinkled with water at least five times a day in settled areas, and three times in unsettled areas, to suppress dust emissions.

Disposal of Unusable Elements

42 Unusable materials and construction elements such as electro-mechanical equipment, pipes, accessories and demolished structures will be disposed of in a manner approved by the SE. The Contractor has to agree with the SE which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.

43. As far as possible, abandoned pipelines shall remain in place. Where for any reason no alternative alignment for the new pipeline is possible, the old pipes shall be safely removed and stored at a safe place to be agreed upon with the SE and the local authorities concerned.

44 AC-pipes as well as broken parts thereof have to be treated as hazardous material and disposed of as specified above.

45. Unsuitable and demolished elements shall be dismantled to a size fitting on ordinary trucks for transport.

Hearth and Safety

46. In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign Workers and local residents shall be sensitized on health risks particularly of AIDS.
47. Adequate road signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points.
48. Construction vehicles shall not exceed maximum speed limit of 40km per hour.

Repair of Private Property

49. Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.

50 In cases where compensation for inconveniences, damage of assets etc. are claimed by the owner, the Client has to be informed by the Contractor through the SE. This compensation is in general settled under the responsibility of the Client before signing the Contract. In unforeseeable cases, the respective administrative entities of the Client will take care of compensation.

Contractor's Health, safety and Environment Management Plan (HSE-MP)

51 After signing the contract, the Contractor shall prepare an EHS-MP to ensure the adequate management of the health, safety environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works The Contractor's EHS-MP will serve two

- For the Contractor, for internal purposes, to ensure that all measures are in place for adequate HSE management, and as an operational manual for his staff.
- For the client support where necessary by a SE, to ensure that the contractor is fully prepared for the adequate management of the HSE aspects of lie project, and as, a basis for monitoring of the contractor's HSE performance.

52 The contractor's EHS-MP shall provide at least:

- a description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an EMP;
- a description of specific mitigation measures that will be implemented in order to minimize adverse impacts,
- a description of all planned monitoring activities (e g. sediment discharges from borrow areas) and the reporting thereof; and
- the internal organisational management and reporting mechanisms put in place for such.

53 The Contractor's EHS-MP will be reviewed and approved by the Client before start of the works. This, review should demonstrate if the Contractor's EHS-MP covers all of the identified impacts, and has defined appropriate measures to counteract any potential impacts.

Training of Contractor's Personnel

53. The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project EMP, and his own EHS-MP and .are able to fulfil their expected roles and functions. Specific training should be provided to those employees that have particular responsibilities associated with the implementation of the EHS-MP.

    General topics should be:

    - HSE in general (working procedures),
    - emergency procedures, and
    - social and cultural aspects (awareness raising on social issues)

Cost of Compliance

54. It is expected that compliance with these conditions is already part of standard good workmanship and state of art as generally required under this Contract. The item "Compliance with Environmental Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable HSE impact.

55. Example Format HSE Report

Contract:
Period of reporting:
HSE management actions/measures:
Summarize HSE management actions/measures taken during period of reporting, including planning and management activities (e.g. risk and impact assessments), HSE training, specific design and work measures taken, etc.

HSE incidents:
Report on any problems encountered in relation to HSE aspects, including its consequences (delays, costs) and corrective measures taken. Include relevant incident reports.
HSE compliance:
Report on compliance with Contract HSE conditions, including any cases of non-compliance.

Changes:
Report on any changes of assumptions, conditions, measures, designs and actual works in relation to HSE aspects.
Concerns and observations:
Report on any observations, concerns raised and/or decisions taken with regard to HSE management during site meetings and visits
Signature (Name, Title Date):
Contractor Representative
Example Format: HSE incident Notification
Provide within 24 hrs to the Supervising Engineer
Originators Reference No:
Date of incident: **Time:**
Location of incident:
Name of Person(s) involved:
Employing Company. Type of incident:
Description of Incident:
Where, when, what, how, who, operation in progress at the time (only factual)
Immediate Action:
Immediate remedial action and actions taken to prevent reoccurrence or escalation
Signature (Name, Tittle, Date):
Contractor Representative