

**ENVIRONMENTAL
MANAGEMENT PLAN- WEST
AFRICA CENTRE FOR CROP
IMPROVEMENT (WACCI)
BUILDING**

EXECUTIVE SUMMARY

The West Africa Centre for Crop Improvement (WACCI), a beneficiary of the World Bank-Africa Centre of Excellence Project, has commissioned the construction of a multipurpose building to become the hub of operations for the Centre going forward. The \$2.4 million project is expected to be completed in 15 months.

The Physical Development and Municipal Services Directorate (PDMSD) of the University of Ghana has prepared this document to track and monitor the activities of the contractor executing this project. It is expected that by adhering to the guidelines and instructions in this document, regulations and codes for the building project and related construction activities will be observed. Compliance with the Environmental Management Plan (EMP) is expected to lead to an environmentally sustainable project, which will have minimal impact on the health and safety of the immediate community to be affected by the project.

The document contains stated responsibilities and responsible individuals who will be held accountable at all times during the delivery of the project.

1.0 INTRODUCTION

The Environmental Health Service Unit (EHSU) is a unit of the Physical Development and Municipal Service Directorate (PDMSD) at the University of Ghana. The focus of EHSU is to protect the health of the population of the University community by controlling and preventing factors in the environment which may cause ill health or reduced quality of life. Enforcement of legislation in relation to environmental and lifestyle determinants of health is a central part of our role. This Environmental Management and Monitoring Plan will ensure sound environmental practices during the various stages of construction of the West Africa Centre for Crop Improvement (WACCI) Building, which includes:

- ✓ **Pre-Construction phase**, the vegetation (grass) clearing to make way for the construction will be monitored
- ✓ **Construction phase**, Public Health, Occupational Health and Safety issues, Air quality, Noise, and Traffic impacts will be monitored
- ✓ **Occupancy phase**, the effects to be monitored would incorporate the following: solid waste administration, liquid waste administration, and run-off administration

1.1 Environmental Management Plan

This section outlines a provisional environmental management plan that will ensure sound environmental practices during the various stages of the project. It discusses and allocates appropriate resources for items discussed under mitigation and monitoring. Issues relating to procedures for the management of unexpected changes as a result of the implementation of the project are also addressed in this section.

WACCI, a beneficiary of the World Bank Africa Centres of Excellence grant will engage a qualified contractor through a National Competitive Tendering to implement the construction phase activities of the project. In order to achieve the environmental management goals for the project, among other objectives, WACCI will constitute a Project Implementation Team (PIT) to be chaired by the Acting Director of PDMSD. The Project Manager who is directly in charge of the WACCI Building Project will be a member of the team, and will report directly to the Director of WACCI. This will ensure that environmental considerations of issues and their costs

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are factored into proposed activities and their budgets. The PIT will coordinate and oversee site construction activities and ensure the monitoring of specific environmental criteria. The occupancy and maintenance phase will be managed by WACCI.

This temporary Environmental Management Plan talks about rules and regulation of University of Ghana's convention on Noise, Public wellbeing and Safety and Sanitation

1.2 Environmental Management Structure

The Project Implementation Team, on Environmental, Health and Safety issues headed by the Head, Environmental Unit of the PDMSD, shall facilitate the ecological sustainability aspect of the project. The project implementation team shall be responsible for all environmental issues at the construction phase of the project, and shall comprise the project manager, the project coordinator and the procurement specialist.

Management of environmental issues at the occupancy and maintenance phase shall be incorporated into the Environmental Management Plan, to be administered by the School Administration.

1.3 Functions of PIT

The functions of the Project Implementation Team shall include:

- ✓ Ensuring project compliance with all pertinent environmentally friendly, health and safety regulations
- ✓ Liaising with all relevant regulatory bodies and organizations – EPA, Ghana National Fire Service, etc., to ensure compliance with all local government authority requirements
- ✓ Formulating and reviewing environmental, health and safety policies and practices, as well as social matters associated with the project
- ✓ Assisting in the education and training of project staff on environmental, social and safety awareness
- ✓ Making budgetary provision for project environmental programmes
- ✓ Undertaking environmental and social monitoring activities for the project

The head of the Project Implementation Team shall have the following responsibilities, among others:

- ✓ Monitoring all environmental programmes for pre-construction and construction phases of the project, including those related to bio-physical and socio-economic/cultural components
- ✓ Working closely with construction gangs to ensure that all monitoring and mitigation guidelines recommended for the project are strictly adhered to during the various phases. This will include following all health and safety guidelines outlined
- ✓ Organizing activities to motivate and maintain the interest of project staff and home owners in environmental issues
- ✓ Coordinating investigations on all types of accidents
- ✓ Conducting environmental audits in accordance with project monitoring guidelines;
- ✓ Producing the relevant environmental reports covering the project
- ✓ Working closely and coordinating efforts with the EPA and other enforcement bodies to ensure full compliance with all legal and regulatory requirements
- ✓ Establishing and running a reporting system on progress (or otherwise) in implementing mitigation measures (including contractor's obligation), training etc.

1.4 General Health and Safety Procedures

The guidelines provided in the Factories, Offices and Shops Act, 1970 (Act 328) shall be strictly complied with at the Construction, Operation and Maintenance phases of the project. These regulations cover the major safety areas. Further details of the safety sections relating to this project are also outlined below:

- ✓ General Safety Rules for workers engaged in construction
- ✓ Safety guidelines related to the use of tools and equipment
- ✓ Safety procedures associated with the transportation and of personnel and materials
- ✓ Safety procedures for materials handling, storage and disposal

1.5 Pollution Prevention

Pollution prevention likewise shall also be enforced during all phases of the project. The issues about pollution are avoidable if proper and careful planning is instituted. It is costlier to clean up an accident than to put enough measures to prevent it from happening. Therefore it is important that construction gangs are adequately trained on pollution prevention for this expansion project to be successful. Critical areas that will be considered in pollution prevention are as follows:

1.5.1 Planning and Preparation

Careful planning can reduce the risk of pollution significantly. As a first step, environmental site meetings will be organised with the construction gang by the Project Manager prior to commencement and during construction operations. These meetings will help increase the awareness levels of construction workers and supervisors on what environmental, health and safety measures are required at the project site.

1.5.2 Site Office

The entire project site shall be cordoned off and adequately protected by a fence and locked access to mitigate theft and vandalism. The Project Implementation Team in consultation with the University Security Services shall arrange for site security where construction materials are kept. No foul drains will be allowed to flow through the main university drain. Arrangement will be made by the Drainage and Sewerage Unit for proper connection of drains.

Fire precautions to be observed at site offices in consultation with the University Fire Services include:

- ✓ Provision of satisfactory and appropriate fire extinguishers
- ✓ Adequate ventilation for storage places containing combustible chemicals

1.5.3 Storage, Handling and Disposal of Materials / Oils / Chemicals

The regulation requirements for the laboratory and Offices shall be adhered to. Handling of materials, oils and chemicals shall be regulated by the following guidelines:

- ✓ Materials should be put away in an efficient way and in safe stacks, levels or heaps. Materials should be put away so as not to hinder access ways. Where vital, cautioning signs, lights and blockades should be installed
- ✓ Most chemicals utilized as a part of construction operations, for example, oils, bond, cleaning materials, and paint have potential contamination risks. Every such material should be put away on an impenetrable base inside a bund divider to contain any spillages
- ✓ Spilling or discharge oil/paint/substance drums might be expelled from the site and securely discarded
- ✓ Contents of all chemicals or substances shall be checked and labelled appropriately

- ✓ Transfer of all tanks and drums shall be done securely. All substances in tanks/drums to be arranged shall be exhausted and punctured by capable work force before conclusive safe transfer
- ✓ Fuelling of equipment and vehicles may constitute the most likely spillage dangers. This should be done in assigned ranges with impermeable surfaces found far from existing open depletes nearby. Fuel hoses and valves shall be routinely checked for spillages, wear and tear
- ✓ Emergency spillage procedures shall be clearly outlined and posted conspicuously. Absorbent materials for containing spillages shall be readily available on site. These shall include sawdust, sand, etc.

1.5.4 Concrete Works

Cement and concrete are extremely soluble and destructive and can have a contamination impact on water. Consequently, all concrete and cement works arrangements shall be done far from drains and will be precisely checked to guarantee that such materials do not get into sewerage lines to contaminate streams and any other water bodies.

1.5.5 Waste Disposal

Commonly, waste found at construction sites are vegetation and tree clearing, plastic scraps, cement sacks, and metal scraps. Dustbins shall be provided by the Environmental Health Services Unit for day to day solid waste collection. However, merchants in the significant waste materials will be welcome to truck them away, while the non-reusable ones will be accumulated in fitting waste receptacles to be provided at the site for gathering and transfer through open waste transfer framework with the compactor truck.

1.6 Allocation of Resources for Environmental Management

Aside the human resource to be made accessible for the project, budgetary allocations would guarantee that mitigation, monitoring and training programmes are viably actualized. An amount of GHC 500 will be allocated every 2 weeks for environmental management, including the cost of seedlings for replanting of felled trees. This cost is provided for in the project budget.

Table 1 indicates project activities, with anticipated impact, mitigation measures and their expected net effects.

Table 1 Impact Mitigation Table

PROJECT ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACTS/ACTIVITY	LOCATION	PROPOSED MITIGATION MEASURE (S)	MONITORING/FREQUENCY	POSITIVE IMPACT OF THE PROJECT	ESTIMATED BUDGET
PRE-CONSTRUCTION PHASE.	Vegetation removal	Construction site	Landscaping and re-vegetation will be allowed	Project Coordinator/ One (1) Week	Replacement of lost vegetation	Part of Contractor's cost
	Tree removal	Construction site	Evacuated trees will be supplanted ten times; some around the office and the rest at an area to be settled on with the school administration	Project Coordinator/ One (1) week	Enhancement of vegetation and biodiversity	"
CONSTRUCTION	Dust during construction and vehicular emissions	Construction site and vicinity	Site will be doused with water prior to excavation to reduce dust generation and tarpaulins will be used to cover vehicles during conveyance of sand and stones, Appropriate PPE will be provided for personnel (Compulsory).	Site Supervisor/ Daily	Reduced health effects of dust emissions	"
	Noise	Construction site and vicinity	Earplugs shall be given to workers to reduce their		Reduced noise impacts	"

PHASE	Traffic impacts Occupational Health and Safety issues	Roads serving project area Construction site	exposure to noise(Compulsory) Haulage of material will be timed to coincide with off-peak traffic periods. Every employee shall be familiar to workplace safety rules and how it pertains to his or her specific job. There shall be regular training sessions so that information is fresh in everyone's mind. Provision of fully equipped first aid stations.	Site Supervisor/Daily Health and Safety Officer/ Daily	Reduced traffic impacts. Protection of construction workers and site safety	“ “
OCCUPATION AND MAINTENANCE PHASE	Operational Safety and Security	Within facility	Adequate physical barriers and proper signage and notices will be provided when earthworks are being carried on. Emergency assembly area, fully equipped first aid station, alarms, fully installed fire extinguishers.	Site Supervisor/ Daily Project Coordinator	Site safety and sanitation To mitigate risks of fires, accidental injuries, etc.	“ Part of project costs

1.7 Monitoring Plan

The identified potential environmental impacts for which mitigation measures have been designed will be monitored at the Pre-Construction, Construction and Occupation phases of the project.

1.7.1 Pre-Construction Phase Monitoring Plan

Monitoring at the Construction phase will cover the following.

✓ Vegetation (Grass) Clearing

Grass will have to be cleared to make way for the construction of the building. This has both safety and ecological implications that need to be carefully monitored. The clearing process needs to comply with safety regulations that will be ensured and adhered to. An equivalent number of grasses will be planted ten times at a location as agreed on between the contractor and project team.

1.7.2 Construction Phase Monitoring Plan

The main identified impacts that will be assessed and monitored during construction phases are:

✓ Air pollution

Generation of dust during construction activities shall be checked and monitored on daily basis.

✓ Noise

Noise levels will be monitored and checked on daily basis. In perspective, the construction area is also an operational academic institution, with staff and students effective on campus.

✓ Traffic impacts

Activity impacts will include conveyance of materials to site. This will be observed everyday.

✓ Occupational Health and Safety

Dangers and circumstances of work environment security will be reported and researched when they happen, however much as could reasonably be expected. This will be done every day.

✓ Public Safety

The danger of unplanned falls into excavations by occupants of the school compound, including staff and students, will be observed consistently. This will be a consideration of the sufficient mitigation measures set up at the Construction stage.

1.7.3 Occupation and Maintenance Phase Monitoring Plan

Monitoring at the Occupancy phase will cover the following:

✓ **Run-off Management**

The adequacy of the design features to ensure proper drainage and avoid flooding at the paved area will be monitored, especially during the rainy season. Table 2 shows the monitoring plan for the building project.

Table 2. Monitoring Plan

Parameter	Measurable Monitoring Indicator	Frequency	Responsibility	Expected outcome
Pre-Construction Phase				
Safety issues regarding tree removal	Incidence of accidental injuries, near-misses, etc.	Daily	Site Supervisor	This will ensure that the tree removal is incident-free.
Construction Phase				
Air pollution – dust generation	PM ₁₀ , Total Suspended Solids;	Weekly	Site Supervisor	Controlled dust emissions
Exhaust emissions	NO ₂ , SO ₂	Weekly	Site Supervisor	Controlled exhaust emissions
Traffic impacts	Incidence of obstructed traffic attributable to project vehicular movements	Daily	Site Supervisor	Avoid exacerbation of traffic situation on local (town) roads
Noise	Generated noise above background din dB (A).	Daily	Site Supervisor	Controlled noise generation
Public health and safety	Incidence of breached access to construction site	Daily	Site Supervisor	Avoid accidents and injuries to non-construction personnel
Occupational Health and Safety	Incidents and near misses of accidents	Daily	Site Supervisor	Reduced incidence of accidents and injuries
Occupancy and Maintenance Phase				
Run-off management	Effectiveness of drainage system	During rainy season	Project Manager	Prevention of flooding at facility
Safety and Security	Incidence of emergency incidents like fire, accidental injuries, etc.	Monthly	Laboratory Manager	Preservation of facility