ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

WEST AFRICAN CENTRE FOR WATER, IRRIGATION AND SUSTAINABLE AGRICULTURE (WACWISA) BUILDING

UNIVERSITY FOR DEVELOPMENT STUDIES, TAMALE, GHANA

October, 2020

EXECUTIVE SUMMARY

The West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA) was established in 2019 by the University for Development Studies (UDS) as a semi-autonomous Centre of Excellence. It is a beneficiary of US$ 6.4 million from the World Bank and Government of Ghana as part of the African Centres of Excellence for Development Impact (ACE Impact) Project.

With the main focus of undertaking cutting-edge research and training in irrigation, drainage, water resources management, sustainable agriculture and food systems, environmental management and sustainability, climate change, and food and nutrition security, WACWISA is investing in the construction of a 3-storey Office and Laboratory Complex on the Nyankpala Campus of the University. The cost of the project is GHS 5,686,000.00 (US$ 986,386.96) with a contract duration of sixteen (16) months.

The Works and Physical Development (WPD) Directorate of the UDS, Consultant to the project prepared the Environmental and Social Management and Monitoring Plan for the purpose of monitoring and tracking the implementation and performance of the activities of the Contractor.

This document is to contribute to a sound, safe and sustainable environment and high social standard relating to the implementation of the activities of the Contractor and also occupational maintenance. Strict adherence to the instructions, guidelines, regulations, codes, and ethics relating to engineering and construction of the building project will necessarily be observed.

The expectation is that, the strict implementation and compliance to the content of the Environmental and Social Management and Monitoring Plan (ESMMP) will lead to an environmentally safe, high social performance, sound and sustainable project with little or no adverse impacts on public health and safety of the surrounding/immediate environment as well as persons in close vicinity of the site. All responsibilities, roles and responsible persons have been identified and presented, and therefore are accountable at all times in the project life.

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LIST OF ACRONYMS

DUHS	Directorate of University Health Services
ESMMP	Environmental and Social Management and Monitoring Plan
EPA	Environmental Protection Agency
GNFS	Ghana National Fire Service
GSA	Ghana Standards Authority
PIC	Project Implementation Committee
PPA	Public Procurement Authority
UDS	University for Development Studies
WACWISA	West African Centre for Water, Irrigation and Sustainable Agriculture
WPD	Directorate of Works and Physical Development

Introduction

The West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA) was established in 2019 by the University for Development Studies (UDS) as a semi-autonomous Centre of Excellence to undertake cutting-edge research and training in irrigation, drainage, water resources management, sustainable agriculture, climate change and food and nutrition security. WACWISA is funded by Government of Ghana and the World Bank, under the African Centres of Excellence for Development Impact (ACE Impact) initiative and it also collaborates with other funding agencies to explore new and emerging avenues to advance the frontiers of knowledge. WACWISA has as its vision "to be a leading world-class academic and research-intensive Centre specialized in irrigation, water resources, sustainable agriculture and climate change" and, a mission of "developing skills and knowledge of young men and women to provide practical and sustainable solutions to challenges of water resources, irrigation, agricultural development and climate change in Africa". To help achieve its vision and Mission, a 3-storey Office and Laboratory Complex is to be constructed on the Nyankpala Campus, UDS, to facilitate its work.

The World Bank's Environmental and Social Safeguards Policies are triggered by the project. The E&S risk categorisation of this subproject activity is based on the screening conducted justifying the preparation of this Environmental and Social Management and Monitoring Plan (ESMMP).

Objectives of the ESMMP

The main objective of this ESMMP is to monitor the Contractor in the implementation of construction activities and track his performance in terms of compliance with building and environmental regulations in the construction of the 3-storey WACWISA Office and Laboratory Complex. The ESMMP will specifically:

1. Contribute to a sound, safe and sustainable environment and high social standard relating to the implementation of the activities of the Contractor and also occupational maintenance.
2. Ensure strict adherence to the instructions, guidelines, regulations, codes, and ethics relating to engineering and construction of the building project.
3. Ensure environmentally safe, high social performance, sound and sustainable project implementation with little or no adverse impacts on public health and safety of the surrounding/immediate environment as well as persons in close vicinity of the site.
4. Assign responsibilities to persons who will be accountable at all times in the project life regarding compliance with the ESMMP.

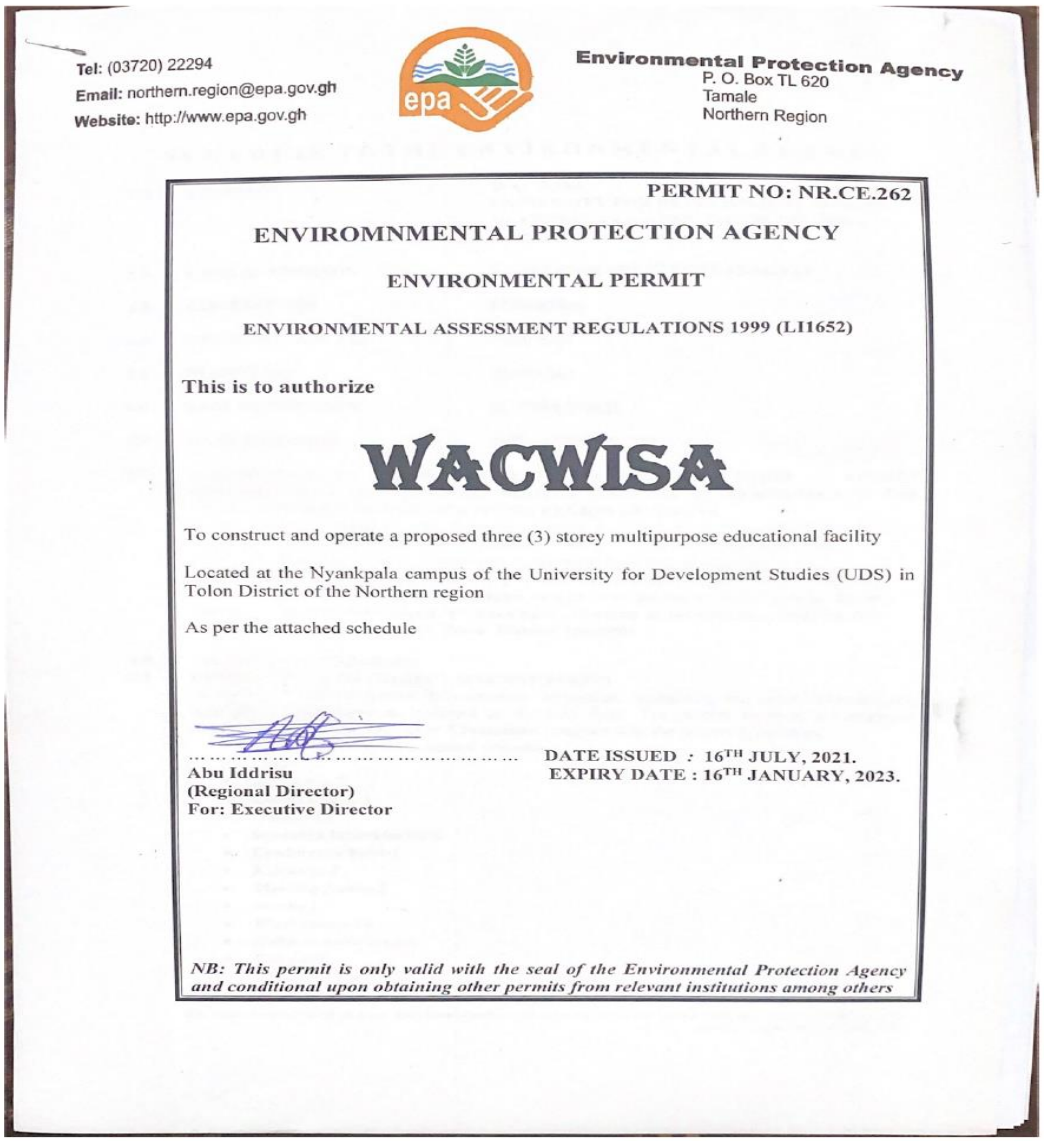
Stakeholder Engagements and Information Disclosure

Key internal and external stakeholders were engaged through consultative meetings and discussions in the formulation of the ESMMP. The internal stakeholders included students, faculty, staff and university management. The external stakeholders included the Environmental Protection Agency (EPA), the Fire Service and relevant local authorities. The main reason for engaging these stakeholders was to create awareness on the impending construction and also to ensure that the construction is undertaken to meet the environmental and social requirements and standards. The project and its description were posted on the WACWISA website (https://wacwisa.uds.edu.gh/) to provide sufficient information to stakeholders throughout the lifecycle of the project. Should there be any significant changes that results in additional risks,

information on the risks and impact will be provided by updating the ESMMP setting out the mitigation measures.

Environmental and Social Permits

To meet the legal and regulatory requirements in the construction of the WACWISA Office and Laboratory Complex at the Nyankpala Campus of the University, an application was made to the Environmental Protection Agency (EPA) for the relevant assessments and permission. Following the application and assessments by EPA, approval was granted under permit No. NR. CE. 262 and based on the Environmental Assessment Regulation 1999 (LI1652).



Tel: (03720) 22294
Email: northern.region@epa.gov.gh
Website: http://www.epa.gov.gh

Environmental Protection Agency
P. O. Box TL 620
Tamale
Northern Region

PERMIT NO: NR.CE.262

ENVIROMNMENTAL PROTECTION AGENCY

ENVIRONMENTAL PERMIT

ENVIRONMENTAL ASSESSMENT REGULATIONS 1999 (LI1652)

This is to authorize

WACWISA

To construct and operate a proposed three (3) storey multipurpose educational facility

Located at the Nyankpala campus of the University for Development Studies (UDS) in Tolon District of the Northern region

As per the attached schedule

Abu Iddrisu
(Regional Director)
For: Executive Director

DATE ISSUED : 16TH JULY, 2021.
EXPIRY DATE : 16TH JANUARY, 2023.

NB: This permit is only valid with the seal of the Environmental Protection Agency and conditional upon obtaining other permits from relevant institutions among others

Figure 1: Environmental Permit for the Construction of WACWISA Block

Location of WACWISA Construction Site

The WACWISA Office and Laboratory Complex (WACWISA Block) construction site is the Eastern part of the Nyankpala Campus of the university for Development Studies. The google map below is the map of Ghana indicating the project site. Following the map is the plan of the campus indicating the specific project site.

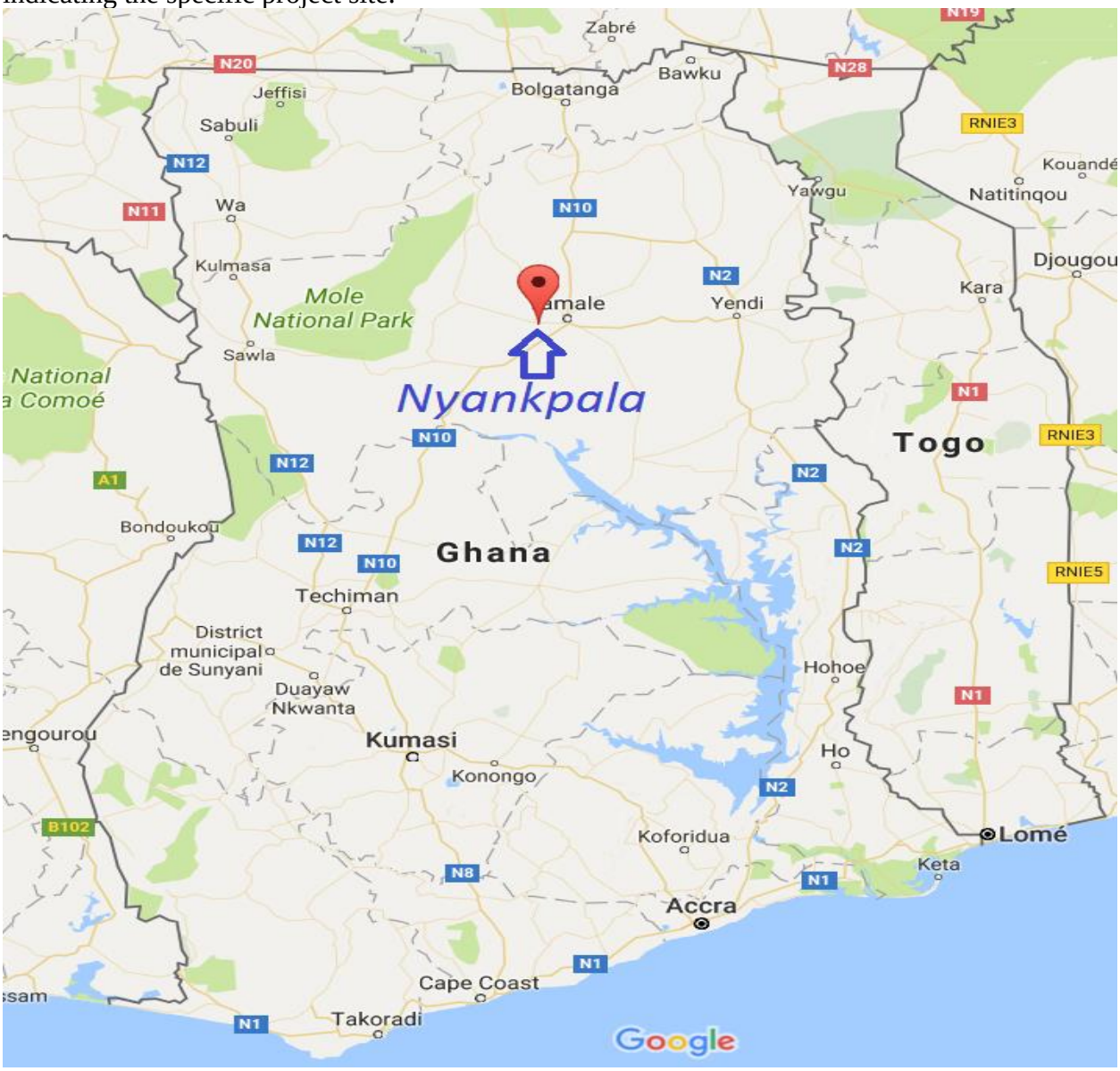


Figure 2: Google Map of Ghana Showing Nyankpala Campus

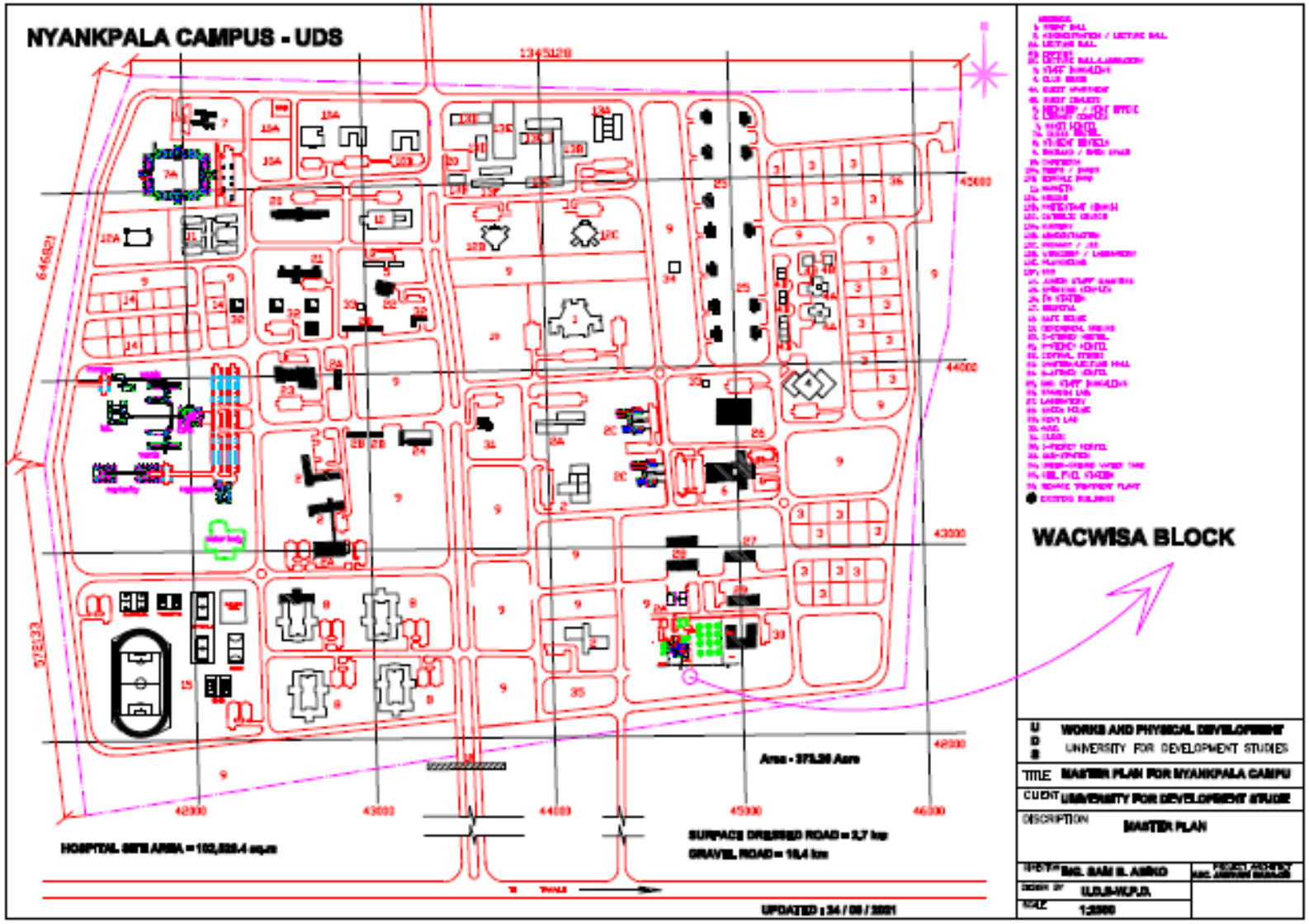


Figure 3: Site Plan of Nyankpala Campus Showing Site for Construction of WACWISA Block

Regulatory, Policy and Institutional Framework

The key environmental policies and legal framework and procedures considered as relevant and to which WACWISA adheres to, include the EPA ACT 490. The Agency among others, functions to ensure compliance with the laid down environmental impact assessment procedures in the planning and execution of development projects, including compliance in respect of existing projects. EPA has a Grievance Redress Mechanism (GRM), which is a system that assists the Agency's clients and the general public to resolve environment related complaints and grievances in a timely, effective and efficient manner. The construction is also being undertaken within the regulatory procedures and checks of the Works and Physical Development (WPD) and the health and safety policy of the University.

Description of the Project Location and Baseline Environmental and Social Baseline Conditions

The construction related activities of the 3-storey building on an already existing University campus, in general is considered to be of a limited environmental impact. The project is rated as environmental assessment Category B according to the World Bank categorization. The project is a new construction with minimum generation of dust and noise. The major environmental issue is about the removal of the top soil and the vegetative cover of the site. There is limited potential environmental and social risks and impacts associated with this project. This is because the 3-storey Office and Laboratory Complex is being constructed on the Nyankpala Campus of the University. The area is an already existing educational university campus in the Nyankpala Township of the Tolon District in the Northern Region of Ghana. A site specific ESMMP for this project in the form of a checklist (Table 1) is prepared in accordance with World Bank guidelines.

Table 1: Checklist of EMMP

Environmental/Social Screening			
Will the site activity include/involve any of the following:	**Activity**	**Status**	**Additional references**
	A. Building rehabilitation	[ ] Yes [x] No	See Section **B** below
	B. New construction	[x] Yes [ ] No	See Section **B** below
	C. Individual wastewater treatment system	[ ] Yes [x] No	See Section **C** below
	D. Historic building(s) and districts	[ ] Yes [x] No	See Section **D** below
	E. Acquisition of land[1]	[ ] Yes [x] No	See Section **E** below
	F. Hazardous or toxic materials[2]	[ ] Yes [x] No	See Section **F** below
	G. Impacts on forests and/or protected areas	[ ] Yes [x] No	See Section **G** below
	H. Handling / management of medical waste	[ ] Yes [x] No	See Section **H** below
	I. Traffic and Pedestrian Safety	[ ] Yes [x] No	See Section **I** below

[1] Land acquisitions includes displacement of people, change of livelihood encroachment on private property this is to land that is purchased/transferred and affects people who are living and/or squatters and/or operate a business (kiosks) on land that is being acquired.

[2] Toxic / hazardous material includes and is not limited to asbestos, toxic paints, removal of lead paint, etc.

Potential Environmental and Social Risks and Impacts

The environmental impacts of the project are expected to be of manageable, temporary and of local impact as they are related to the general construction activities on an already known location. Sound environmental practices from start to completion of the construction of the facility are however, expected. Table 2 presents the list of activities, the potential impacts and the mitigative methods put in place to ensure environmental and social sustainability.

Description of the Proposed Activities/Works

A number of activities are to be carried out in the execution of the project and these will be in different stages. Thus, sound environmental practices will be employed from start to completion of the construction of the facility. The stages of the project include but not limited to:

1. **Preparatory/Pre-Construction Stage:** This includes all physical site preparation activities necessary for the start of the construction and it includes:
   - Vegetation/Top Soil removal;
   - Vegetative matter removal;
   - Land levelling; and
   - Carting of materials away and to the site, etc.
2. **Construction Stage:** This includes activities such as excavations, movement of earth material, construction equipment operation, etc. that will have direct or indirect linkage with pollution emanating from noise, traffic, air quality, public health, occupational health and safety, equipment handling and use, etc.
3. **Occupancy/Utilisation Stage:** Cleaning of site before occupancy and safe disposal of waste material is very necessary before occupation. During the occupancy and utilisation stage, the safe use of the facility as well as the safe use and disposal of materials including hazardous waste like laboratory chemicals, as well as non-hazardous waste material such as used paper is very necessary. The facility is designed to have a safe management system for solid, liquid, and gaseous waste as well as safe drainage system.

Risks and the Impact on Construction Works

- Risk of COVID-19 Infections among construction workers - the highly contagious COVID-19 infection could readily spread among workers which can slow the construction activities.
- Risk of use of Child Labor or forced labour for the works by the contractor.
- Sexual Exploitation and Abuse/Sexual Harassment during construction.
- Labour disputes over terms and conditions of employment of contractor workers.
- Risks of accidents and site incidents.
- Risk of the facility not providing disability access.
- Risk of not adhering to O&M measures after construction by the centre which could affect the sustainability of the facility, etc.

Environmental and Social Mitigation Measures and Monitoring Plan and Structure

The ESMMP aimed at ensuring sound environmental and social performance practices throughout the implementation of the project. The University administrative structures which use the Public Procurement Authority (PPA) procedures and processes will be used for the procurement of a qualified contractor. Specifically, WACWISA will use the National Competitive Tendering process to engage the services of a qualified building contractor for the construction of the project. A Project Implementation Committee (PIC) shall be constituted as follows:

Director, WPD	Chairman
Director, UHS	Member
Principal, Nyankpala Campus	Member
Head of Estates Department	Member
Monitoring & Evaluation (M&E) Coordinator, WACWISA	Member
Administrative Coordinator, WACWISA	Member
Environment and Safeguards Coordinator	Member

The Committee shall ensure environmental and social compliance of all activities implemented at the project preparatory/pre-construction as well as the construction stage by the contractor. Activities for the sound environmental and social practices shall be part of the bidding documents and bills of quantities.

The M&E Coordinator of WACWISA shall report to the Director of WACWISA to ensure that environmental and social considerations of issues and their related costs are factored into proposed activities and their budgets. The PIC will be responsible for coordinating and overseeing the activities of the construction and the monitoring of specific environmental and social criteria.

The occupancy/utilisation stage shall solely be handled by administrative system of WACWISA and this includes ensuring all the necessary safety systems are put in place for the management of environmental issues as well as the maintenance of facilities of the constructed project. It will ensure that the facility is put to maximum utilisation and little or no adverse environmental and social impacts are recorded.

This Environmental and Social Management and Monitoring Plan considers serious all rules and regulations of national regulatory authorities/institutions and the University for Development Studies relating to noise, human wellbeing and safety and sanitation in and around the University Campus.

With the aim of protecting human health, the Estates Department of the Directorate of Works and Physical Development (WPD) and the Directorate of University Health Services (DUHS) of the University for Development Studies (UDS) are jointly responsible for the implementation of the content of this Environmental and Social Management and Monitoring Plan (ESMMP). The two Directorates will jointly work to protect the health and life of the human population and the environment by promoting practices that will enhance human life and not adversely affect health or the quality of life as well as the ecosystem. This includes workers on the site, staff, students on the University Campus and all human and environmental related effects that may arise from the implementation of the construction.

Functions of the Project Implementation Committee (PIC)

The functions of PIC shall include:

1. Ensuring project compliance with all environmentally and socially friendly, health and safety regulations.
2. Liaising with all relevant regulatory bodies and organisations – Ghana Standards Authority (GSA), Environmental Protection Agency (EPA), Ghana National Fire Service (GNFS), etc. to ensure compliance with all local and national government authority requirements.
3. Formulating and reviewing environmental, health and safety policies and practices, and social matters associated with the implementation of the project.
4. Assisting in the education and training of project staff on environmental, social and safety awareness.
5. Making budgetary provision for project environmental and social programmes.
6. Undertaking environmental and social monitoring activities for the project.
7. Addressing and resolving grievances arising from the activities of the project.

The Chairman of the PIC shall have the following responsibilities amongst others:

1. Monitoring all environmental and social activities for preparatory/pre-construction and construction stages of the project, including those related to bio-physical and socio-economic/cultural components.
2. Organising activities to motivate and maintain the interest of project staff and project owners in environmental and social issues.
3. Ensuring that, an incident record system is in place at the site for the purposes of recording all site incidents including accidents.
4. Coordinating investigations on all types of accidents on or off-site related to the project.
5. Working closely with construction teams to ensure that all monitoring and mitigation guidelines recommended for the project are strictly adhered to during the various stages including all health and safety guidelines outlined.
6. Conducting environmental and safety audits in accordance with project monitoring guidelines.
7. Producing the relevant environmental and social reports covering the project, including records of grievances and their resolution.
8. Working closely and coordinate efforts of all relevant institutions e.g. EPA, GNFS, etc. to ensure full compliance with all legal and regulatory requirements.
9. Establishing and running a reporting system on progress in implementing mitigation measures including contractor obligation, training, etc.

General Health and Safety Procedures

The Factories, Offices, and Shops Act 328 (1970) as Amended PNDCL 66 (1983). 1, as Amended PNDCL 275 (1991). 2 and Ghana National Fire Service Act 537 (1997) will be strictly complied with at the Construction, Operation and Maintenance stages of the project. Of immense importance of these Acts and Laws to this, especially Act 328 (1970) to the ESMMP are:

a. Notification of Accidents

- Notification of accidents and incidents.
- Notification of dangerous occurrences.
- Notification of industrial diseases.

b. Health and Welfare

- Cleanliness.
- Overcrowding.
- Ventilation.
- Washing facilities.
- Lighting.
- Drainage of floors.
- Sanitary conveniences.
- Drinking water.
- Accommodation for clothing.
- Sitting facilities.
- Removal of dust or fumes.
- Protective clothing and appliances.
- Noise and vibrations.
- Prohibition of lifting excessive weights.
- First aid.
- Power to require medical supervision.
- Health and wealth regulations.

c. Safety

- Prevention of fire.
- Fire alarms.
- Safety provisions in case of fire.
- Safe means of access and safe place of employment.
- Floors, passages and stairs.
- Training and supervision.
- Cleaning of machinery.
- Fencing of dangerous machinery.
- Safeguards for transmission machinery.
- Construction and maintenance of fencing.
- Construction and sale of machinery.
- Vessels containing dangerous liquids.
- Self-acting machines.
- Hoists and lifts.
- Chains, ropes and lifting tackle.
- Cranes and other lifting machines.

- Register of chains, ropes, lifting tackle and machines.
- Dangerous fumes and lack of oxygen.
- Explosive or inflammable substances.
- Safety regulation.

These regulations cover the major safety areas. Further details of the safety sections relating to this construction project are indicated as:

1. General Safety Rules for workers engaged in the construction.
2. Safety guidelines related to the use of tools and equipment.
3. Safety procedures associated with the transportation and of personnel and materials.
4. Safety procedures for material handling, storage and safe disposal of waste materials.
5. Directives given as part of the management of an emergency e.g. collapse systems, infectious diseases/pandemic, etc.

Pollution Prevention and Control

Pollution prevention shall also be enforced during all stages of the project implementation. The issues about pollution are avoidable if proper and careful planning is undertaken and appropriate measures in place. It is costly to clean up an accident than to put enough measures to prevent its occurrence. Therefore, it is important that construction teams are adequately trained on pollution prevention and control on site for a successful project implementation. Critical areas that will be considered in pollution prevention and control are:

a. Activity Planning and Preparation

Careful activity planning can reduce the risk of pollution significantly. As a first step, environmental site meetings will be organised with the construction team by the PIC Chairperson 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.

b. Project Site Office

The entire project site shall be cordoned-off and adequately protected by a fence and locked access to mitigate theft, vandalism and control workers. A security post with a security officer shall control access to the site for all human and vehicular traffic. The PIC 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(s). Arrangement will be made by the Works and Physical Development Directorate for proper connection of sewerage drains.

Fire precautions to be observed at the site office and all construction areas in consultation with the University Security Services include:

1. Provision of satisfactory and appropriate fire extinguishers.
2. Adequate ventilation for storage places containing combustible chemicals/materials.
3. Adequate fire training for all personnel on site.

c. Storage, Handling and Disposal of Construction Materials

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

1. Construction materials should be put away in an efficient way and in safe stacks, levels or heaps. Materials should be put away as not to hinder access ways. Where vital, cautioning signs, lights and blockades should be provided/installed.
2. Most chemicals utilized as part of the construction operations, e.g. oils, bond, cleaning materials, machinery lubricants, and paint have potential contamination risks. Every such material should be put on an impenetrable base inside a bund divider to contain spillages.
3. Spilling or discharge of oil, lubricant, paint or substance drums might be expelled from site and securely discarded.
4. Contents of all chemicals or substances shall be checked and labelled appropriately.
5. 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 workforce before conclusive safe transfer.
6. Fuelling of equipment and vehicles may constitute the most likely spillage dangers at the construction site. 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.
7. Emergency spillage procedure shall clearly be outlined and posted conspicuously. Absorbent materials for containing spillages shall be readily available on site and these shall include, sawdust, sand, etc.

d. Concrete Works

Cement and concrete are extremely soluble and destructive and can have a contamination impact on open water sources especially. 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, rivers and other water bodies.

e. Waste Disposal

Commonly, waste found at the construction site are vegetation, tree clearing, plastic scraps, top soil, cement sacks, waste wood, metal scraps, etc. Dustbins shall be provided by the Contractor or UHS, Directorate as the case may require for the day-to-day solid waste collection. However, merchants in the significant waste stream materials will be welcome to truck them away into designated and approved safe disposal areas such as landfills whilst 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.

Allocation of Resources for Environmental Management and Monitoring

Aside the human resources to be made available and accessible for the project, budgetary allocations would guarantee that mitigation, monitoring and training programmes are viably

actualized. An amount of GHS 1,000 will be allocated every two (2) weeks for environmental and social management, including the cost of seedling for replanting of all felled trees, replacement of vegetative cover, greening like lawn establishment, etc. This cost shall be provided for in the project budget. Table 2 indicates project activities, with anticipated impact, mitigation measures and their expected net effects.

Table 2: Impact Mitigation Matrix

Activity	Potential Environmental Impacts/ Activity	Location	Proposed Mitigation Measure(s)	Monitoring/ Frequency	Responsibility	Positive Impact of the Project	Estimated Budget
Pre-Construction Stage	Vegetation/Top Soil removal	Construction Site	Landscaping and re-vegetation will be allowed	Project Coordinator/ Contractor/ One (1) week	Project Manager	Replacement of lost vegetation	Part of Contractors Costs
	Tree removal	Construction Site	Evacuated trees will be re-planted ten times; some around the office and the rest at an area to be settled on with the WACWISA/University Authorities	Project Coordinator/ Contractor /One (1) week	Project Manager	Enhancement of vegetation and biodiversity	Part of contractor's costs
Construction Stage	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 haulage of sand and stones. Appropriate PPE will be provided for personnel (compulsory)/sprinkling of water on site	Site Supervisor/ Daily	Contractor	Reduced health effects of dust emissions	Part of contractor's costs
	Noise	Construction site and vicinity	Earplugs shall be given to workers to reduce their exposure to noise (compulsory) and regular	Contractor/ Site Engineer	Contractor	Reduced noise impacts	Part of contractor's costs

			servicing of machinery and equipment				
	Traffic impacts	Roads serving project area	Haulage of material will be timed to coincide with off-peak traffic periods Provision of signs	Site supervisor/ daily	Contractor/ Project Manager	Reduced traffic impacts	Part of contractor's costs
	Occupational Health and Safety Issues	Construction site	Training for every employee to 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. Provide mechanism for grievance redress and guarantee workers the freedom to associate and assembly, Ensure non-discrimination and balance of workforce between men and women as the case may be	Health and Safety Officer/Daily Contractor	Project Manager/ Contractor	Protection of construction workers and site safety	Part of contractor's costs
	Public safety	Construction site	Adequate physical barriers and proper signage and notices will be provided when earthworks are being carried on.	Site supervisor/ Daily	Contractor	Site safety and sanitation	Part of contractor's costs

Occupation and Maintenance Stage	Operational Safety and Security	Within facility	Emergency assembly area/point, fully equipped first aid stations, alarms, fully installed fire extinguishers, safe disposal systems for hazardous laboratory chemicals Create awareness on sexual transmitted diseases and gender-based violence	Project coordinator		To mitigate risks of fires, accidents, injuries, etc.	Part of project costs.

Monitoring Plan

The identified potential environmental and social impacts for which mitigation measures have been designed will be monitored at the pre-construction/preparatory, construction and occupation/utilisation stages of the project.

a. Pre-Construction Stage Monitoring Plan

Monitoring at the pre-construction stage shall cover the following:

i. Vegetation (Grass) Clearing/Top Soil Removal

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 (10) times at a location as agreed on between the contractor and the project team. Top soil which harbours or serve as a home for most biodiversity will also be cleared for all the constructional works and this means a destruction of the ecosystem. Appropriate measures necessary for all environmental safety issues would therefore be put in place during this stage.

b. Construction Stage Monitoring Plan

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

i. Air Pollution

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

ii. 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.

iii. Traffic Impacts

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

iv. 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.

v. Public Safety

The danger of unplanned falls into excavations by individuals on the University Campus including staff and students will be observed consistently. This will be a consideration of the sufficient mitigation measures set-up at the construction stage.

Also, general constructional activities and their mitigation measures necessary for monitoring during the construction stage are presented in Table 3.

c. Occupation and Maintenance Phase Monitoring Plan

During the occupancy and utilisation stage, the safe use of the facility as well as the safe use and disposal of materials including hazardous waste like laboratory chemicals, as well as non-

hazardous waste material such as used paper is very necessary. The facility is designed to have a safe management system for solid, liquid, and gaseous waste as well as safe drainage system that will be closely monitored during occupancy. 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 3 presents the monitoring plan for the building project.

Table 3: Monitoring Plan

Parameter	Measurable Monitoring Indicator	Frequency	Responsibility	Expected Outcome
Pre-Construction Stage				
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_2SO_2	Weekly	Site Supervisor	Avoid exacerbation of traffic situation on local (town) or campus roads
Noise	Generated noise above background in dB (A)	Daily	Site supervisor	Controlled noise generation especially from vehicles
Public health and safety	Incidence of breached access to construction site	Daily	Site Supervisor	Avoid accidents and injuries especially to non-construction personnel
Occupational health and safety	Incidents and near misses of accidents	Daily	Site Supervisor	Reduced incidence of accidents and injuries
Environmental or land destruction	Incidence of erosion and eroded areas	Weekly	Site Supervisor	Reduced eroded surfaces especially vehicular travel paths
Occupancy and Maintenance Stage				
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

Also, general constructional activities and their mitigation measures necessary for monitoring during the construction stage are presented in Table 4.

Table 4: Activity and Mitigation Measures

Activity	Baseline	Parameter	Mitigation Measures Checklist
A. General Conditions	Current general conditions are good and assures worker safety	Notification and Worker Safety	(a) The local construction and environment inspectorates and communities have been notified of upcoming activities. (b) The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works). (c) All legally required permits have been acquired for construction and/or rehabilitation. (d) All work will be carried out in a safe and disciplined manner designed to minimize impacts on neighbouring residents and environment. (e) Workers' PPE will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots). (f) Appropriate signposting of the sites will inform workers of key rules and regulations to follow.
B. General Rehabilitation and /or Construction Activities	The air quality in the vicinity is considered not polluted as there are no major activities around to affect the quality of the air.	Air Quality	(a) During interior demolition use debris-chutes above the first floor (b) Keep demolition debris in controlled area and spray with water mist to reduce debris dust (c) Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site (d) Keep surrounding environment (sidewalks, roads) free of debris to minimize dust (e) There will be no open burning of construction / waste material at the site (f) There will be no excessive idling of construction vehicles at sites

	The site is an educational zone and therefore it is serene and with little noise.	Noise	(a) Construction noise will be limited to restricted times agreed to in the permit (b) During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible
	Ground and surface water resources are not readily available for exploration or utilisation. The project will therefore have no effect on groundwater resources quality and also downstream water quality.	Water Quality	(a) The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers.
	The environment currently has no challenge with respect to waste management.	Waste management	(a) Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities. (b) Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. (c) Construction waste will be collected and disposed properly by licensed collectors (d) The records of waste disposal will be maintained as proof for proper management as designed. (e) Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)
C. Individual wastewater	There is no centralised wastewater treatment systems. Wastewater is	Water Quality	(a) The approach to handling sanitary wastes and wastewater from building sites (installation or

treatment system	managed through safe disposal systems such as soak-aways.		reconstruction) must be approved by the local authorities (b) Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment (c) Monitoring of new wastewater systems (before/after) will be carried out
D. Historic building(s)	No heritage or historic buildings are present in the locality	Cultural Heritage	(a) If the building is a designated historic structure, very close to such a structure, or located in a designated historic district, notify and obtain approval/permits from local authorities and address all construction activities in line with local and national legislation (b) Ensure that provisions are put in place so that artifacts or other possible "chance finds" encountered in excavation or construction are noted, officials contacted, and works activities delayed or modified to account for such finds.
E. Acquisition of land	The project does not require land acquisition as the land is for the University. The site will not disturb or affect livelihoods and sources of livelihoods/incomes as it is a reserved land for construction of educational infrastructure.	Land Acquisition Plan/Framework	(a) If expropriation of land was not expected and is required, or if loss of access to income of legal or illegal users of land was not expected but may occur, that the bank task Team Leader is consulted. (b) The approved Land Acquisition Plan/Framework (if required by the project) will be implemented

F. Toxic Materials	The site and its neighbourhood do not have toxic materials.	Asbestos management	(a) If asbestos is located on the project site, mark clearly as hazardous material (b) When possible, the asbestos will be appropriately contained and sealed to minimize exposure (c) The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust (d) Asbestos will be handled and disposed by skilled & experienced professionals (e) If asbestos material is be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately (f) The removed asbestos will not be reused
	The site and its neighbourhood do not have toxic materials.	Toxic / hazardous waste management	(a) Temporarily storage on site of all hazardous or toxic substances will be in safe containers labelled with details of composition, properties and handling information (b) The containers of hazardous substances should be placed in a leak-proof container to prevent spillage and leaching (c) The wastes are transported by specially licensed carriers and disposed in a licensed facility. (d) Paints with toxic ingredients or solvents or lead-based paints will not be used
G. Affects forests and/or protected areas	The site is not a forested area	Protection	(a) All recognized natural habitats and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities. (b) For large trees in the vicinity of the activity, mark and cordon off with a fence large tress and protect root system and avoid any damage to the trees

			(c) Adjacent wetlands and streams will be protected, from construction site run-off, with appropriate erosion and sediment control feature to include by not limited to hay bales, silt fences (d) There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.
H. Disposal of medical waste (not applicable)	No medical waste available at the site	Infrastructure for medical waste management	(a) In compliance with national regulations the contractor will insure that newly constructed and/or rehabilitated health care facilities include sufficient infrastructure for medical waste handling and disposal; this includes and not limited to: ▪ Special facilities for segregated healthcare waste (including soiled instruments "sharps", and human tissue or fluids) from other waste disposal; and ▪ Appropriate storage facilities for medical waste are in place; and ▪ If the activity includes facility-based treatment, appropriate disposal options are in place and operational
I. Traffic and Pedestrian Safety	The layout of the area has the established road network and therefore no vehicular traffic in the said area.	Direct or indirect hazards to public traffic and pedestrians by construction activities	(a) In compliance with national regulations the contractor will ensure that the construction site is properly secured and construction related traffic regulated. This includes but is not limited to ▪ Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes.

			▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement ▪ Active traffic management by trained and visible staff at the site, if required for safe and convenient passage for the public. ▪ Ensuring safe and continuous access to office facilities, shops and residences during renovation activities, if the buildings stay open for the public.
Grievances	The stakeholders of the project are the University community and the project and the grievance communication systems of the University and WACWISA are available.	Disturbances relating to affecting teaching and learning on the campus.	They project has established a grievance system for complaints to the project manager for the purpose of redress

Description of the Arrangements for Handling Complaints and Settling Potential Conflicts and Sexual Exploitation and Abuse/Sexual Harassment and Child Labour Prevention Measures

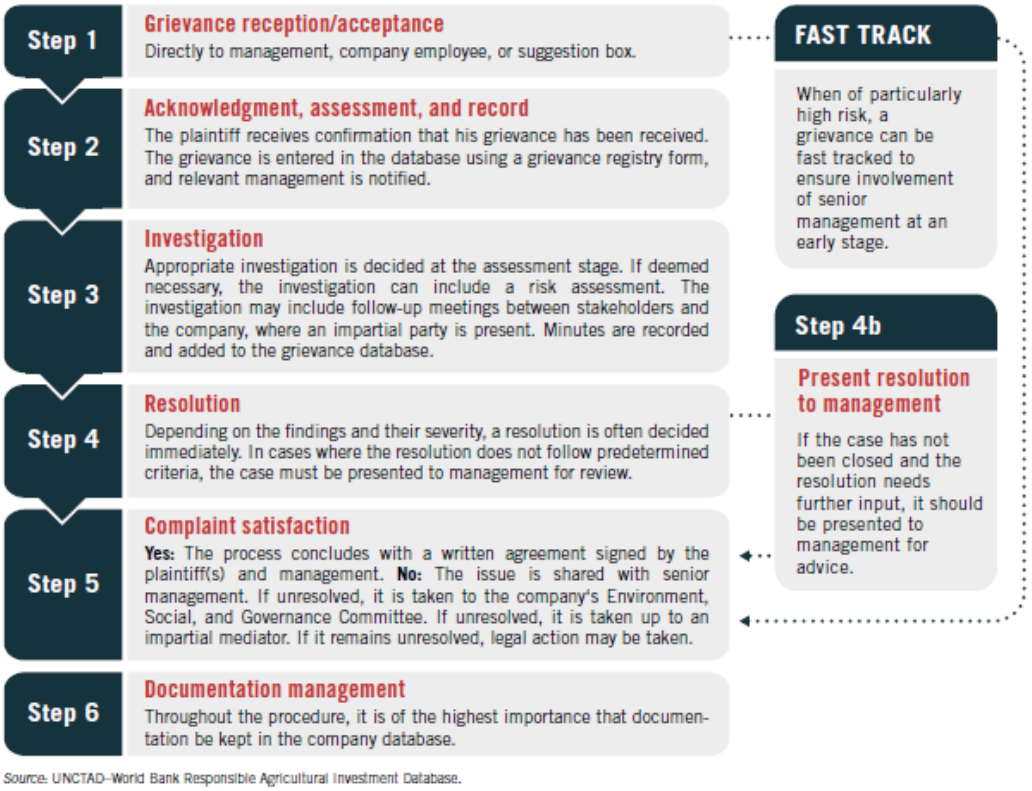
The systems in place for handling complaints and settling of conflicts and sexual exploitation and/or harassment issues are available at https://wacwisa.uds.edu.gh/downloads/documents/sexual-harassment-policy/ .

Also, measures to prevent sexual exploitation and harassment as contained in the following documentations shall apply:

1. WBG Action Plan for Preventing and Addressing Sexual Harassment available online at: https://thedocs.worldbank.org/en/doc/895091561658673520-0090022019/original/WBGSexualHarassmentActionPlanFINALPublic.pdf

2. The Advocates for Human Rights available online at: http://hrlibrary.umn.edu/svaw/harassment/explore/5prevention.htm

Measures taken to prevent Child labour during the construction works of the block shall be in accordance to the Ghana Children Act 1998 (Act 560) and available online at: http://www.unesco.org/education/edurights/media/docs/f7a7a002205e07fbf119bc00c8bd3208a438b37f.pdf



Source: UNCTAD–World Bank Responsible Agricultural Investment Database.

Figure 4: presents the grievance address system that will be used in the resolution of all grievances.

Training Requirement

The ESMMP does not require any training of personnel before implementation. It however, will require some resources to support sensitization on the activities and their effect and as well as public notification of any issues that need communication.

Table 5: Detailed Budget

Activity	**Frequency/Time Frame**	**Budgeted Amount (USD$)**
Preparation of the ESMMP	Once before project commences	50,000.00
Activity planning and Preparation	Once	20,000.00
Capacity Building of Technical Officers on environmental and social issues	Quarter 1 & 2 of project Implementation	80,000.00
Meetings and Implementation of Planned Activities	Quarterly	50,000.00
Grievance Mechanism Systems	Daily	30,000.00
ESMMP Activity Monitoring and Regular Supervision on Environmental Aspects	Monthly	130,000.00
Institutional Strengthening and Capacity Building and Awareness Creation	When Need Be	100,000.00
COVID 19 and Other Risks Mainstreaming	Quarterly	75,000.00
Total		**535,000.00**