

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN
(ESMP) FOR THE CONSTRUCTION
OF
ACE PUTOR BUILDING COMPLEX**



ACE PUTOR UNIPORT

**AFRICA CENTRE OF EXCELLENCE FOR PUBLIC
HEALTH AND TOXICOLOGICAL RESEARCH
UNIVERSITY OF PORT HARCOURT**

January, 2022

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY1

2.0 INTRODUCTION.....13

2.1 Project Brief13

2.2 Proposed Design of The ACE PUTOR Building Complex.....17

2.3 Approach And Methodology18

2.3.1 Bibliographic research / literature review.....18

2.3.2 Site Inspection.....19

2.3.3 Stakeholder Consultations21

2.3.4 Reporting.....25

3.0 INSTITUTIONAL, POLICY AND LEGAL FRAMEWORK.....26

3.1 National Policy Framework26

3.2 World Bank Environment and Social Policies26

3.3 Institutional Framework.....30

3.4 Legal Framework.....31

3.5 Comparing National Procedures and World Bank Policies.....32

4.0 DESCRIPTION AND ANALYSIS OF THE INITIAL STATE OF THE ENVIRONMENT33

4.1 Air Quality33

4.2 Soil35

4.3 Hydrogeologic Assessment.....36

4.4 Noise Level.....37

4.5 Micro Meteorological Data37

4.5.1 Temperature38

4.5.2 Rainfall39

4.5.3 Humidity39

4.5.4 Wind Pattern39

4.5.5 Cloud Cover40

4.6 Vegetation Studies40

4.7 Socio-Economics..... 40

5.0 DESCRIPTION OF ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROJECT.....43

5.1 Project Area of Influence.....43

5.1.1 Physical Environmental Media Influence43

5.1.2 Geographical Area of Influence.....43

5.1.3 Community Influence and Vulnerable Persons44

5.1.4 Institutional Influence44

5.2 Project Activities of Environmental and Social Concern44

5.3 Criteria For Impact Evaluation47

5.4 Evaluation Of Potential Impacts Associated with The Proposed Project.....48

5.4.1 Evaluation of potential Pre-construction phase Adverse Impacts49

5.4.2 Evaluation of potential Construction Phase Adverse Impacts50

5.4.3 Evaluation of potential Operation and Maintenance Phase Adverse Impacts.....53

6.0 ENVIRONMENTAL AND SOCIAL MITIGATION MANAGEMENT PLAN54
6.1 Mitigation Plan.....55
6.2 Environmental And Social Monitoring Plan63

7.0 ENVIRONMENTAL MANAGEMENT STRUCTURE.....68
7.1 Environmental Social Management Plan Objective68
7.2 Use of Environmental Social Management Plan.....69
7.3 Project Implementation Team (PIT).....70
7.3.1 Functions of the Project Implementation Team (PIT)71
7.4 General Health and Safety Procedures72
7.5 Grievance Redress Process72
7.5.1 Objective and Purpose of Grievance Redress Mechanism.....73
7.5.2 Potential grievances/disputes.....73
7.5.3 Redress Mechanism73

8.0 Disclosure of ESMP.....76
8.1 In-Country Disclosure Process76
8.2 Infoshop.....76

9.0 CONCLUSION.....76
10.0 REFERENCES.....78
11.0 ANNEXES.....79

List of Figures

Figure 2.1: University of Port Harcourt, showing Project Site19

Figure 2.2: Google earth location of the proposed site bounded in Red20

Figure 4.1: Mean Temperature for Rivers State 1991-202038

Figure 4.2: Mean Rainfall in Rivers State 1991-2020.....39

List of Tables

Table 1.1: Relevant Regulations Relating to Environmental Protection in Nigeria5

Table 2.1: Construction Activities14

Table 3.1: Summary of World Bank Policies and potential triggers for the PUTOR project27

Table 4.1: Air quality Result in the proposed project area.....34

Table 4.2 Noise Level across the project Area37

Table 4.3: Housing types in the Project Area.....41

Table 5.1: Potential impact associated with the pre-construction phase49

Table 5.2: Potential impact associated with the construction phase50

Table 5.3: Potential impact associated with the operation and maintenance phase.....53

Table 6.1: Proposed mitigations associated with Impacts.....55

Table 6.2: Proposed Environmental and Social Monitoring Plan63

List of Plates

Plate 2.1: Front View of ACE PUTOR building Complex17

Plate 2.4: Right View of ACE PUTOR building Complex17

Plate 2.3: Back View of ACE PUTOR building Complex.....18

Plate 2.4 State of the Site before the project21

Plate 2.5: Display of abundance of Shrub’s at the project Site21

Plate 2.6 Stake Holders having an Interactive session at the proposed project Site22

Plate 2.7 Stake holders at the entrance to the project Site by East west Road Choba23

Plate 2.8: Stake Holders in a discussion at the project Site.....24

Plate 4.1: Soil type in the area36

Acronyms and Abbreviations

BOQ	Bill Of Quantities
EPA	Environmental Protection Agency
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FMEV.	Federal Ministry of Environment
LI	Legislative Instrument
IPS	Institute of Petroleum Studies Hostel
OP	Operational Procedures
PPE	Personal Protective Equipment
UPH	University of Port Harcourt
PUTOR	Public Health and Toxicological Research
PPWSD	Physical Planning & Works/Services Department
WB	World Bank
AAU	Association of African Universities
GRM	Grievance Redress Mechanism
PAP	Project affected persons
PIT	Project Implementation Team
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism

1.0 EXECUTIVE SUMMARY

PUTOR is a World Bank funded African Centre of Excellence for Public Health and Toxicological Research. As a World Bank funded initiative, it is a platform for providing inter-disciplinary academic stream of postgraduate programmes and rapidly bridge the current paucity of adequately trained personnel with terminal degrees in public health, toxicology, nutrition and midwifery/child health nursing in sub-Saharan Africa. The Centre (PUTOR) was established in the year 2018 through funding from the World Bank. The Faculty of Basic Medical Sciences, Dentistry and Biomedical and Sciences, University of Port Harcourt (UPH) proposed establishing the Centre to address the need for man power development in Child health Nursing, public health and toxicology which is a major development challenge in this region of the world as well as enhance capacity especially in nutrition disorders.

PUTOR under the Africa Centre of Excellence (ACE) impact project, has a key milestone under the disbursement linked Indicator 4.3 (DLI 4.3): for the construction of the PUTOR Building complex to be achieved before the end of the project. The Government of Nigeria, under the University of Port Harcourt has received financing from the World Bank towards the cost of implementation of this project.

National Environmental Impact Assessment (EIA) Decree 86 of 1992 requires that for any start-up project which has potential to impact negatively on the environment and people, the undertaking should be assessed for its environmental and social impacts, and the appropriate mitigation measures identified prior to the undertaking for implementation. Given its potential for environmental and social impacts during implementation, the **PUTOR** project triggers the World Bank environment and social policies, and the AAU ESMF classifies this project as "category C". This is because its adverse effects on the population or areas of environmental importance are minimal, site specific and likely reversible, and mitigation measures can be more easily designed/implemented.

World Bank projects are guided by Environmental and Social Safeguards Guidelines and Operational Policies. This enables the integration of environmental and social considerations into the development, planning and execution of projects. These were used as a guide to support PUTOR's environmental and social (E&S) risk management. Among all the World Bank environmental and social safeguard policies, *two Operational Policies and Bank Procedures (BPs) were triggered* under the PUTOR Project, namely:

- ***OP 4.01 Environmental Assessment*** which covers impacts on the environment (air, water and land), human health and safety, physical cultural resources, and global transboundary and environmental issues. This policy is triggered because the project is likely to have environmental risks and impacts on its area of influence. The policy requires that environmental and social consequences be identified early in the project cycle and considered in the selection, location, planning, and design of the project to minimize, prevent, reduce, or compensate for adverse impacts and thereby maximize positive impacts.
- ***OP 4.11 Cultural Physical Resources*** which provides cultural heritage guidelines to avoid or mitigate adverse impacts of development projects. This policy applies to the following projects: (i) any project involving major excavation, demolition, earthworks, flooding or other environmental modifications; (ii) any project located on or near a site recognized as cultural property; (iii) any project designed to support the management or conservation of physical cultural property. This will also concern buildings of historical value and which would be subject to rehabilitation works.

Proposed Construction of PUTOR building complex to be provided by Project

The site for construction of the PUTOR building complex, which has a total land area measuring 7597.964sqm, is located on the University of Port Harcourt campus in Choba, Port Harcourt, Nigeria. The proposed site shares its boundaries with the Institute of Petroleum Studies Hostel (IPS), Prof Nimi Briggs Hostel and the Rotary Building. The design of the building complex will

incorporate education and laboratory facilities, which will include classrooms, auditorium, research laboratories and office spaces as well as restaurants.

The construction works will include site clearance, excavation of the earth for the building foundation, disposal of excavated materials from the site, filling to level up foundation, laying of foundation blocks and concrete and reinforcement works for the foundation. The Structural Framework will also entail blockwork, concrete works, roof carpentry and covering. Finishing works will involve joinery works, glazing works, wall, floor and ceiling finishes, and plumbing and electrical fixtures. The external works will include horticulture & landscaping works and waste disposal.

Objectives of The Environmental and Social Management Plan (ESMP)

The objective of any Environmental and Social Management Plan (ESMP) is to predict the possible changes on the broad ecosystem that may arise as a consequence of a proposed development project. Thus, ESMP processes are Sine Qua non in all development actions that may drastically or otherwise alter the baseline / ambient conditions of the project site.

It technically examines how the proposed project could affect the people, their biophysical environment and their households. Against this backdrop, caution must be taken to ensure that the baseline data against which the changes are measured are as objective as possible, and a true and proper reflection of the actual situations. This is so to ensure that changes that are said to occur from the effects of the new developments are distinguished from changes through random natural processes or by natural succession.

Thus, the ultimate goal of ESMP is to avoid or, when avoidance is not possible, to minimize and mitigate adverse project impacts on the environment and affected people, and to help strengthen safeguard systems and develop the capacity to manage environmental risks.

The plan will outline the possible environmental and social risks and the impacts (positive or negative) associated with a development intervention. During project implementation, the plan will help to define measures and processes to effectively manage risks and enhance positive impacts.

The specific objectives of the ESMP include the following:

- Identification of possible direct and indirect significant adverse impacts associated with the proposed building construction.
- Assessment and evaluation of potential impacts of the proposed project on the human and physical environment.
- Provision of practical, socially acceptable, economical, and technically feasible environmentally sustainable measures to address the potential adverse impacts.
- To ensure that construction complies with all Environmental regulations that constitutes construction in Nigeria.

Benefits of ESMP

The relevance of the ESMP stems from its benefits to both the proponent and the users. To this end, the benefits of this study include:

- Serve as a meeting point for all stakeholders to brainstorm to address the problems, impact and mitigation measures of the proposed road reconstruction project through consultation processes.
- It would serve as a planning and decision making tool that makes for proper accounting and inclusion of socio-economic, health and environmental issues and concerns into project designs and implementation.
- It is a cost saving approach or efforts through the achievement of long-term management objectives and elimination of financial liabilities and environmental risks that are associated with the PUTOR building project

Approach and Methodology for ESMP

The approach and methodology adopted for the ESMP include:

- Bibliographic research / literature review
- Site inspection
- Data collection
- Stakeholder Consultation.
- Reporting.

Relevant Policies, Legal and Administrative Frameworks

Sustainable Development rather than mere development has been the emphasis of every nation, especially since after the Rio declaration in 1992. Thus, all over the world there has been growing awareness on environmental protection, resources conservation and sustainability. Against the foregoing background, various regulatory bodies locally and internationally have made legislations, regulations and guidelines that would enhance environmental protection and sustainability. The Federal and States Ministries of Environment have regulations hinging on environmental protection, restoration and conservation.

Statutory regulations exist which require that a development permit for any new project and those that require the proponent of a major/mandatory project to carry out an ESMP prior to the execution of the project. This ESMP is carried out within the framework of both local and national environmental guidelines and regulations.

The relevant national policies to guide the implementation of the proposed building complex include the following:

Table 1.1 Relevant Regulations Relating to Environmental Protection in Nigeria

S/N	REGULATION	YEAR ADOPTED
1	Explosives Regulations, Cap 117, LFN	1988
2	Federal Environmental Protection Agency Act 1988, Cap. 131, Vol. IX	1991
3	National Environmental Protection (Effluent Limitation) Regulations 1991	1991
4	National Environmental Protection (Pollution and Abatement in Industries in Facilities Producing Waste) Regulations, 1991	1991
5	National Environmental Protection (Management of solid Hazardous Wastes) Regulations, 1991	1991
6	Environmental Impact Assessment Act (Decree No. 86) 1992	1992
7	National Inland Waterways Authority Decree, 1997	1997
8	Guidelines and Standards for Environmental Pollution Control in Nigeria	1991
9	Nigerian communication Act	2003
10	World Bank Safeguards policy.	

Legal Framework

FMENV operates decree 86 (1992) to ensure that environmental issues are given adequate consideration by any organizations or persons embarking on new projects. To assist proponents in attaining the high demand of FMENV for good Environmental Management and Social Management Plan (ESMP), FMENV has published a number of guidelines and regulations. The relevant national laws, legislation and policies aimed at protecting the environment and particularly to guide the preparation of the ESMP for the proposed project include the following:

- ❖ National Interim Guidelines and Standard for Industrial Effluents, Gaseous Emissions and Hazardous Waste Management in Nigeria (FEPA, 1991).
- ❖ National Regulations (S.1 15) for the management of solid and hazardous waste (1991).
- ❖ National Environmental Protection (Effluent limitation) Regulation (S.1. 8, 1991)
- ❖ National Environmental protection (Pollution Abatement in Industries and facilities generating waste) regulation (S.1.9, 1991)
- ❖ Harmful waste (Special criminal provision, etc) decree No. 42, 1988

- ❖ Environmental Impact Assessment Decree No. 86,1992
- ❖ Federal Environmental Protection Agency Decree No. 58, 1988
- ❖ Environmental Impact Assessment procedural guidelines (1995)
- ❖ Environmental Impact Assessment sectorial guidelines for the oil industry (1995). These documents have been consulted and used appropriately in the preparation of this Experiment.
- ❖ Forestry act 1958 controls indiscriminate deforestation
- ❖ Land use decree/Act 1978/79 have provisions guiding land acquisition
- ❖ World Bank Safeguards policy.

Institutional Framework

The protection of the environment is a major priority for the Government of Nigeria, which has led to the establishment of institutions and legal policies to regulate and monitor developments in a sustainable way. The PUTOR Building project will therefore comply with all the legal and regulatory frameworks for environmental management, including the National Policy Framework, Institutional Framework and the World Bank's Environmental and Social Safeguard Policy.

- The National Policy Framework: these are the policies that provide guidelines for the implementation of projects. Such policies include: The Federal Ministry of Environment decree 86 (1992) to ensure that environmental issues are given adequate consideration by any organizations or persons embarking on new projects. The Federal Environmental Protection Agency Act of 1988, with the aim to maintain and develop a pleasant, safe, and clean physical environment for all human settlements.
- The World Bank's Environmental and Social Safeguard Policy: This enables the integration of environmental and social considerations into the development, planning and execution of projects. The project has triggered two of the operational policies, i.e. OP 4.0.1 Environmental Assessment and OP 4.11 Cultural Physical Resources.
- The Institutional Framework: these consists of regulatory institutions that streamline the activities of construction projects. Institutions such as The Physical planning and the Works

and Services Department of the University of Port Harcourt which will help in guiding the successful completion of the project.

Description of Environmental and Social Impacts

The development of buildings and improvement of existing facilities have potential negative effects to the physical environment and social wellbeing of the communities as well as natural habitats. The potential negative impacts from building construction projects could include: environmental pollution from construction activities, risk to health and safety of the residents and employees, demand of construction materials such as water, wood, gravel and hard stones; increased run off, socio-cultural changes including loss of farming land, changes of domestic and wild animals access to water point, demolition of structures, interference with animal reserves and foot paths, increased traffic, increased ambient air pollution, increased potential for road accidents, increased surface run off and associated disasters among other impacts. Other anticipated impacts from the building project will be disruption of natural habitats by interference of food chains and breeding sites and habitats, risks of fatal wildlife attack, displacement or extinction of species, destruction of land, vegetation, introduction of exotic species and possible interference with natural ecological balance, especially within the project area.

In view of the above observation, environmental concerns need to be an integral part of the planning and development process of a project and not an afterthought as it facilitates the proponent to foresee potential project impacts that can be optimized or mitigated. This can be achieved through conduction of environmental and social management Plan and continuous monitoring. The study enables the environmental experts evaluate the current environmental status, opinion of the locals; and establish the potential social and economic benefits of the project. Appropriate remedy is then integrated in the project design and implementation and the effectiveness of the remedy is managed and monitored with the guidance of the Environmental and Social Management Plan.

This however is in line with the National Environmental Impact Assessment (EIA) Decree 86 of 1992 and other Federal and Rivers State Ministry of Environments' regulations and standards,

Activities of potential environmental and social impact identified with the proposed project are outlined under three (3) main phases of project activities; these are the Pre-Construction, Construction and Occupation & Maintenance phases.

Pre-Construction phase impacts

During the pre-construction phase, the main risk is neglect of the environmental and social aspects and their low consideration during the technical studies and/or the preparation of unsatisfactory environmental studies. Furthermore, site selection could include some potential environmental and social concerns and impacts.

Key mitigation measures for these risks will be:

- Public and stakeholder consultation during site selection and preparation and validation of studies.
- Quality control and implementation of validation procedures for environmental studies and their dissemination.
- Regular supervision of the building sites by environmental experts.
- Occupational Health and Safety Issues
- Public Safety Issues.

Construction phase impacts

Construction phase risks and impacts at the construction phase will be site specific and could be a source of inconvenience for workers and all those living or working on the University campus. Of these impacts, the most important are:

Negatives impacts

- Loss of vegetation and impacts on fauna.
- effects on the local microclimate •
- Soil pollution, disturbance, and erosion.
- Air quality deterioration.
- Vibration and noise nuisance.
- Generation and disposal of solid waste.
- Water and sanitation
- Hygiene, health and safety of workers
- Occupational health and safety.
- Risk of spread of COVID19, respiratory and skin infections
- Public Safety issues
- risk of grievance and conflict

Positives impacts

- Increased and improved economic activities around the project site
- Temporary employment opportunity, business opportunity

Occupation & Maintenance phase

During the occupancy and maintenance phase, PUTOR project activities should not pose any environmental or social problems. Potential negative impacts might generally be due to:

Negatives impacts

- Waste management and disposal

- Fire hazards
- Emission of bad odors
- Early degradation of the building due to misuse and lack of maintenance
- Public health and safety
- Occupational health and safety
- gender-based violence and sexual harassment
- Risk of spread of COVID19, respiratory and skin infections
- Failure to take account of vulnerable people (disabled students, etc.) risk of grievance and conflict

Positive impacts

- Improvement of the aesthetics of the university site/ACE
- Development of green spaces around the building
- Increased economic activity around the university/ACE
- Improved student comfort and study conditions
- Employment opportunity, business opportunity
- Asset on the higher education system at national level

Environmental and Social Monitoring Plan and Reporting

Environmental monitoring is an essential component to ensure the successful implementation of the ESMP. The environmental and social monitoring plan proposed for the implementation of the ESMP for the PUTOR building project is outlined in this report to track the implementation of the mitigation measures for the identified impacts.

Grievance Redress Mechanisms

The establishment of Grievance Redress Mechanisms will provide the procedures by which a resolution to a grievance is sought. A team will be put in place to ensure that complaints from affected persons are promptly addressed in a manner that is fair and acceptable to all parties in an amicable way to avoid or minimize litigation.

Estimated cost of the project

The project is expected to cost Eight hundred and fifteen thousand, eight hundred and thirty-five dollars (\$815,835.000). The World Bank is the main financier of the project.

2.0 INTRODUCTION

2.1 Project Brief

PUTOR is a World Bank funded African Centre of Excellence for Public Health and Toxicological Research for higher education established in the year 2018 through funding from the World Bank, PUTOR Centre is within the University of Port Harcourt with the purpose of providing interdisciplinary academic stream of postgraduate programmes and rapidly bridge the current paucity of adequately trained personnel with terminal degrees in public health, toxicology, nutrition and midwifery/child health nursing in sub-Saharan Africa. The Faculty of Basic Medical Sciences, Dentistry and Biomedical Sciences, University of Port Harcourt (UPH) proposed establishing the Centre to address the need for man power development in Child health Nursing, public health and toxicology which is a major development challenge in this region of the world as well as enhance capacity especially in nutrition disorders.

The PUTOR Building Complex will consist of state-of-the-art classrooms, offices and laboratories which will support the overall vision of PUTOR which is to:

- Groom a class of Midwifery/Child health Nurses, public health specialist and toxicologist with superior skillsets
- Maintain high academic standards of teaching and research
- Support research efforts of faculty, students, and partners to enhance collaboration
- Share comprehensive research findings
- Transform findings into innovative health care solutions.

The building project has an estimated duration of 12 months. The project is expected to Eight hundred and fifteen thousand, eight hundred and thirty-five dollars (\$815,835.000). The World Bank is the main financier of the project. The main stakeholders of the project are:

- PUTOR: The client

- Machris Consults Nigeria Limited: Project Consultants (project managers)
- A contractor who will be selected through a national competitive tender.

The construction works are classified into three main phases, the structural framework, finishing works and external works. Activities under each phase is summarized in the table below.

Table 2.1: Construction Activities

Phase	Task / Project Activities
Structural Framework	Substructure works: this includes clearing of the project site, excavation of the earth for the building foundation, disposal of excavated materials from the site, filling to make up levels, laying of foundation blocks and concrete and reinforcement works for the foundation.
	Blockwork: laying of blocks for the building frame
	Concrete works: this includes all reinforcement works for columns, beams and walls, formwork to cast columns, beams and wall concrete, and pouring of concrete in columns, walls and beams.
	Roof Carpentry and Covering: this includes timber members to be used for carpentry and installation of roofing sheets.
Finishing works	Joinery works: this includes installation of doors and other partition works
	Glazing works: this includes installation of glazed windows and frames, glass partitions and glass doors.
	Wall finishes: this includes plastering, wall tiling and painting works.
	Floor finishes: this includes screeding of floors and floor tiling works.
	Ceiling finishes: this includes installation of plasterboard ceiling finishes for the general spaces, acoustic ceilings for the reception and auditorium areas.
	Furniture and equipment: this include the installation of laboratory benches, office work stations and furniture etc.
	Plumbing and Electrical fixtures: this includes all pipe works for electrical and plumbing works, electrical wiring, installation of sanitary appliances and installation of electrical fittings.
External Works	Horticulture and landscaping works: this includes planting of trees and shrubs, planting of grass and flowers. Waste Disposal: this includes the construction of soak-aways and Cesspools for the disposal of soil and liquid waste, provision of dedicated bins for refuse disposal.

The PUTOR Project Development Objective is to improve the quality, quantity, and development impact of postgraduate education at the University of Port Harcourt, through regional specialization and collaboration in toxicological research, Public Health emergencies, Mid Wifery and Child Nursing.

Expected results include:

- To provide training in toxicology and environmental health that would enable the postgraduate students identify the risks to health in the environment and abate the identified health hazards in the environment;
- To provide training in midwifery and child health nursing that would assist in improvement in the health of mothers and children and support delivery of highly skilled professional services to oil/gas communities through applied research;
- To provide training in health systems strengthening that would aid evidence synthesis and focused research needed to address a wide range of conditions, health behaviours, and health systems indicators that arises from oil and gas industries;
- To provide opportunities for advanced study and innovations in basic and applied human nutrition including better understanding of socio-cultural effects on diet, the impact that living in "food deserts" could have on good health, and to educate the women on how to make good food choices from the food items available in the community to ensure adequate nutrition and optimal health for women and children;
- To adapt this training in public health, toxicology, human/community nutrition and nursing to the needs of the industry, the diverse backgrounds and anticipated future careers of the students;

The PUTOR building complex will be a functional unit consisting of laboratories, classrooms, seminar rooms, an auditorium and office spaces. Several environmental management plans will be implemented throughout the pre-construction, construction and operational phases of the building.

These will include the following:

- Identify and evaluate the environmental and social impacts (positive and negative) of the project on the components of the biophysical, socio-economic and human environment.
- Identify and characterize all the ecological, socio-economic and human issues that characterize the project's area influence.
- General Health, Safety, Environment and Social Procedures - Measures to adhere to the various Health, Safety, Environment and Social rules and regulations in Nigeria and especially the University of Port Harcourt policy on environmental health and sanitation, to prevent accidents against workers engaged in construction, handling of tools and equipment, transportation of materials and protection of occupancy during operational stages.
- Pollution Prevention - Monitoring of Waste Management (Solid and Liquid), water supply, sewage, and oil spillage will be checked critically.
- Monitoring Plans - Measures to identify future environmental impact will be implemented during the Pre-Construction, Construction and Occupation Phase. Activities to be monitored include Vegetation clearing, air pollution, noise, traffic, occupational health and safety.

The key success to the implementation of this ESMP will depend on adherence to capacity building and training of staff and all members involved. The ESMP shall be a controlled document and subject to update during the implementation of the project in response to any reported incident.

2.2 Proposed Design of The ACE PUTOR Building Complex



Plate 2.1: Front View of ACE PUTOR building Complex

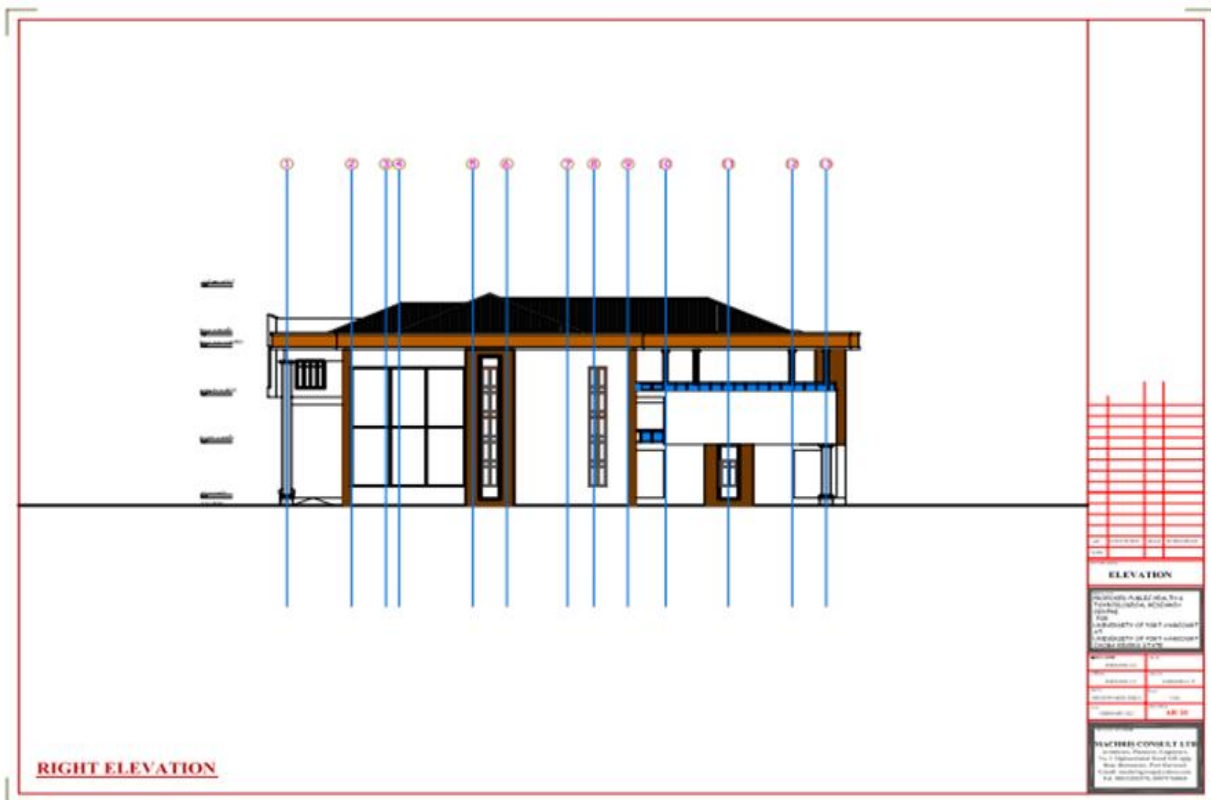


Plate 2.4: Right View of ACE PUTOR building Complex

2.3 Approach and Methodology

The approach and methodology adopted for the ESMP include:

- Bibliographic research / literature review
- Site inspection
- Data collection
- Stakeholder Consultation.
- Reporting.

2.3.1 Bibliographic research / literature review

The following project related document was reviewed for the drafting of the ESMP:

- Final Environmental and Social Management Plan (ESMP) for the construction of WAGMC building complex, University of Ghana, January, 2022.
- Environmental Impact Assessment for the Construction of Internal Roads in Isiokpo, Ikwerre Local Government Area of Rivers State (EIA) March, 2021.
- Environmental Impact Assessment for the Construction of Ikwerre Local Government Area Council Secretariat at Isiokpo, Rivers State (EIA) September, 2020.

- AAU Environmental and Social Management Framework (ESMF), Revised version 28 November 2018.

2.3.2 Site Inspection

The objectives of the site inspections included:

- The observation of the physical characteristics of the proposed construction sites and their immediate environs.
- Identification of potential affected people and land use.

The site which has a total 7597.964sqm, is located on the University of Port Harcourt Campus in Choba, Port Harcourt Nigeria. It shares its boundaries with Institute of Petroleum Studies Students Hostel (on the left), University of Port Harcourt proposed building centre (on the right), and a Forest behind the proposed site as well as the East –West Road which is the major link into the proposed building site.

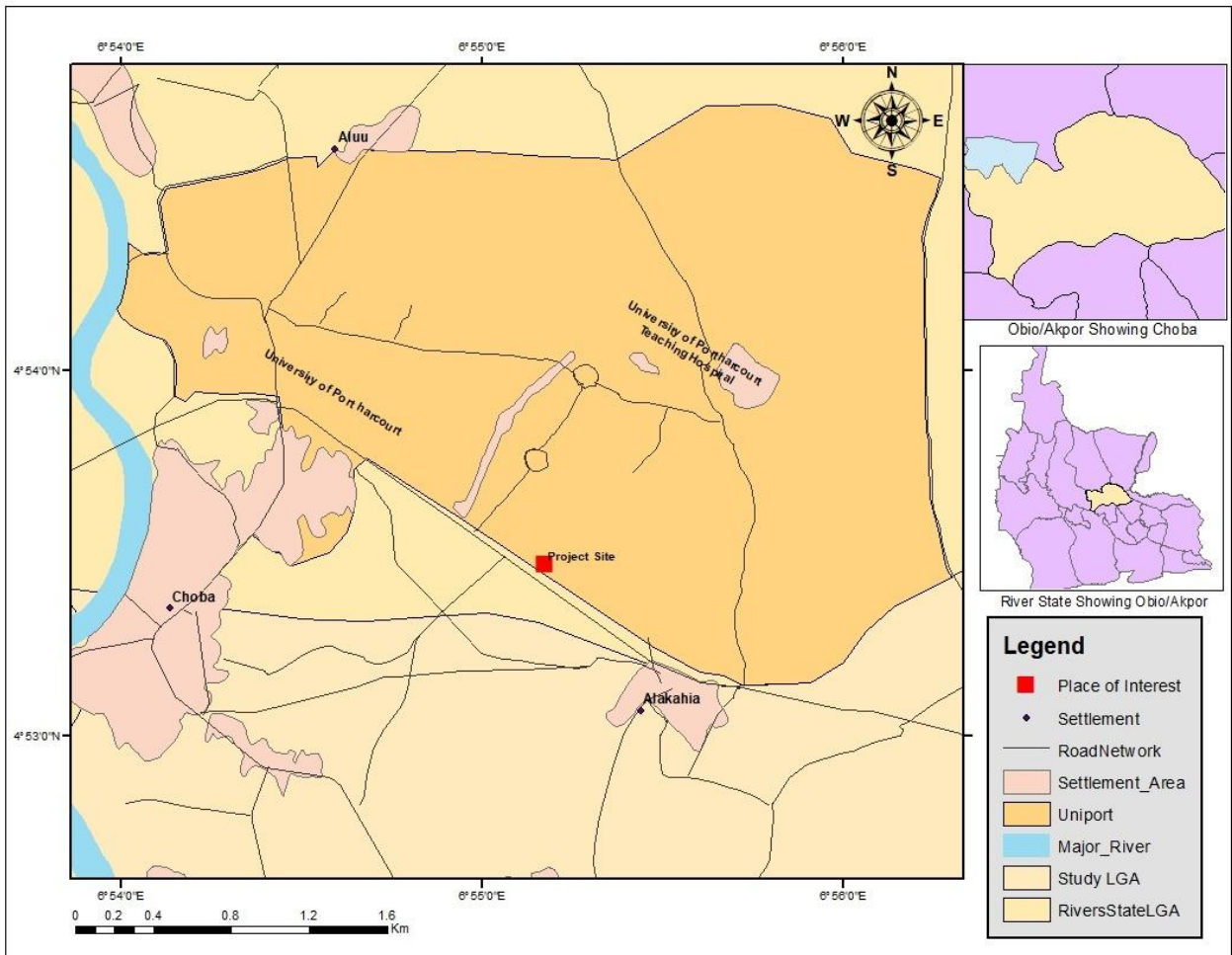


Figure 2.1: University of Port Harcourt, showing Project Site

The site is geographically located between Latitudes 4° 53' 28" to 4° 53' 38" N, and Longitudes 6° 53' 28" to 6° 55' 10" E. The following observations were made on the site:

- Trees and shrubs.

University Hostels along the road before the project site will not be directly affected by the project, however in the event of over speeding construction trucks and breakdowns, they may pose dangers to students and hinder traffic movements. Measures will be put in place in the ESMP to regulate the movement of construction trucks and vehicles.



Figure 2.2: Google earth location of the proposed site bounded in Red



Plate 2.4 State of the Site before the project



Plate 2.5: Display of abundance of Shrub's at the project Site

2.3.3 Stakeholder Consultations

Stakeholder consultations were carried out with key stakeholders to obtain their comments and concerns on the proposed project with respect to the potential environmental and socio-economic issues and impacts (as detailed in section 2.2.1). The PUTOR Project defined and adopted a

comprehensive and balanced approach to social mobilization and stakeholder engagement. A plan was developed to involve the active participation of all stakeholders in decision-making processes, to foster dialogue and reduce tensions.

The key project stakeholders were identified for consultations, and these included the following:

- University of Port Harcourt (UPH) ACE PUTOR Centre
- Physical planning/ works and services department.
- Project consultants

The stakeholder consultation meeting was held on Wednesday 17th November 2021, which involved a team inspection for the PUTOR building complex construction project and a meeting to address all issues that may be of concern to the main stakeholders. The Environmental and Social Safeguards Officer chaired the meeting and explained that the goal was to develop and maintain open and constructive relationships with all stakeholders, to facilitate the management of the project and its stakeholders, including their environmental and social effects and risks. After initial introductions, the Environmental and Social Management Framework (ESMF) was presented and discussed with all stakeholders.



Plate 2.6 Stake Holders having an Interactive session at the proposed project Site

Participants of the stakeholder consultation meeting held on Wednesday 17th November 2021, were as follows:

Name	Institution	Position
Prof Daprim Ogaji	PUTOR	Centre Leader
Dr. Anthonet Ezejiofor	PUTOR	Safe Guard Officer
Dr. Faith Diorgu	PUTOR	Liaison Officer
Engr. Nicholas Abule	Works /PUTOR	Procurement Officer
Mr. Francis Okocha	PUTOR	Auditor
Dr. Chukwu Okeah, Gift.O	Machris Consults Nigeria Limited	Environmental Consultant
Dr. Kingsley Patrick - Anyanwu	PUTOR	Monitoring/Evaluation Officer
Mr.Uchenna Otamiri	PUTOR	Technical Officer

A total of 2 women were involved in the stakeholder meeting, i.e., Dr. Anthonet Ezejiofor, the Safeguards Officer and Dr. Faith Diorgu, the Centre Liaison Officer.



Plate 2.7 Stake holders at the entrance to the project Site by East West Road Choba.

2.3.3.1 Objectives of the consultation

The key objective in having all stakeholders involved in the pre-construction phase of the project is to ensure that any proposed environmental and social issues affected by work activities are identified with their proposed mitigation plans.

The consultations seek to achieve the following objectives:

- To provide information about the proposed project.
- To provide opportunities for stakeholders to discuss their concerns and offer recommendations.
- To provide and discuss with stakeholders the alternatives considered to reduce anticipated impacts.
- To identify and verify significance of environmental, social and health impacts.
- To inform the processes of developing appropriate mitigation and management options.



Plate 2.8: Stake Holders at a discussion at the project Site

2.3.3.2 Summary of Concerns Raised by Stakeholders and proposed Mitigations at the meeting

During the stakeholder consultation meeting, the following concerns were raised by stakeholders and mitigation measures were proposed to address such concerns:

- The need for another entrance into the project site through the IPS hostel and adjoining forest. It was established that University of Port Harcourt was already embarking on marking the provision of the alternative route.
- The closeness of Scavengers to the project was also noted. It was established that before the completion of the project the Physical Planning Department of the University was to move them out of the area as the area still falls within the University of Port Harcourt Property.

2.3.4 Reporting

The major headings of the report include the following:

- A. Executive summary
- B. Introduction
- C. Institutional and Legal framework
- D. Description and analysis of the initial state of the environment
- E. Description of Environmental and Social impacts of the project
- F. Environmental and Social Mitigation management plan
- G. Environmental Management Structure
- H. Conclusion
- I. References
- J. Annexes

3.0 INSTITUTIONAL, POLICY AND LEGAL FRAMEWORK

The protection of the environment is a major priority for the Nigerian Government, which has led to the establishment of institutions and legal policies to regulate and monitor developments in a sustainable way. The PUTOR Building project will therefore comply with all the legal and regulatory frameworks for environmental management.

3.1 National Policy Framework

The relevant national policies to guide the implementation of the proposed building complex include the following:

- The National Environmental Policy (2013): This policy aims to ensure sound management of resources and the environment to avoid any misuse of these resources in a way that might cause irreparable damage to the environment. The objective of this policy is to ensure that the requirements of environmental impact assessments are met in order not to undertake activities that affect the quality of the environment.
- The National Environmental Sanitation Policy (2010): This policy aims to maintain and develop a pleasant, safe, and clean physical environment for all human settlements and developments.
- The National Urban Policy Framework and Action plan (2012): This plan aims to promote sustainable development, promote urban economic development, ensure effective management of urban growth, and ensure urban infrastructure and service delivery.

3.2 World Bank Environment and Social Policies

World Bank projects are guided by Environmental and Social Safeguards Guidelines and Operational Policies. This enables the integration of environmental and social considerations into the development, planning and execution of projects. These were used as a guide to support PUTOR's environmental and social (E&S) risk management.

Every project is subject to a preliminary environmental and social review based on the type, location, degree of sensitivity, scale, nature, and extent of its potential environmental and social impacts, which is class in one of the following categories:

- (a) **Category A:** Project that is likely to have a negative, nerve, diverse or unprecedented impacts on the environment.
- (b) **Category B:** Project whose adverse effects on the population or areas of environmental importance (land, forests, and other natural habitats, etc.) are moderate.
- (c) **Category C:** Project whose likelihood of negative environmental impacts is considered minimal or zero.

The PUTOR project is classified as “category C” because its adverse effects on the population or areas of environmental importance are minimal, site specific and likely reversible, and mitigation measures can be more easily designed/ implemented.

Among all the World Bank environmental and social safeguard policies, *two Operational Policies and Bank Procedures (BPs) were triggered* under the PUTOR Project. i.e. *OP 4.01 Environmental Assessment* and *OP 4.11 Cultural Physical Resources*.

A summary of the World Bank Policies and potential triggers for the PUTOR project are presented in Table 3.1 below.

Table 3.1: Summary of World Bank Policies and potential triggers for the PUTOR project.

No.	World Bank Safeguard Policy	Summary of core requirement	Potential Trigger under proposed project	Remarks or recommendation for proposed project
1	OP 4.01 Environmental Assessment	Requires environmental assessment (EA) of proposed project for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. EA considers the natural environment (air, water, and land), human health and safety, social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources) and trans	Triggered because the project activities such as site clearing and excavation will impact the air, water, and land.	1. Assessment, management and monitoring of the environmental and social risks and impacts of the project throughout the project lifecycle to meet the requirements of the policy.

		boundary global environmental aspects. Projects are categorized into A, B, C or FI based on the extent of adverse impacts anticipated from the project. For category A and B projects an ESMP is to be prepared to guide the implementation of mitigation measures for all identified environmental impacts from the proposed project.		2. Develop the ESMP and implement all measures set out in the plan, conduct monitoring and reporting on performance of the plan.
2	OP 4.04: Natural Habitats	Do not finance projects that degrade or convert critical habitats. Supports projects that affect non-critical habitats only if no alternatives are available and if acceptable mitigations are in place. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats.	Not triggered	Project location and design will not affect any critical habitats.
3	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.	Not triggered	Project will not involve the use of any pesticides.

4	OP 4.36: Forest	Aim is to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development. Support sustainable and conservation-oriented forestry. Do not finance projects that involve significant conversion of degradation of critical forest areas.	Not triggered	Project location and design will not affect any forest areas.
5	OP 4.11: Physical cultural Resources	Investigate the inventories cultural resources potentially affected. Include mitigation measures when there are	Triggered because the project will involve major	1. Assessment, management and monitoring of the environmental and

		adverse impacts on physical cultural resources or avoid if possible.	excavations, earthworks, and environmental modifications.	social risks and impacts of the project throughout the project lifecycle to meet the requirements of the policy. 2. Develop the ESMP and implement all measures set out in the plan, conduct monitoring and reporting on performance of the plan.
6	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 minimize. The policy aims to avoid involuntary resettlement or to minimize and mitigate its adverse social and economic impacts. The policy prescribes compensation and other resettlement measures to achieve its objectives.	Not triggered	Project location and design will not cause any Involuntary Resettlement.
7	OP 4.10: Indigenous people	Screen to determine the presence of indigenous peoples in project area. Policy triggered whether potential impacts are positive or negative.	Not triggered	No indigenous groups were identified

8	OP 4.37: Safety of Dams	Requires that experienced and competent professionals design and supervise construction, and that the borrower adopts and implements dam safety measures through the project cycle. The policy distinguishes between small and large dams by defining small dams as those normally less than 15 meters in height. Large dams are 15 meters or more in height.	Not triggered	The proposed project does not involve the construction of dams.
9	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.	Not triggered	The proposed project does not involve international waters.
10	OP 7.60: Projects in Disputed Areas.	Ensure that claimants to disputed areas have no objection to proposed project.	Not triggered	No issues of Land dispute were identified.

3.3 Institutional Framework

Construction of building projects are guided by the ministry of works and housing, through the various municipal assemblies and other state agencies that help in the protection of the environment by regulating project activities. The following are the main regulating institutions:

- University of Port Harcourt (UPH):** The UPH is represented by the **Physical Planning and Works and Services Department** which is the main regulatory body in charge of project developments in the university.
- The Ministry of Education:** The Ministry of Education is responsible for all policies on education, including apprenticeships and wider skills acquisition in Ghana.
- Federal Ministry of Environment Environmental Protection Agency (FMENV):** The EPA regulates Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) procedures. The objective of the Agency is to ensure the compliance of good practices and seek co-operation from entities whose activities could potentially cause harm to the environment.

3.4 Legal Framework

With respect to the legal framework, Nigeria Possess several policies aimed at protecting the environment. Whole or partial sections of these policies relate directly to construction works:

The basis of environmental policy in Nigeria is contained in the 1999 Constitution of the Federal Republic of Nigeria. Pursuant to section 20 of the Constitution, the State is empowered to protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria. In addition to this, section 2 of the Environmental Impact Assessment Act of 1992 (EIA Act) provides that the public or private sector of the economy shall not undertake or embark on or authorize projects or activities without prior consideration of the effect on the environment.

The Federal Government of Nigeria has promulgated various laws and Regulations to safeguard the Nigerian environment. These include:

- Federal Environmental Protection Agency Act of 1988 (FEPA Act) which was later changed to National Environmental Standards and Regulations Enforcement Agency (NESREA), which was established in 2007 to replace FEPA;. The following Regulations were made pursuant to the FEPA Act:
 1. National Environmental Protection (Effluent Limitation) Regulations;
 2. National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations; and
 3. National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations.
 4. Environmental Impact Assessment Act of 1992 (EIA Act).
 5. Harmful Wastes (Special Criminal Provisions etc.) Act of 1988 (Harmful Wastes Act)
 6. National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN) 2011.

7. National Biodiversity Strategy and Action Plan (NBSAP) 2016.
8. National Policy on Environmental 2016.
9. National Climate Change Policy and Respond Strategy (NCCPRS) 2012.
10. National Water Policy (2012);

3.5 Comparing National Procedures and World Bank Policies

Observing both policies, it can be identified that Ghana's environmental and social management system and that of the World Bank **share similar views**. All laws, regulations and instruments governing investments and activities in the natural resources sector are generally consistent with the World Bank procedures. **In terms of gaps and differences**, recent WB assessments have pointed out the quality of the interactions existing between EPA and WB regulations, the EPA having demonstrated willingness and abilities to undertake in-depth, technically-sound reviews and provided authoritative guidance, and used conditionality effectively in administering the environmental permitting process. In the event of policy discrepancies, the World Bank Policies will override national policies and regulations.

4.0 DESCRIPTION AND ANALYSIS OF THE INITIAL STATE OF THE ENVIRONMENT

This section of the report puts together the baseline environmental data/characteristics of the study area. For the purpose of baseline data acquisition, an integrated and interdisciplinary team of professionals and practitioners were engaged. The team as a formidable one is made up of seasoned environmental and social practitioners with adequate training and experiences. The various areas covered in course of this study are: **Air quality, Soil, Hydrogeology, Noise, Meteorology, Vegetation and Socio-economics.** Geographic information systems (GIS) expert was engaged in the mapping of the sites and data generated alongside.

Data collection for this ESMP study commenced with a formal forum with the various stake holders likely to be impacted by the proposed project. The formal interactive forum began on 17th of February, 2022. However, the actual sampling began on the 20th of February, 2022. An environmental baseline study was carried out to establish a benchmark of existing environmental conditions in the proposed project site prior to the commencement of the project against which potential impacts of the planned project on the site could be assessed. Thus, the data presented and information given was gathered from a combination of both primary and secondary sources. That is, field observation and laboratory analyses as well established facts in literature derived through literature review process. The data presented here were analyzed in line with national and internationally acceptable standards.

4.1 Air Quality

An *insitu* study of the air quality and noise level of the site for the PUTOR building project was carried out on the 24th of November, 2021 to provide a baseline data for the environment that will form a future reference for the proper comparison of the effects of the project in the environment. Three locations were strategically selected for the air quality study to give a good representation and coverage to the project communities that will likely be impacted by the project.

Air quality parameters namely, carbon II oxide(CO), hydrogen sulphide (H₂S), Oxygen(O₂) and Nitrogen oxide(NO) were measured using M40 multi-gas monitor and Carbon IV Oxide(O₂) was measured using the dragger shut-term detector. The ambient suspended particle matter (SPM) level was sampled with a Hi-Vol. Sampler with its accessories, such as a vacuum pump and a portable power generator. The sampling was followed by a gravimetric analysis.

The results of the air quality survey are presented in the table below.

Table 4.1: Air quality Result in the proposed project area

S/N	Location	O ₂ (%)	CO	No _x (ppm)	SO _x (ppm)	H ₂ S (ppm)	VOC	SPM (Ug/m ³)
1.	Main project site	20.9	0.00	ND	ND	00.0	ND	5.6
2.	Alakahia Junction	23.02	0.0	ND	ND	00.0	ND	26.5
3.	IPS Gate	20.03	00	ND	ND	00.0	ND	19.2
FMEV Standard Limit		-	10	25/113p pm	0.01 Ppm	-	-	600

Legend: ND = Not Detected.

Air quality is a major problem in the developing world. Especially in the Niger-Delta region of Nigeria with several gas flaring stations, this problem is very noticeable. Air pollutants could result from stationary and mobile sources, which are mainly from combustive engines.

There appeared to be no effect of CO in the environment as at the time of sampling. Usually, CO is produced by the incomplete combustion of fossil fuels and it has the ability of impairing the oxygen - carrying capacity of the blood when inhaled in excessive quantities. The value of nitrogen oxide, Sulphur oxide and VOC and CO₂ were not detected in the project as notable sources of these gases such as coal and combustion of Sulphur and nitrate bearing fuels and ores were absent. It therefore implies that the area is free from these gases. However, these gaseous components of air are expected to be released and increased from fuel combustion engines during the construction and operational phases of the project, but may not impact the environment with the use of modern technology.

The range of the suspended particulate matter (SPM) is 5.6 to 26.5 (Ug/m^3). These values indicate that the atmosphere is not loaded with particles as there are no major sources of particles in the environment. Also, the continuous rainfall at the period of sampling may have washed the atmosphere of any suspended particles. Usually, excessive exposure to SPM initiates respiratory diseases and can cause cancers, damage lung tissues and destruction to plant life. High values in the atmosphere can cause smog and haze. Generally, the state of the air quality at the time of study is found to be fair and the atmosphere could be defined as under-graded.

4.2 Soil

The linear sampling method was employed for this hydro-geologic survey to localize the soil samples retrieved and to cover the whole site of investigation. Soil samples were retrieved for lithologic description and laboratory testing.

The terrestrial environment studies of the site for the ACE PUTOR project include soil studies within and around 50m square radius from the proposed project site. Random soil samples were collected from the project environment and from areas outside the site. Three soil samples properly were collected at an interval of about 50m apart. Composite samples (Surface (TOP) and Bottom layers) were collected at different depths according to environmental guidelines and standards.

The result showed that three distinct soil layers were encountered at the project site within the limit of the borings and comprised of Brown, Stiff –soft clay layer (CH), Brown Clayey sand layer (SC) and Brownish poorly grade sand layer (SP).

For the brownish, Stiff –soft clay layer (CH) indicates that the soil is of moderately low permeability, for the brownish clay sandy layer (SC) the soil is semi permeable, the sand fine medium coarse (SP) are poorly –well graded sand is permeable.



Plate 4.1: Soil type in the area

4.3 Hydrogeologic Assessment

The project site lies on a thin layer (<15m) Recent Niger Delta alluvium made of sands, silts and clays lying conformably on a massive deposit of continental fluvial material (the Recent Coastal Plain Sands) of the eastern Niger Delta. Its surface geology consists of weathered overburden material consisting of fluviatile deposits transported by probably the Sombreiro river system and the Niger River distributaries. These materials have a general thickness of over 300 metres consisting of mainly coarse grained sands and layers of silts, clays and gravels. These sediments otherwise called the Benin Formation exhibits massive continental sands overlying an alternation of sandstones and clays of marginal marine origin. Sands, by far, form the largest group of rock types in the region and this act as the water bearing strata, due to their high porosity and permeability.

The area has a well-developed or massive drainage network; this is due to the nearness of the project site to the New Calabar River drainage area, which runs through the heart of the project area and crosses other communities into the New Calabar River System.

4.4 Noise level

The EXTECH Digital Sound Level Meter (Model 407750) was employed for the *insitu* measurement of the ambient noise levels weighed on the Scale. The noise pollution levels (Lnp) were computed using the relation (Abumere et al, 1999).

$$L_{np} = L_{eq} + 2.56 \sigma$$

Where L_{eq} is the mean noise level and σ is the standard deviation which is 4.7dB for noise measured

Table 4.2 Noise Level across the project Area

S/N	Sampling Station	Mean Noise (dBA)
1	Institute of Petroluem Studies Hostel	55.3
2	Christ Embassy Church Choba	38.9
3	Alakahia Junction	63.4

Source: Field report (2021)

An average noise pollution level (Lnp) of 52.5 dB (A) was obtained for the area. However, there were periodic rise in the noise level due to activities of motor cycles, motor vehicles, and other vehicular traffic as well as mini industrial activities in the area at the time of sampling. Noise values obtained are comparable with the previous noise level survey of Port Harcourt metropolis (Abumere et al, 1999, Obafemi, 2006). The noise level of the project site is comparatively lower, when compared with the FMEV recommended value of 90dBA for 8 hours (FEPA, 1991). However, the noise level of the project area is expected to rise mainly during the site-clearing and construction phases to be occasioned by heavy-duty vehicles as well as other machines that will be engaged during these phases. This will only have a transient effect. In any event, the noise values obtained for the study area are within the reported ranges for the Niger Delta area (NDES, 1999), and may not induce serious psychological and physiological effects on the human population in the area.

4.5 Micro-Meteorological Data

The role of meteorology in an environmental set up cannot be over emphasized. In a building project such as this, meteorological information such as the wind speed and direction, temperature and

rainfall characteristics become fundamental in determining the impact and possible mitigation measures. In the city of Port Harcourt and proposed project location in particular, the climatic condition is influenced by cyclical and maritime variations. High temperatures, humidity and rainfall characterize the proposed project site for most part of the year. The climate which is tropical humid, is characterized by wet and dry seasons. The dry season starts around November and ends in February and March; the wet season on the other hand, occurs between March and November. The mean data of these variables were calculated and shown below.

4.5.1 Temperature

Temperature is generally over Port Harcourt region all the year round. Existing literature reveal that there is a monthly mean maximum of 32⁰C, while monthly mean minimum is 26⁰C during the wet season and 30⁰C during the dry season. However, our field study reveals a little derivation with a slight increase of 30⁰C minimum during the wet season and 32⁰C in the dry season.

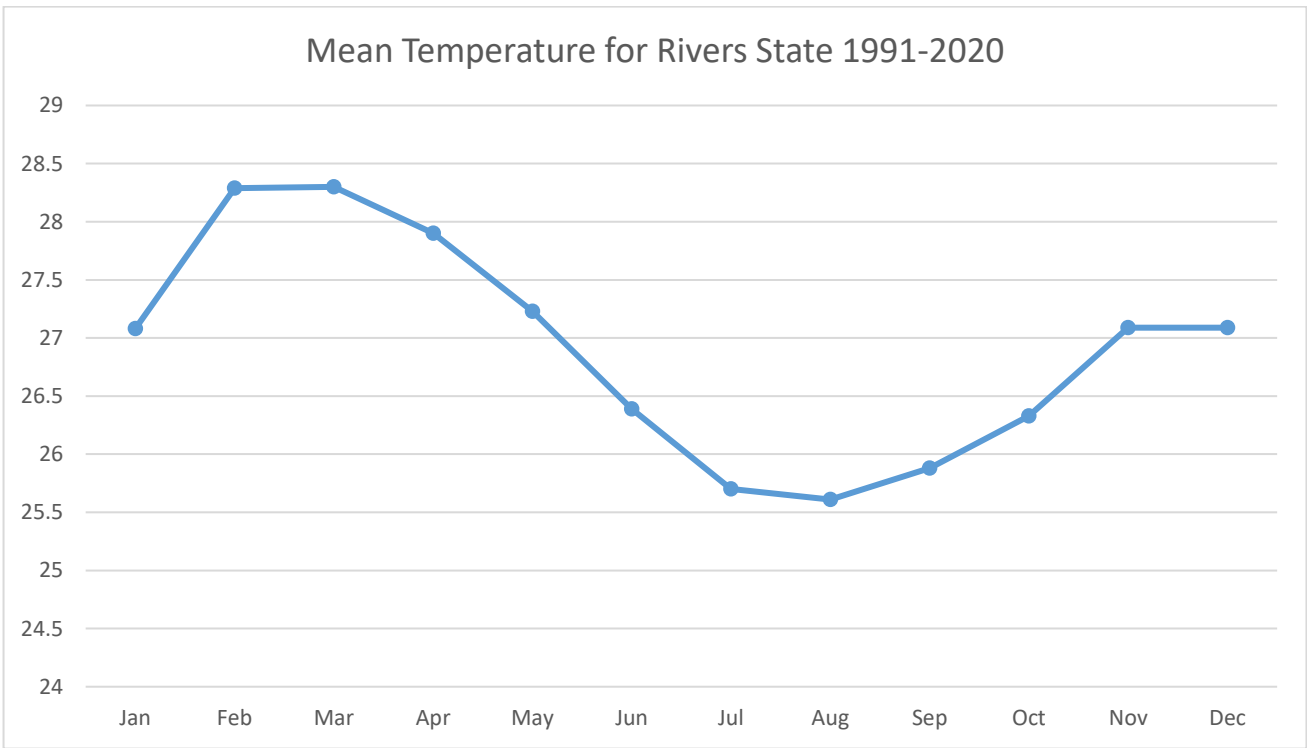


Fig 4.1: Mean Temperature for Rivers State 1991-2020

Source: Mean temperature of Nigeria from 1991-2020, Source: World Bank Climate Change Knowledge Portal

4.5.2 Rainfall

Another important climatic variable, which brings about seasonal variation and ecological imbalance in the climate of Port Harcourt region, is the rainfall. The mean rainfall of this area is 2,650mm with no visible dry spell. In fact, the area experience heavy rainfall almost in all months of the year. However, the frequency decreases during the dry season.

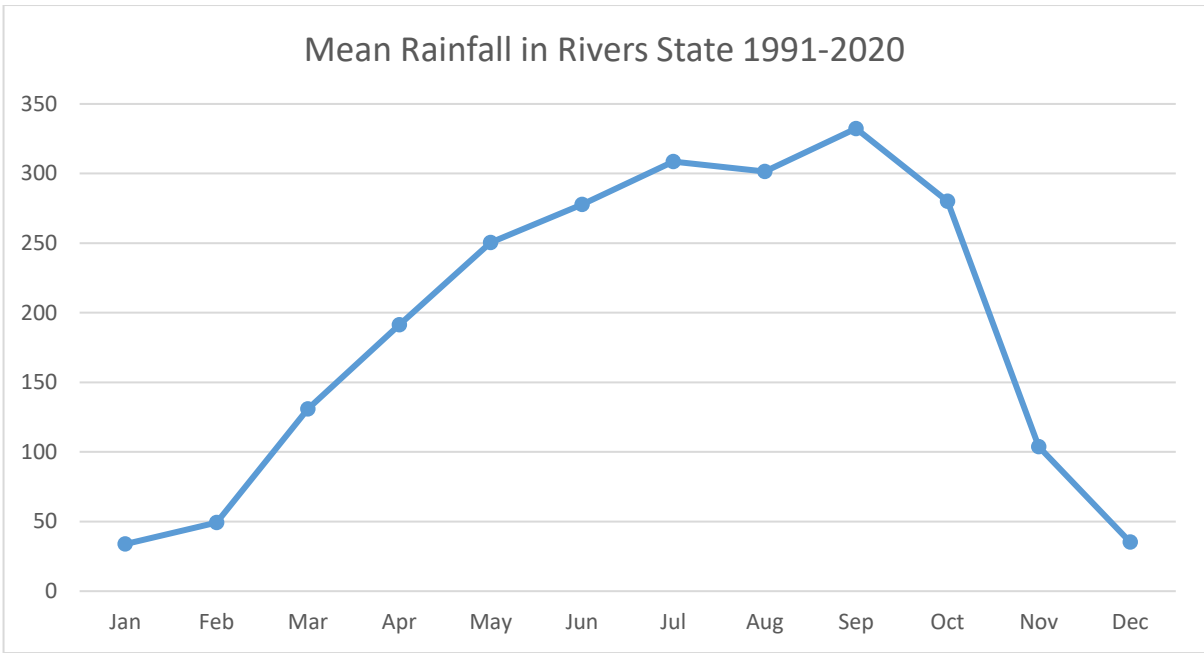


Figure 4.2: Mean Rainfall in Rivers State 1991-2020

Source: Mean Rainfall of Nigeria from 1991-2020, Source: World Bank Climate Change Knowledge Portal

4.5.3 Relative Humidity

The mean relative humidity is determined by the rate of evaporation and wind speed of a particular place in time. The average relative humidity at the project site is 72.3%, with 80.5% and 48% being the maximum and minimum respectively. The higher the relative humidity, the lower the wind speed and also the higher the clouds cover. This is owing to the location of the project site in the thick rain forest of the Niger Delta region, Nigeria where one can hardly find any area with low relative humidity.

4.5.4 Wind Pattern – Speed and Direction

Wind in the study area blows from the South West and occasionally Southeast during the rainy season. In Port Harcourt region wind blows from the South-West except for parts of the dry season

when Northerly wind predominate. Our data collected on the field show that winds in the area are characterized by low speed with an average of 3.6mph from South Westerly direction. The maximum speed during the period of study being 5.2 mph, this could be explained by the dense vegetation cover that acts as windbreakers.

4.5.5 Cloud Cover

The cloud is relatively clear and constant because of the presence of the evergreen tree canopies of the tropical rainforest.

4.6 Vegetation Studies

This study was instituted to establish the baseline status of the vegetation of the proposed project locations. To establish the vegetation of the project area, fieldworks were carried out on the 22nd and it was found that the forest ecosystem is the predominant ecosystem in the area with grasses and shrubs in abundance.

4.7 Socio-Economics

This section of the study/report entails a detailed study of the social and economic life of the people amidst the development in the area.

To achieve this, data were collected and analyzed in the following areas, Population Description, Settlement Patterns, Industrial Activities and Employment Opportunities.

4.7.1 Data Collection

Three methods of data collection were adopted for this study; this includes;

- Observation and
- The use of questionnaire

The population of the ownership of the project area is culturally homogenous, hence the use of simple language in discussions and interaction.

Focal group discussions were held in University of Port Harcourt which is the major identified project community, although the University has two Major Host Communities within the Proposed project area, which are Choba and Alakahia Communities. In depth interview sessions were held intermittently in each of the project community. The observable physical features in the community such as Economic activities, building types, forest and roads were recorded.

4.7.2 Population Description

The results of the 2006 population census of communities in the project area by male and female will not give a good estimate as the population of the area has grown so much as a result of drift from rural to urban centre of which the study communities are part of.

4.7.3 Settlement Patterns, Housing Structures and Characteristics

The settlement pattern observed in the communities revealed both a linear and nucleated pattern of settlement but with formal planning set up.

The analysis of the study revealed that in all the communities, individual housing units are built in a variety of ways and form. See table 4.20 below.

Table 4.3: Housing types in the Project Area

S/N	Housing Type	Percentage
1	Vibrated blocks and Corrugated sheets	94.1%
2	Wooden walls, zinc walls and Zinc roof	6.9%
	Total	100

Source: Filed Work Report (2021)

Interestingly, buildings in the communities are dominated by brick/vibrated block walls and corrugated sheets roof and some storey buildings are also seen in the proposed project area, plastered with cement and in most cases have electricity and modern toilet facilities.

4.7.3 Industrial Activities and Employment Opportunities

Choba and Alakahia communities which houses this project area in the University of Port Harcourt, have in abundance mini industrial activities going on it. Observations revealed that many of them are one man businesses which are in abundance.

Both communities have market which runs daily meaning. This however gives opportunities to women who are into petty trading. Employment opportunities abound in the communities due to the presence of mini industries. There also exist good numbers of privately owned schools which gives opportunities for employment of qualified persons as teachers and janitors from the project communities and the presence of the University of Port Harcourt is a major employment attractor.

5.0 DESCRIPTION OF ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROJECT

Concerns expressed by stakeholders during consultations, field inspections and observations, as well as project descriptions and designs, served as the foundation for the identification of potential environmental issues and impacts associated with the proposed building project.

5.1 Project Area of Influence

The area of influence of the proposed building complex will be described with respect to the following:

- Physical Environmental Media Influence.
- Geographical Area of influence.
- Community influence and vulnerable persons in the institutions and
- Institutional Influence

5.1.1 Physical Environmental Media Influence

The proposed project's activities may have an impact on air quality, land (landscape), and surface and ground water. The proposed project site's landscape features include soil, flora, and fauna, and runoff water will be channeled to drains along the proposed site.

5.1.2 Geographical Area of Influence

The proposed project's immediate geographical area of influence is located at between Latitudes 4° 53' 28" to 4° 53' 38" N, and Longitudes 6° 53' 28" to 6° 55' 10" E. Because of traffic congestion during the project, the only area directly influenced by project activities is the East West road. Hostels along the project road, on the other hand, will have an indirect impact when construction vehicles break down, disrupting traffic, or construction ends up distorting service lines to those areas.

5.1.3 Community Influence and Vulnerable Persons

The proposed project's implementation could have an impact on the economic conditions of nearby communities. Construction projects provide opportunities for local food vendors to sell to construction workers in a secure environment.

Artisans and other construction workers will also be employed on a temporary basis as a result of the project. Vulnerable groups are those who are at risk of being disadvantaged and require special consideration in project design. Vulnerable individuals include, but are not limited to:

- Disabled members of the community.
- Children.

5.1.4 Institutional Influence

The major institutions to be influenced or involved in the proposed project include:

- University of Port Harcourt
- National Environmental Standards Regulatory Agency NESREA
- Federal Ministry of Environment
- Physical Planning/ Works and Services Department, University of Port Harcourt

5.2 Project Activities of Environmental and Social Concern

Activities of potential environmental and social impact identified with the proposed project are outlined under three (3) major phases of project activities: Pre-Construction, Construction, Operation, and Maintenance.

1. Pre-Construction phase impacts

During the pre-construction phase, the potential negative impacts are as follows;

- Land Preparation.

- Occupational Health & Safety and traffic/public Safety Issues

Key mitigation measures for these risks will be:

- Public and stakeholder consultation during site selection and preparation and validation of studies.
- Quality control and implementation of validation procedures for environmental studies and their dissemination.
- Regular supervision of the building sites by environmental experts.

These activities will be conducted largely by experts in the University's Physical Planning and Works and Services Department, University of Port Harcourt.

- Occupational Health and Safety Issues

- Public Safety Issues.

2. Construction phase impacts

Construction phase risks and impacts will be site specific and may cause inconvenience for workers and all those living or working on the University campus. The following are the most significant of these effects:

□ Negatives impacts

- Loss of vegetation and impacts on fauna.
- Effects on the local microclimate •
- Soil pollution, disturbance and erosion.
- Air quality deterioration.
- Vibration and noise nuisance.
- Generation and disposal of solid waste.
- Risk of pollution and deterioration of water quality

- Hygiene, health and safety of workers
- Risk of work accidents and occupational diseases
- Risk of spread of COVID19, respiratory and skin infections
- Public Safety issues
- risk of grievance and conflict

☐ **Positive impacts**

- Increased and improved economic activities around the project site
- Temporary employment opportunity, business opportunity

3. Occupation and Maintenance phase

During the occupancy and maintenance phase, ***PUTOR*** project activities should not pose any environmental or social problems. Potential negative impacts might generally be due to:

☐ **Negative impacts**

- Waste management and disposal
- Fire hazards
- Emission of bad odours
- Early degradation of the building due to misuse and lack of maintenance
- Public health and safety
- Occupational health and safety
- gender-based violence and sexual harassment
- Risk of spread of COVID19, respiratory and skin infections

- failure to take account of vulnerable people (disabled students, etc.) risk of grievance and conflict

□ **Positive impacts**

- Improvement of the aesthetics of the university site/ACE
- development of green spaces around the building
- Increased economic activity around the university/ACE
- Improved student comfort and study conditions
- employment opportunity, business opportunity
- Asset on the higher education system at national level
- Achievement of the ACE-Impact project objectives

5.3 Criteria for Impact Evaluation

The following criteria was used to assess the impacts:

- **The impact's duration:** this will consider whether the impact is temporary or permanent. Temporary effects must be reversible, lasting a few days, weeks, or months, whereas permanent effects are frequently irreversible.
- **The scope of the impact:** the scope should be regional, local, or site specific. When a large portion of a region's population is affected, the extent is regional. When it only affects a small portion of the study area, the extent is considered local. If the extent is felt in a small and well-defined space, it is site-specific.
- **The impact's intensity:** an impact's intensity is classified as strong when it is associated with a significant modification of the components. When an impact causes moderate disruption in the use of its components but is not irreversible, it is classified as

average. A component is also classified as low or weak intensity if it does not jeopardize some of its usage or characteristics.

- **Impact severity:** an impact can be severe, moderate, or minor. A significant impact is one that has far-reaching environmental consequences that cannot be easily mitigated. When an impact falls within the accepted legal limits and threshold, it is considered moderate. Because of the significant environmental impact, these consequences can be mitigated through specific mitigations. An impact is minor when its environmental impact is minor and can be mitigated with little or no effort.

5.4 Evaluation of Potential Impacts Associated with the Proposed Project

Evaluation of Potential Positive impacts

During the construction phase, the project will provide jobs for local food vendors and residents. Residents will be involved in various construction sections such as concrete work, excavations, Masonry work, finishing work, and so on, which will help provide employment for both skilled and unskilled youth in the area for the duration of the construction period.

This will go a long way toward diverting the attention of the youth who will be occupied away from other forms of social vices.

Machris Consults Nigeria Limited, which will serve as the primary consultant, will work in collaboration with the Physical Planning unit which is the University's physical development unit and will be equipped with all of the necessary logistics to carry out some activities during the planning and design stages which will bring good experience to the unit.

For the proposed building complex, the following benefits will contribute to the following:

- Improving access to of public health, toxicology, nutritional biochemistry and midwifery/child health nursing through the introduction of new educational programmes in this areas.

- Provide the right environment and facility to increase the number of students, particularly female and regional students graduating with master’s and PhD degrees, specifically being the first cohort of public health, toxicology, nutritional biochemistry and midwifery/child health nursing in West Africa.

Evaluation of Potential Adverse Impacts Associated with the Proposed project

The potential adverse impacts are evaluated with respect to the Pre-construction phase, Construction phase and the Operation and Maintenance phase.

Impacts are classified as Major, Moderate and Minor.

- **Major Impact:** An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued resource. The impact is very strong and cannot easily be reduced.
- **Moderate Impact:** an impact is described as moderate when it is within the accepted limits and standards. The impact on the environment is substantial but can be reduced through specific mitigation measures.
- **Minor Impact:** An impact is minor when the magnitude is sufficiently small and well within accepted standards and receptor is of low sensitivity. The impact on the environment is significant but subdued and may or may not require the application of mitigation measures.

5.4.1 Evaluation of potential Pre-construction phase Adverse Impacts

The identified impacts are evaluated in the table below.

Table 5.1: Potential impact associated with the pre-construction phase

No.	Impact	Key receptor(s)	Evaluation	Significance
1	Occupational health and safety, public issues	Workers, public	Setting out of construction site, hoarding of site, positioning of materials and equipment. These may pose injury to workers and the public. The use of standard safety practices will be implemented.	Moderate

2	Land preparation	University of Ghana	Weeding of site of entire of project site. This will lead to the clearing of some shrubs.	Moderate
---	------------------	---------------------	---	----------

5.4.2 Evaluation of potential Construction Phase Adverse Impacts

The identified impacts are evaluated in the table below.

Table 5.2: Potential impact associated with the construction phase

No.	Impact	Key receptor(s)	Evaluation	Significance
1	Loss of vegetation and loss of fauna	Fauna, soil	The construction of the proposed building project will require the clearance of vegetation for the footprint of the main layout. The vegetation to be lost are mainly grasses and shrubs. The vegetation is limited to the project site and of local extent and will therefore not result in the loss of any species of conservation and animal habitats.	Minimal
2	Effects on the local microclimate	Temperature	The construction of the proposed building project will require the clearance of some shrubs for the footprint of the main layout. The clearance will however be limited to the footprint of the main building and therefore will not affect	Minimal
			the temperature and precipitation in the area.	
3	Soil disturbance and erosion	Soil	Excavation works, clearing of the topsoil, levelling and other ground works will expose and loosen soil making it susceptible to erosion. The impact is temporary during the construction and can be properly managed through good construction.	Moderate

4	Risk of pollution and deterioration of water quality	Water Service line	Excavation works, clearing of the topsoil, levelling and other ground may expose water service lines to other adjoining properties when proper checks are not put in place	Moderate
5	Air quality deterioration	Construction and institutional workers, Ambient air environment and students	Loading, haulage and dumping of construction aggregates as well as cement handling will generate dust that can affect the air quality. Dust particles can be blown from the site through winds. Dust levels will be temporary, local in extent and average in intensity depending upon the weather conditions.	Moderate
6	Vibration and noise nuisance	Construction and institutional workers, Ambient air environment and students	The pumping of pre-mix concrete, operation of onsite concrete mixers, movement of delivery trucks, carpentry and welding works will generate noise and vibration. The impact from the construction related noise will be intermittent, temporary and of local extent. However due to the proximity of NMIMR and Tasty Treats Restaurant, delivery of construction materials such as sand, chippings and cement will be done after working hours to reduce the extent of noise through movements.	Moderate
7	Risk of work accidents and Occupational diseases	Construction workers and Artisans	The use of heavy construction equipment, excavation works, working at height may cause injuries to artisans when proper safety inductions are not done.	Major
8	Generation and disposal of solid waste	soil	Excavated materials are likely to form the bulk of waste to be produced from the construction activities. Removal of vegetation as well	Major

			as cement papers, food wrappers, used sachet water plastics and domestic refuse from food vendors who may be selling on the site will generate a lot of waste. This impact is local extent and temporary, lasting throughout the construction phase.	
9	Risk of spread of COVID19, respiratory and skin infections	Construction workers and Artisans	Interaction of workers on site through work activities may create the avenue for the spread of COVID19, respiratory and skin	Moderate
10	Traffic disruption and accidents	Public, Institutional workers	Movement of trucks on routes leading to the site may hinder traffic movement of persons and institutional vehicles.	Moderate
11	Occupational health and safety	Construction workers	Construction and excavation activities, movement of equipment, material handling and lifting, dust generation, open trenches pose a threat to workers and artisans on the project site. The extent of impact could be temporary or permanent.	Major
12	Public safety issues	Public, school	Movement of equipment and transportation of construction materials such as sand, stone, chippings, reinforcements, cement through the university may pose traffic safety concerns. Possible over speeding of construction vehicles and equipment is a major cause for concern due its potential cause of accidents.	Major
13	Risk of grievance and conflicts	Construction workers	Grievances and conflicts on sites may disrupt work activities that could ultimately lead to project delays.	Minimal

5.4.3 Evaluation of potential Operation and Maintenance Phase Adverse Impacts

The identified impacts are evaluated below.

Table 5.3: Potential impact associated with the operation and maintenance phase

No.	Impact	Key receptor(s)	Evaluation	Significance
1	Waste management disposal	Community	Disposal of soil and waste from the building. The extent of impact is continuous and local.	Moderate
2	Public health and safety	Public	Irregular maintenance of horticultural works and surrounding fauna which may lead to the breeding grounds for mosquitoes and other reptiles like snakes.	Moderate
3	Occupational health and safety	Workers	Internal and external cables that are not properly buried can lead to electrocution. Construction debris that are still on site after project has been completed.	Major
4	Fire hazards	Workers, Community	Poor cabling works and lack fire furniture i.e., smoke detectors, fire extinguishers.	Major
5	Emission of bad odours	Sanitary appliances, waste lines	Lack of proper ventilation of waste lines for W.Cs and installation of sanitary accessories such as bottle traps for basins leading to the emission of bad odours	Moderate
6	Early degradation of the building due to misuse and lack of maintenance	Building facility	Poor maintenance of building i.e., painting, replacement of damaged fittings etc. that will lead to fast deterioration of the building.	Major
7	Gender-based violence and sexual harassment	workers	Gender-based sexual advances at the workplace that are unconsent in nature.	Major
8	Failure to take account of vulnerable people (disabled students, etc.) risk of grievance and conflict	Building accessibility	Poor initial design to incorporate the account of vulnerable and disabled students	Major

6.0 ENVIRONMENTAL AND SOCIAL MITIGATION MANAGEMENT PLAN

6.1 Mitigation Plan

This section outlines an environmental management plan which will ensure good environmental practices throughout the various phases of the project. It discusses and allocates appropriate resources and responsibilities in mitigating the potential significant adverse impacts and issues relating to procedures for the management of unexpected change that will result by the implementation of the project.

Table 6.1: Proposed mitigations associated with Impacts

No.	Identified Impact	Project Activities	Proposed Mitigation Measures	Responsibility
Pre-Construction phase				
1	Occupational health and safety, public issues	<ul style="list-style-type: none"> • Setting out of works • Positioning of materials and equipment on site 	<ul style="list-style-type: none"> • Hoarding of the whole project site • Positioning of safety and warning signs around the project site 	Contractor
2	Land Preparation	<ul style="list-style-type: none"> • Site Clearing 	<ul style="list-style-type: none"> • Clearing of only weeds and leaving shrubs that are not affected by the main construction. 	PUTOR Secretariat
Construction phase				
2	Loss of vegetation and impact on fauna	<ul style="list-style-type: none"> • Site clearing • Excavation works 	<ul style="list-style-type: none"> • Vegetation clearance will be limited to only the area required for construction • Shrubs not affected by the construction will be left to form part of the building's horticultural layout. • Replacement of affected trees 	Contractor/ Consultant
3	Effects on the local microclimate	<ul style="list-style-type: none"> • Site Clearance 	<ul style="list-style-type: none"> • Vegetation clearance will be limited to only the area required for construction • Shrubs not affected by the construction will be left to form part of the building's horticultural layout. 	Contractor/ Consultant
4	Soil disturbance and erosion	<ul style="list-style-type: none"> • Site clearing • Excavation works • Waste generated disposal 	<ul style="list-style-type: none"> • Excavated materials and soil which cannot be used will be disposed of at approved sites. • Work on exposed trenches and earth materials will as much as possible be completed before new trenches are excavated. 	Contractor / Consultant

5	Risk of pollution and deterioration of water quality	<ul style="list-style-type: none"> • Site Clearance • Excavation works 	<ul style="list-style-type: none"> • Consultation with PPWSD to identify service lines before excavations commence. 	Contractor / Consultant
6	Air quality deterioration	<ul style="list-style-type: none"> • Site clearing • Excavation works • Concrete works • Transportation construction materials of	<ul style="list-style-type: none"> • Sand and cement loads in transit will be well covered to reduce dust levels rising above acceptable levels. • Stockpiles of exposed soil and unpaved access roads will be sprinkled with water to regulate dust levels. • Engines of vehicles, machinery and other equipment will be switched off when not in use. • Construction and civil works will be phased out or controlled to reduce emissions from equipment and machinery in use. 	Contractor / Consultant
7	Vibration and noise nuisance	<ul style="list-style-type: none"> • Site clearing • Excavation works • Transportation construction materials • Concrete works • Disposal of waste material of	<ul style="list-style-type: none"> • Earthwork and other construction activities will be phased out or controlled to reduce noise generation during construction. • Concrete mixer and other construction equipment will be located away from sensitive environmental receptors. • Engines of vehicles, equipment and machinery will be turned off when not in use. 	Contractor / Consultant
8	Risk of work accidents and Occupational diseases	<ul style="list-style-type: none"> • All construction activities 	<ul style="list-style-type: none"> • Conducting of Health and safety durbars to sensitize workers on risk of accidents and occupational diseases. • Use of caution signs and banksmen in the operation of earth moving equipment 	Contractor / Consultant

9	Generation and disposal of solid waste	<ul style="list-style-type: none"> • All construction activities 	<ul style="list-style-type: none"> • Excavated earth material will be re-used as much as possible to back fill if it meets the standard to reduce waste. 	Contractor/ Consultant
			<ul style="list-style-type: none"> • Excavated waste that is unsuitable for backfilling will be collected on site and disposed of at approved sites. • Provide bins on site for temporary storage of garbage such as empty drinking sachets and carrier bags. • All metal scrap waste will be disposed of at approved sites. • Contractor to prepare and abide by an agreed “Solid Waste Management Plan” throughout the construction period. 	
10	Risk of spread of STI-AIDS, COVID19, respiratory and skin infections	<ul style="list-style-type: none"> • All construction activities 	<ul style="list-style-type: none"> • Provision of wash points at the entrance of sites and at vantage site points, the use of nose masks on site to help in regulating the spread of COVID19. • Conducting of sex education meetings and enforcement of rules on site that prohibits any form of sexual encounters. 	Contractor/ Consultant
11	Traffic disruption and accidents	<ul style="list-style-type: none"> • Transportation of construction equipment and materials. • Use of equipment on site. 	<ul style="list-style-type: none"> • Regulation of speed for construction equipment on site and transportation trucks to site. • Positioning of speed signs on site and site entrances. 	Contractor/ Consultant

12	Occupational health and safety issues	<ul style="list-style-type: none"> • All construction activities 	<ul style="list-style-type: none"> • Engage experienced artisans for construction work. • All workers should be given proper induction/ orientation on safety. • The contractors / engineering consultant to develop a Health and Safety Policy and procedures to guide the construction activities. • Regularly service all equipment and machinery to ensure they are in good working condition. • Ensure there are first aid kits on site and a trained person to administer first aid. 	Contractor / Consultant
			<ul style="list-style-type: none"> • Provide and enforce the use of appropriate personal protective equipment (PPE) such as safety boots, reflective jackets, hard hats, nose masks, ear plugs etc. • Comply with all site rules and regulations. 	
13	Public Safety Issues	<ul style="list-style-type: none"> • All construction activities 	<ul style="list-style-type: none"> • Hoard off the construction sites to prevent access to unauthorized persons. • Warning signs and notices will be placed at all dangerous locations, e.g., open trenches • Speed limit for all vehicles and construction equipment should be less than 20km/h within the construction space. • Ensure delivery trucks are in good condition to prevent breakdown on the campus roads. • Provide adequate signage to warn motorists of ongoing activities on roads along the construction site. 	Contractor/ Consultant

14	Risk of grievance and conflicts	<ul style="list-style-type: none"> • Construction workers • Design and cost variation 	<ul style="list-style-type: none"> • Insist on a grievance mechanism to be used on site by the contractor. • Stated form of arbitration in the contract document to address any form of grievances. 	Contractor/ Consultant
----	---------------------------------	---	---	------------------------

No.	Identified Impact	Project Activities	Proposed Mitigation Measures	Responsibility
Operation and Maintenance phase				
15	Waste Management and disposal	<ul style="list-style-type: none"> • Disposal of soil and waste materials from the building. • Disposal of refuse from the building. 	<ul style="list-style-type: none"> • Have in place a periodic disposal management system for waste and refuse. 	PUTOR Facilities management team.
16	Public health and safety impacts	<ul style="list-style-type: none"> • External works 	<ul style="list-style-type: none"> • Ensure the period maintenance of landscaping. • Fumigation of shrubs and fauna to prevent the presence of snakes and mosquitoes. 	PUTOR Facilities management team

17	Occupational health and Safety	<ul style="list-style-type: none"> • Cleaning of facility. • Layout of cables in office and classroom spaces. • Access to emergency openings. • Laboratory activities 	<ul style="list-style-type: none"> • Placing of notifications for wet floors during cleaning of facilities. • Proper arrangement of cables to prevent trips during movement. • Provide adequate signages throughout the building. • Proper use of PPEs in Laboratories and organization of periodic Health and safety trainings to create awareness. 	PUTOR Facilities management team
18	Fire hazards	<ul style="list-style-type: none"> • Use of Laboratory equipment 	<ul style="list-style-type: none"> • Installation of smoke detectors • Installation of fire extinguishers on vantage points on each floor and specific spaces like the laboratories 	PUTOR Facilities management team
19	Emission of bad odours	<ul style="list-style-type: none"> • Usage of sanitary fittings 	<ul style="list-style-type: none"> • Daily disposal of bins in the building to the central refuse system of the project. 	PUTOR Facilities management team
		<ul style="list-style-type: none"> • Disposal of refuse from the building 	<ul style="list-style-type: none"> • Daily cleaning and disinfection of washrooms. 	
20	Early degradation of the building due to misuse and lack of maintenance	<ul style="list-style-type: none"> • Daily usage of building • Precipitation on building walls. 	<ul style="list-style-type: none"> • Preparation of maintenance schedules to prevent the degradation of the building. 	PUTOR Facilities management team

21	Gender-based violence and sexual harassment	<ul style="list-style-type: none">• Daily work activities	<ul style="list-style-type: none">• Enforcement of the PUTOR sexual harassment policy against any offender.• Education of employees on sexual harassment	PUTOR Senior Management
22	Failure to take account of vulnerable people (disabled students, etc.) risk of grievance and conflict	<ul style="list-style-type: none">• Project Design	<ul style="list-style-type: none">• Ensure disability friendly access to the building and other facilities during the design stage of the building	Consultant/ PUTOR

6.2 Environmental and Social Monitoring Plan

The environmental and social monitoring plan proposed for the implementation of the ESMP for the *PUTOR* Building project is outlined in Table 6 below.

Table 6.2: Proposed Environmental and Social Monitoring Plan

No.	Environmental component	Monitoring Parameters	Monitoring Site	Frequency	Responsibility
Pre-Construction phase					
1	Occupational health and safety, public issues	<ul style="list-style-type: none">• Evidence of hoarding and warning signs on the construction site.	Construction site	Monthly	Contractor / consultant
Construction phase					
2	Loss of vegetation	<ul style="list-style-type: none">• Presence of vegetation within the project site.	Construction site	Monthly	Contractor / consultant

3	Effects on the local microclimate	<ul style="list-style-type: none"> • Presence of trees not in the layout of the project left untouched 	Construction site	Daily	Contractor / consultant
4	Soil disturbance and erosion	<ul style="list-style-type: none"> • Evidence of gullies from rushing water after rains. 	Construction site	Weekly	Contractor / consultant
5	Air quality	<ul style="list-style-type: none"> • Observation of dust and exhaust fumes 	<ul style="list-style-type: none"> • Construction site • Immediate environment 	Daily	Contractor / consultant
6	Vibration and noise	<ul style="list-style-type: none"> • Complaints on noise from adjoining institutions. 	<ul style="list-style-type: none"> • Construction site • Immediate environment 	Daily	Contractor / consultant
7	Waste Management	<ul style="list-style-type: none"> • Availability and use of bins • Records on frequency and location of waste disposal site of domestic and construction waste 	<ul style="list-style-type: none"> • Construction site 	Daily	Contractor / consultant
8	Risk of pollution and deterioration of water quality	<ul style="list-style-type: none"> • Presence of a clearly demarcated area with notes on the average depths of existing water service lines 	<ul style="list-style-type: none"> • Construction site 	Monthly	Contractor / consultant
9	Occupational health and safety	<ul style="list-style-type: none"> • Availability and proper use of PPE's • Adherence to health and safety procedures • Records on frequency, type, and source of illness/accident/injury • Records on non-compliances 	<ul style="list-style-type: none"> • Construction site 	Daily	Contractor / consultant

10	Risk of work accidents and Occupational diseases	<ul style="list-style-type: none"> • Availability of road signs clearly indicating speed limits for construction equipment and trucks. • Availability and Presence of a banksman during excavations and tipping of materials such as chippings, sand etc. on site. 	• Construction site, Road leading to the project site	Daily	Contractor / consultant
11	Risk of spread of COVID19, respiratory and skin infections	<ul style="list-style-type: none"> • Wearing of nose masks on site • Availability of a running water system and wash hand bowls or basins at the entrance of the site. • A site durbar on the avoidance of any sexual activity on site. 	• Construction site	Daily	Contractor / consultant
12	Public safety and traffic issues	<ul style="list-style-type: none"> • Hoarding of project site • Records on frequency, type and source of accident / injury 	• Construction site	Daily	Contractor / consultant
13	Risk of grievance and conflicts	• Presence of mode of arbitration and dispute resolution in the contract document	• Preparation of tender stage	Once	Consultant
Operation and Maintenance phase					
14	Waste generation and disposal	• Record of Planned disposal management system	• Building project	Daily, monthly	PUTOR Facilities Management team
15	Public health and safety impacts	• Availability of signage's to guide unauthorized entry and safety.	• Building space	Daily	PUTOR Facilities Management team

16	Occupational health and safety	<ul style="list-style-type: none"> • Availability and proper use of PPE's during maintenance and cleaning works • Adherence to health and safety procedures • Records on frequency, type, and source of illness/accident/injury • Records on non-compliances 	• Building space	Daily	PUTOR Facilities Management team
17	Fire hazards	<ul style="list-style-type: none"> • Availability of working fire extinguishers at designated spaces. • Availability of smoke detectors in all spaces. 	• Building Space	Daily, Monthly	PUTOR Facilities Management team
18	Emission of bad odours	<ul style="list-style-type: none"> • Daily disposal of bins • Daily cleaning of washrooms 	• Building Space	Daily	PUTOR Facilities Management team
19	Early degradation of the building due to misuse and lack of maintenance	• Records of Maintenance schedules for all fittings and fixtures	• Building Space	Monthly, quarterly	PUTOR Facilities Management team
20	Gender-based violence and sexual harassment	• Availability of PUTOR's sexual harassment policy	• Building space / working environment	Daily	PUTOR Administration team, Safeguards Officer

21	Failure to take account of vulnerable people (disabled students, etc.) risk of grievance and conflict	<ul style="list-style-type: none"> • The Presence of environmentally friendly access for the disabled students. • Availability of PUTOR's grievance and conflict resolution mechanism / procedure 	• Building space / working environment	Monthly	Consultant, PUTOR Administration team, Safeguards Officer
----	---	---	--	---------	---

7.0 ENVIRONMENTAL MANAGEMENT STRUCTURE

This section presents the Environmental and Social Management Plan developed for all project to provide the guidelines and procedures for managing the significant impacts of the proposed PUTOR building project.

The overall goal of the Environmental and Social Management Plan is to progressively reduce the adverse impact of the project activity on the environment with the ultimate aim of eliminating them. The significant positive impacts on the other hand, will be enhanced to ensure sustainable development.

Additional challenging targets have been set for the project and they include:

- The integration of environmental management issues into the project plan.
- Development of a waste management programme for the project.
- Promoting the environmental management awareness among workers.
- Encouraging the contractor to develop an environmental management guideline for the project.

The proposed project activities shall have minimal impacts on the biophysical environment, health and safety of its employees and, members of the public, and socio economic well-being of the local residents; thus, focus should be on reducing the negative impacts and maximizing the positive impacts associated with the project this activity through a program of continuous management, monitoring and improvement.

7.1 Environmental Social Management Plan Objective

The University of Port Harcourt (UPH) is determined to ensure that the PUTOR building project is constructed with conscious effort to minimize any adverse impact on the environment.

This shall be accomplished by;

- a) Ensuring strict adherence to and compliance with stipulated legislation on environmental protection.
- b) Integrating environment into the project plan, development and operational philosophies.
- c) Ensuring compliance with mitigation measures in ESMP Plan.
- d) Providing standards for overall planning, operation, audit and review.
- e) Ensuring the application only of environmentally sound procedures during the life span of the project.
- f) Promoting the environmental management awareness among workers.

7.2 Use of the Environmental Social Management Plan

The Environmental Social Management Plan is and shall remain a dynamic management tool. Periodic review and update of ESMP shall be carried out throughout the project's life span so as to incorporate new and better environmental technologies, regulations, management systems, guidelines and policies.

For a successful implementation of the ESMP, it is necessary to have a structure that will assign roles and responsibilities at every stage of the monitoring process. A report on the monitoring programme will provide the contractor and PUTOR with relevant data and information to better understand the extent of implementation of the ESMP. All monthly progress reports will capture health, safety and environmental issues arising from the implementation of the ESMP.

PUTOR will engage a qualified contractor through a process of Tendering in accordance with the University of Port Harcourt tender as approved in the implementation of the construction phase activities of the building project. To achieve the environmental management goals for the project, among other objectives, PUTOR will constitute a Project Implementation Team (PIT) to be chaired by the Director of Physical Planning Department University of Port Harcourt. The Project Manager who is directly in charge of the PUTOR building Project is a member of the building committee and reports directly to the Director of PUTOR. The ESMP will be part of the tender documents to serve as a guide to contractors in the discharge of their responsibilities and contract terms. The PIT will coordinate and oversee site construction activities and ensure the monitoring and implementation of the environmental policies of the project. The occupancy and maintenance phase will be managed by PUTOR's internal facilities management team.

The ESMP is in line with the guidelines provided in the Environmental Social Framework of the World Bank as well as the Environmental policies in the Federal Government of Nigeria.

7.3 Project Implementation Team (Pit)

The Project Implementation Team (PIT), on Environmental, Health and Safety issues will be headed by the Environmental and Social Safeguards Officer for PUTOR. He will facilitate the ecological sustainability aspect of the project. The project implementation team will be responsible for all environmental issues at the construction phase of the project, and will comprise the project manager, the project coordinator, the PUTOR Safeguards Officer and the procurement specialist.

Management of environmental issues at the occupancy and maintenance phase will be incorporated into the Environmental and Social Management Plan.

The PIT will also be responsible for assessing, managing, and monitoring environmental and social risks and impacts associated with each stage of the project. This will include:

- Identification, evaluation, and management of social risks impacts of the PUTOR building project.
- Adopt a mitigation hierarchy approach to anticipate and avoid risk impacts and where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels.

7.3.1 Functions of the Project Implementation Team (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 – FMEV, Nigerian 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 the environmental policies of the project.
- Undertaking environmental and social monitoring activities for the project.

- Monitoring of all environmental policies during pre-construction and construction phases of the project, including those related to bio-physical and socioeconomic/cultural components.
- Working closely with construction workers 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.
- Coordinating investigations on all types of accidents.
- Conducting environmental audits in accordance with project monitoring guidelines.
- Preparation of relevant environmental reports covering the project.

7.4 General Health and Safety Procedures

The guidelines provided in the Section 47 of the Factory Act in line with the National Policy on Occupational Safety and Health developed in 2006, shall be strictly complied to at the Construction, Operation and Maintenance phases of the project. These regulations cover the major safety areas.

7.5 Grievance Redress Process

To establish a channel to resolve grievances, it is necessary to put together a Grievance redress mechanism (GRM). A GRM is basically the institutions, instruments, methods, and processes by which a resolution to a grievance is established and provided. The consultations of project affected persons and other key stakeholders will ensure that their concerns during project implementation and would help reduce the rate of conflicts. Avenues have been created for project affected persons to express a grievance related to the proposed construction activities.

7.5.1 Objective and Purpose of Grievance Redress Mechanism

The objective of the GRM is to provide a procedure which will be used to address and resolve grievance or complaints from affected persons promptly, and fairly in a manner that is acceptable to all parties. It is intended to provide an alternative form of dispute resolution to avoid or minimize litigation.

7.5.2 Potential Grievances/Disputes

Potential issues of grievances and disputes envisaged during the project implementation are expected to be related to the following:

- Disruption of traffic flow along the East West road
- Noise generation
- Dust dispersal
- Poor housekeeping at project site
- Improper behavior by artisans towards members within the university environment.

7.5.3 Redress Mechanism

The general steps of grievance process comprise:

- Registration of complaints.
- Determining and implementing the redress action.
Verifying the redress action.
- Monitoring and Evaluation.

7.5.3.1 Registration of Complaints

Complaints can be logged verbally or in writing or phone call to the PUTOR project coordinator at the secretariat on the University of Port Harcourt Campus. The elected consultant for the project i.e., Physical Planning department can also receive complaints. The PUTOR Project Coordinator will inform the team leader for the grievance redress committee within 24 hours on any complaint lodged.

7.5.3.2 Determining and Implementing the Redress Action

When a grievance/dispute is recorded as per above-mentioned registration procedures, the dedicated redress team will be called into action, and mediation meetings will be organized with the interested parties. Minutes of meetings will be recorded. The grievance issue will be resolved within 5 working days of receipt of complaints.

7.5.3.3 Verifying the Redress Action

The grievance redress team will visit the affected property or get in touch with the complainant to confirm that the redress action is carried out. If the complaint is not satisfied with the outcome of the redress action, additional steps will be taken to reach an amicable agreement. Verification will be completed within 5 days of the execution of the redress action.

7.5.3.4 Monitoring and Evaluation

The monitoring and evaluation team will monitor the activities of the Grievance Redress Team to ensure that complaints and grievances lodged are followed-up and resolved amicably as much as possible.

7.6 Membership of Grievance Redress Team/Committee

The membership of the grievances and redress team/committee shall be constituted by the director of PUTOR and it shall cut across all participatory team heads in the project.

7.7 Functions of the Grievance Redress Team/Committee

- Resolving of grievances, disputes, complaints, and conflicts from project affected persons.
- Aid the Safeguards Officer in the smooth implementation of the ESMP.
- Ensure that concerns of affected stakeholders and suggestions are incorporated and implemented during the construction phase.

8.0 DISCLOSURE OF ESMP

The World Bank (WB) requires that the ESMP is submitted for public disclosure purposes. The disclosure will take the form of in-country as well as disclosure at the infoshop of the World Bank.

8.1 In-Country Disclosure Process

The PUTOR study team spearheaded by the Safeguards Officer will submit copies of the ESMP to the World Bank for clearance. After clearance from the world bank, the ESMP will be made available to the University Library website, other public places and the Physical Planning/Works and Services Department of the University of Port Harcourt as part of the tender documents for contractors to bid in tendering process which will be published in a national newspaper.

8.2 Info-shop

Copies of the final ESMP will be submitted in electronic form to the World Bank and the document will be disclosed at the Infoshop of the Bank.

9.0 CONCLUSION

The project implementation shall be committed to ensuring sustainable environmental management and safeguarding the health and safety of the construction workers and the public during the implementation of the proposed project. The project implementation team is aware of the national building regulation of Nigeria, and will ensure that the project follows the

guidelines and requirements. This ESMP has identified and assessed key environmental and social impacts and concerns that may arise from the implementation of the proposed project.

Consultations, field inspections and studies helped in the identification of the project's adverse environmental and social impacts. A monitoring programme to help detect changes arising from the predicted adverse impacts has also been presented in this ESMP. The recommendations outlined in the ESMP for the project will ensure a high level of health, safety, and environmental management for the proposed project.

PUTOR is a seed of Public Health and Toxicological research in Africa and is committed to producing talented professionals, toxicologists and Child Nurses to improve access to Public Health experts and reduce toxicological challenges in Africa for all. The proposed project will provide an infrastructure for numerous benefits to education and research into public health with the purpose of addressing a major development challenge in relation to public health challenges in Africa.

10.0 REFERENCES

1. World Bank Environment and Social Policies, August 2016.
2. AAU Environmental and Social Management Framework (ESMF), Revised version 28 November 2018
3. West African Genetic Medicine Centre (WAGMC), University of Ghana Implementation plan, April 2019.
4. World Bank Climate Change Knowledge Portal, accessed 9:15am, October 13, 2021.

11.0 ANNEXES

Annex 1 Participant List for Stakeholder Consultations

NAME	INSTITUTION	POSITION
Prof Daprim Ogaji	PUTOR	Centre Leader
Dr. Anthonet Ezejiofor	PUTOR	Safe Guard Officer
Dr. Faith Diorgu	PUTOR	Liaison Officer
Engr. Nicholas Abule	Works /PUTOR	Procurement Officer
Mr. Francis Okocha	PUTOR	Auditor
Dr. Chukwu Okeah, Gift.O	National Open University of Nigeria	Environmental Consultant
Dr. Kingsley Patrick - Anyanwu	PUTOR	Monitoring/Evaluation Officer
Mr. Uchenna Otamiri	PUTOR	Technical Officer

Annex 2: Composition of the Study Team

Dr. Chukwu-Okeah, Gift.O Environmental Consultant

Mr. Martin Anusim Site Supervision/ Safety Officer

Engr. Nicholas Abule, (Project Procurement Officer) Works and Services Department

Arch. Chris Emekoma Project Consultant

Annex 3: Minutes of Stakeholder Consultation Meeting

Minutes of Stakeholder Engagement Meeting

Location: Proposed Project Site

Date: 17th November, 2021

In Attendance:

NAME	INSTITUTION	POSITION
Prof Daprim Ogaji	PUTOR	Centre Leader
Dr. Anthonet Ezejiofor	PUTOR	Safe Guard Officer
Dr. Faith Diorgu	PUTOR	Liaison Officer
Engr. Nicholas Abule	Works /PUTOR	Procurement Officer
Mr. Francis Okocha	PUTOR	Auditor
Dr. Chukwu Okeah, Gift.O	National Open University of Nigeria	Environmental Consultant
Dr. Kingsley Patrick-Anyanwu	PUTOR	Monitoring/Evaluation Officer
Mr. Uchenna Otamiri	PUTOR	Technical Officer

1.0 Opening

The meeting started at 9:21 am and was chaired by Director, ACE PUTOR. The Environmental Consultant and the Environmental and Social Safeguards Officer kick started the meeting after the director introduced the reason for the gathering.

2.1 Meeting Brief

The Environmental Consultant explained the agenda and the need for stakeholder engagements before the commencement of projects. All stakeholders briefly introduced themselves after which the Environmental and Social Safeguards Officer detailed out the nature of the project and the type of building to be constructed on the site. Layouts of the building was given out to all stake holders. One of the Stakeholders raised the concern over the closeness of Scavengers to the project site, the Director responded that before the completion of the project the Physical Planning Department of the University was to move them out of the area as the area still falls within the University of Port Harcourt Property.

2.2 Site Inspection

The Assistant director of the centre led the whole team for an inspection of the site with the focus being,

- To clearly ascertain if the location was adequate and proper for the project
- To ascertain if there are any structures within the boundaries of the site.
- And to get the concerns of stake holders.

2.3 Stakeholder Concerns and proposed Mitigations

Another concern raised in the course of the meeting was the need for another entrance into the project site through the IPS hostel and adjoining forest. It was established that University of Port Harcourt was already embarking on making the provision of the alternative route.

3.0 Other Matters

- The Environmental Consultant expressed his gratitude to all stakeholders for honoring the invitation to have the meeting and also thanked the PUTOR administration for following standard rules involving stakeholders before the commencement of the project.

4.0 Closing

In the absence of other matters, the meeting ended at 10:09am, after which group photographs were taken.

Mr. Uchenna Otamiri
Prepared By



Signature

Date

Engr. Nicholas Abule
Confirmed By
(Stakeholder Rep)



Signature

Date

Prof. Daprim Ogaji
Approved By
(ACE PUTOR Centre Leader)




Signature

Date


**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)
FOR THE CONSTRUCTION OF THE ACE PUTOR BUILDING COMPLEX**

Prepared by


Dr. Chukwu Okeah, Gift Ogondah
Environmental Consultant
(ACE PUTOR, BUILDING PROJECT)


Dr. Anthonet Ezejiofor
Environmental and Social Safeguards Officer

20th January 2022
Date


Prof. Daprim Ogaji
Centre Leader
Africa Centre of Excellence in Public Health and Toxicological Research (ACE PUTOR)

20th January 2022
Date


Arch. Micheal Ubom
Director
Physical Planning Department University of Port Harcourt

20th January 2022
Date

ACCEPTED AND APPROVED ON BEHALF OF
AFRICA CENTRE OF EXCELLENCE IN PUBLIC HEALTH AND TOXICOLOGICAL
RESEARCH (ACE PUTOR)
UNIVERSITY OF PORT HARCOURT

January, 2022