



**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)
FOR THE CONSTRUCTION OF AFRICA CENTRE OF EXCELLENCE
ON NEW PEDAGOGIES IN ENGINEERING EDUCATION(ACENPEE),
AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA**

FINAL REPORT



FEBRUARY, 2023

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LIST OF ACRONYMS AND THEIR DEFINITIONS

ABU	Ahmadu Bello University
ACE	African Centre for Excellence
ACENPEE	The Africa Centre of Excellence on New Pedagogies in Engineering Education
B	Bottom
CO	Carbon Monoxide
CBOs	Community Based Organizations
CSOs	Civil Society Organizations
EMP	Environmental Management Plan
ESIAs	Environmental and Social Impact Assessments
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FAC	First Aid Cases
FMEnv	Federal Ministry of Environment
FGDs	Focus Group Discussions
FRSC	Federal Road Safety Corps
GPS	Global Positioning System
H ₂ S	Hydrogen Sulphide
IEC	Independent Environmental Consultant
IUCN	International Union for Conservation of Nature and Natural Resources
LGA	Local Government Area
LTI	Lost Time Injuries
MDAs	Ministries, Departments and Agencies
NESREA	National Environmental Standards and Regulations Enforcement Agency
ND	Not Detected
NGOs	Non-Governmental Organizations
NO ₂	Nitrogen Dioxide
OHS	Occupational Health and Safety
OP	Operational Policy
PAPs	Project Affected Persons
PDO	Project Development Objective
PIC	Prior Informed Consent
PIU	Project Implementation Unit
PLWDs	People Living with Disabilities
PPE	Personal Protective Equipment
PP&MS	Physical Planning and Municipal Services
SPM	Suspended Particulate Matter
T	Top
TPV	Third Party Validation
WB	World Bank

EXECUTIVE SUMMARY

ES1 Introduction

The Africa Higher Education Centres of Excellence (ACE) Project is a World Bank initiative in collaboration with governments of participating countries to support Higher Education institutions in specializing in Science, Technology, Engineering and Mathematics (STEM), Environment, Agriculture, applied Social Science / Education and Health. It is the first World Bank project aimed at the capacity building of higher education institutions in Africa.

The first phase (ACE I) was launched in 2014 with 22 Centres of Excellence in nine (9) West and Central African countries. The Project aims to promote regional specialization among participating universities in areas that address specific common regional development challenges. It also aims to strengthen the capacities of these universities to deliver high quality training and applied research as well as meet the demand for skills required for Africa's development. The second phase (ACE II) was launched in East and Southern Africa with 24 Centres. Based on the initial successes, the World Bank and the French Development Agency (AFD) in collaboration with the African governments launched the ACE Impact Project in 2018 to strengthen post-graduate training and applied research in existing fields and support new fields that are essential for Africa's economic growth. There are 53 ACEs.

One of the centres in Nigeria, The Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE) is a centre of excellence to fill the gap that exists in the training of engineering professionals where there is over reliance on traditional teaching methods which hardly produce well-skilled engineers.

The centre plans to implement modern, engaging, student-Centred pedagogies that include Cooperative, Hands-on, Active, Problem-based Learning (CHAPL) that are capable of producing high quality engineers.

The Centre is proposing to construct its office complex. The proposed building project has been assessed to have potential adverse impacts that are site specific, and for effective management, monitoring and reporting of project related risks, ACENPEE, will develop and implement an Environmental and Social Management System during the lifecycle of the project.

ES2 ESMP Objectives

The overall objective of the ESMP is to ensure project compliance with applicable national environmental and social legal requirements and the World Bank's environmental and social safeguards. Further, the ESMP aims to identify environmental and socio-economic benefits of the project as well as identifying potential adverse environmental and socio-economic impacts.

The ESMP document also describes measures to prevent, minimize, mitigate and or compensate for identified potential environmental and social impacts within the framework of Environmental, Occupational Health & Safety (OHS) and Community Health and Safety (Corporate Social Responsibility - CSR). It provides a logical framework within which identified negative environmental and socio-economic impacts can be mitigated and monitored. In addition, it

assigns responsibilities of actions to various actors and provides a time-frame within which the mitigation measures and monitoring can be carried out.

ES3 Project Description

The location for the proposed ACENPEE building is within the Ahmadu Bello University Zaria Campus. The construction of the ACENPEE building will involve mobilization of equipment, materials and civil works. This ESMP is prepared to identify and address the adverse impacts associated with this proposed civil works under sub-component 1.2 of the overall ACE program development objectives

ES4 Legal and Institutional Framework

This project is being guided by various applicable policies, regulations and guidelines on conducting ESMP studies stipulated by relevant authorities. These include Federal Ministry of Environment, State Ministry of Environment, as well as the World Bank Safeguard Policies being 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, and OP 4.11 Cultural Physical Resources which provides cultural heritage guidelines to avoid or mitigate adverse impacts of development projects. 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 have been integrated including the operational policies of the World Bank.

ES5 Environmental and Social Baseline

For the purpose of baseline data acquisition, an integrated and interdisciplinary team of professionals and practitioners were engaged. The various areas covered in course of this study are: Air quality, Soil, Water Quality (Surface and Ground water), Noise, Meteorology, Vegetation and Socio-economics.

ES6 Summary of Impacts and its Environmental and Social Management Plan.

A summary of the identified impacts, mitigation, monitoring and institutional measures to be taken to avoid or minimize adverse environmental and social impacts during project phase from preconstruction through construction to implementation and operation is highlighted hereunder.

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.

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.

adherence to mitigation measures proffered with regular supervision of the building sites by environmental experts.

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.
- Public Safety issues
- risk of grievance and conflict

Positives impacts

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

Operation & Maintenance phase

During the occupancy and maintenance phase, ACENPEE 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
- Failure to take account of vulnerable people (disabled students, etc.) risk of grievance and conflict

Positive impacts

- Asset on the higher education system at national level
- 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

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 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 is 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.

ES7 Estimated cost of the ESMP Implementation

The cost of implementing the environmental and social management plan is expected to be Six million four hundred and seventy thousand two hundred Naira(~~N~~**8,320,400**) only with details outlined in Table 6.6.

CHAPTER ONE: INTRODUCTION

1.1 Background

The Africa Higher Education Centres of Excellence (ACE) Project is a World Bank initiative in collaboration with governments of participating countries to support Higher Education institutions in specializing in Science, Technology, Engineering and Mathematics (STEM), Environment, Agriculture, applied Social Science / Education and Health. It is the first World Bank project aimed at the capacity building of higher education institutions in Africa. The first phase (ACE I) was launched in 2014 with 22 Centres of Excellence in nine (9) West and Central African countries; Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, Ghana, Nigeria, Senegal and Togo.

The Project aims to promote regional specialization among participating universities in areas that address specific common regional development challenges. It also aims to strengthen the capacities of these universities to deliver high quality training and applied research as well as meet the demand for skills required for Africa's development. The second phase (ACE II) was launched in East and Southern Africa with 24 Centres across Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda and Zambia.

Based on the initial successes, the World Bank and the French Development Agency (AFD) in collaboration with the African governments launched the ACE Impact Project in 2018 to strengthen post-graduate training and applied research in existing fields and support new fields that are essential for Africa's economic growth. There are 53 ACEs; 5 Emerging Centres; 1 “top up” Centre in Social Risk Management; and 5 Colleges and Schools of Engineering. The new areas include sustainable cities; sustainable power and energy; social sciences and education; transport; population health and policy; herbal medicine development and regulatory sciences; public health; applied informatics and communication; and pastoral production.

The **Project Development Objective** of the ACE II Project is to improve the quality, quantity and development impact of postgraduate education in selected universities through regional specialization and collaboration.

In Nigeria, The Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE) at Ahmadu Bello University, Zaria was selected as part of the new ACE Impact Centres. ACENPEE is a centre of excellence to fill the gap that exists in the training of engineering professionals where there is over reliance on traditional teaching methods which hardly produce well-skilled engineers, thus the mandate of the Centre is to improve the quality of postgraduate training in the African sub-region through enhancement of curriculum review and development, development of new teaching methodologies so as to produce high-quality professionals that can impact higher order skills, entrepreneurial spirit, and research capacity within the engineering disciplines and technology. The Centre aims at sharpening the pedagogical knowledge and skills of students in curriculum and course design, learning theories in engineering, use of multimedia technology and practical micro teaching. The knowledge and skills in new pedagogies is expected to supplement the traditional lecture method in educating the engineers of the present and future.

The centre plans to implement modern, engaging, student-Centred pedagogies that include Cooperative, Hands-on, Active, Problem-based Learning (CHAPL) that are capable of producing high quality engineers.

1.2 Rationale for ESMP

Part of the projects of the Centre is the construction of a new building to house the ACENPEE-ACE Centre. This will have significant environmental and social impacts on the immediate surrounding (Ahmadu Bello University main campus). Therefore, to ensure all impacts are identified and mitigation measures as well as responsibilities for implementing these measures are in place, an Environmental and Social Management Plan (ESMP) is required. The ESMP will also include recommendations on good work practices considering the COVID-19 situation which, requires physical/social distancing, good hygiene practices and consultations where required. It will ensure that the ACENPEE-ACE project is in compliance with the World Bank Safeguard Policies particularly OP 4.01 Environmental Assessment and OP 4.11 Physical Cultural Resources both triggered for the ACE II Project.

The ESMP will also ensure the project complies with the Nigeria EIA Act CAP. E12 L.F.N. 2004. The ESMP will be utilized by the contractor(s) to be commissioned by ACE Impact Centre (ACENPEE) in the preparation of the required Contractor's ESMP (C-ESMP). which will form the basis of the site-specific management plan prior to works commencing.

The ESMP will be used by the contractor to address all Occupational Health and Safety (OHS) issues and community health and safety issues associated with the proposed construction work.

1.3. ESMP Objectives

The ESMP will achieve the following objectives:

- i. Provide a detailed description of the main phases of the works (preparation, execution/construction, operation) and key activities of the works to be executed;
- ii. Conduct public consultations with all the stakeholders of the Project in order to collect their suggestions that will be integrated in the ESMP;
- iii. Carry out an analysis of the initial environmental status of the sites concerned and describe the biophysical, socio-economic and cultural characteristics of the environment in which the sub-project activities will take place,
- iv. Highlight the major constraints that need to be taken into account at the time of site preparation, construction and during the construction and installation of equipment and during the operation phase;
- v. Identify the environmental and social components that may be impacted by the implementation of the works
- vi. Check to ensure that the design and construction methods and the various components of the works are consistent with the ecological, social, economic and cultural realities of the project areas and, if necessary, propose any necessary readjustments;
- vii. Analyse the legal and regulatory framework for environmental management in relation to national legislation and World Bank safeguard policies;
- viii. Identify and analyse, by implementation phase, the potential social and environmental impacts, both positive and negative (including impacts on physical cultural resources)

that may result from the realisation of the rehabilitation, renovation or construction works of the infrastructures

- ix. Assess the significance of these impacts during the project phases, compared to the no-project scenario;
- x. Propose measures to optimise the positive impacts during the different phases of the works and technically viable and economically feasible mitigation measures to avoid, minimise, mitigate or compensate for the negative environmental and social impacts so as to bring them to acceptable levels; on the environment and the human environment;
- xi. Present the costs of implementing the proposed mitigation measures;
- xii. Assess the need for solid and liquid waste collection, disposal and infrastructure management, and make recommendations;
- xiii. Propose a mechanism for managing complaints that may arise in the course of the works.
- xiv. Potentially screen out environmentally unsound activities
- xv. Propose modified designs to reduce environmental and social impacts
- xvi. Identify feasible alternatives
- xvii. Predict significant adverse impacts
- xviii. Identify mitigation measures to reduce, offset, or eliminate adverse impacts
- xix. Engage and inform potentially affected communities and individuals
- xx. Influence decision-making and the development of terms and conditions

1.4 World Bank policies triggered

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.

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 classed 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 ACENPEE-ACE 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 ACENPEE-ACE project. i.e. *OP 4.01 Environmental Assessment* and *OP 4.11 Cultural Physical Resources*. A summary of the World Bank Policies triggered for the project are presented in annex 4.

1.5 Approach and Methodology for ESMP

The approach and methodology adopted for this ESMP included, Bibliographic research / literature review, Site inspection, Data collection, Stakeholder Consultation and Reporting in line with the Nigeria Environmental Impact Assessment Act (EIA Act) procedures, ACE Environmental and Social Management Framework (ESMF) and the World Bank Operational Safeguards Policies.

Site assessment studies, Data Collection and Stakeholder Consultation were undertaken between 21st -24th February 2023 to:

- Identify the baseline conditions of the project area
- Identify environmental and social receptors which may be impacted by the proposed works, through observation, consultations with relevant stakeholders and survey
- Hold consultations with various stakeholders identified
- Conduct Biophysical analysis of air, water and soil by sampling
- Conduct socio-economic survey through administration of structured questionnaires in the project environ (annex 15)
- Identify potential impacts along with appropriate enhancement or mitigation measures for positive and negative impacts respectively
- Develop relevant Environmental & Social -Management Strategies and Implementation Plans (ES-MSIPs) as contained in the annexes

Tools and Methods Used

- **Field assessments** were conducted through observation, consultations with relevant stakeholders and survey.
- Air quality sampling was conducted using *Aeroqual (series 500)* complete kit which had cartridges of PM_{2.5}, PM₁₀, CO, CO₂, CH₄, NO, NH₃, H₂S, SO₂ and VOCs for gaseous air pollutants. The *GARMIN (etrex 20x)* GPS was used in taking coordinates reading while the *LT (SP-8001)* was used for Air velocity, relative humidity and temperature. The *SEW (2310SL)* was used to measure noise level at all the sampled points. A *Control* point coordinates was taken within the College of Medicine which is 40m away from the sampling point at the proposed project site.
- **Water samples** were collected from the tap available for use in the boy's hostel beside the project area. The water supply is from the university treatment plant and sent to accredited environmental laboratory-integrated chemical laboratory and consultancy, Kano immediately for analysis of physico-chemical and microbiology parameters.
- **Composite soil samples** were collected with a soil auger and sent to accredited environmental laboratory-integrated chemical laboratory and consultancy, Kano for analysis of physico-chemical and microbiology parameters.
- **Socio-economic questionnaire** was designed and used to obtain information on the socio-economic survey in the project area
- **Potential Impacts identification** was done using predefined impact checklists and Leopold matrix.

1.6 Applicable International, Federal, and State Laws and Regulations

The national and state level legal framework relevant to the project is presented in the Table 1.1 below.

Table 1.1: National and State level legal framework relevant for the Assignment

Regulatory Framework	Description	Project Compliance
National Policy on the Environment, 1989. Revised 2016	The policy identifies key sectors requiring integration of environmental concerns and sustainability with development and presents their specific guidelines	ACENPEE will abide by the provisions and processes of the National Environmental Policy which ensures environmental protection and sustainability of projects
Environmental Impact Assessment (EIA) Act CAP E12 LFN 2004	The Environmental Impact Assessment (EIA) Act CAP E12 LFN 2004 provides guidelines for activities of development projects for which EIA is mandatory in Nigeria. According to the act, category II projects such as the ACENPEE requires only a partial EIA/EMP, which will focus on mitigation and Environmental planning measures,	An ESMF was prepared for ACE to provide a framework to address environmental and social concerns under the project in compliance with the World Bank's OP 4.01 Environmental Assessment. This ESMP has been prepared in compliance with the World Bank's Operational Policies and the Nigerian EIA law, as a site-specific management and mitigation plan to address potential negative impacts.
National Environmental (Sanitation and Wastes Control) Regulations (2009)	The purpose of the Regulation is the adoption of sustainable and environment friendly practices in environmental sanitation and waste management to minimize pollution. The Instrument amongst others makes provisions for the control of solid wastes and hazardous wastes.	A waste management plan including categories of the project waste, management plan including costs and responsibilities is included in the ESMP.
National Environmental (Soil Erosion & Flood Control)	The purpose of these Regulations is to establish technically feasible and economically reasonable standards and procedures to achieve appropriate level of management and conservation	Measures to avoid/minimize such practices are contained in the ESMP including reclamation of borrow pits and recommendation for

Regulatory Framework	Description	Project Compliance
Regulations (S.I. 12) 2011	practices to abate soil erosion, siltation and sedimentation of the waters of Nigeria, due to soil erosion and flood aggravated by non-agricultural earth-disturbing activities.	proper termination of drainage & culverts in the engineering designs.
National Environmental (Air Quality Control) Regulations, 2014	Includes recommended measures to prevent, minimize, and control air emissions from combustion processes fuelled by gaseous, liquid and solid fossil fuels designed to deliver electrical or mechanical power, steam, heat, or any combination of these, regardless of the fuel type, and stipulates limits for various parameters	Measures to avoid/minimize such impacts are contained in the ESMP including all vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES), use fuel efficiency techniques, catalytic converters etc. on machinery
National Environmental (Noise Standards and Control) Regulations, 2009	The objective of the Regulations is to ensure maintenance of a healthy environment for all people in Nigeria, the tranquillity of their surroundings and their psychological wellbeing by regulating noise levels. The Instrument prescribes maximum permissible noise levels for construction as 60dB (A) and 40dB(A) for day and night respectively	Measures to avoid/minimize noise pollution are contained in the ESMP including retrofitting of heavy equipment, provision of ear plugs to workers and limiting of project activities to work hours to avoid disturbing rest periods
National Environmental (Construction Sector) Regulations (S.I No. 19), 2011	The purpose of these regulations is to prevent and minimize pollution from construction, decommissioning and demolition activities in the Nigerian environment. It stipulates that new project in the construction sector shall apply cost-effective, up-to-date, efficient, best available technology, to minimize pollution to the barest degree practicable. In addition, every operator or facility shall carry out an EIA and submit an EMP for new projects or modification including expansion of existing ones before commencement of activity.	The preparation of this ESMP is in compliance to this National regulation. Furthermore, pollution risks have been identified and mitigation measures duly factored
National Policy on Occupational	This policy was approved by the Federal Executive Council (FEC) in	An OHS Plan has been provided in the ESMP. In

Regulatory Framework	Description	Project Compliance
Safety and Health, revised 2020	September 2020. It provides a guide for voluntary compliance and serves as a basis for occupational health and safety programs for workers even under such development projects	In addition, the contractor will submit an HSE plan to the PIU as part of contract documents.
Workers Compensation Act (2010)	The Workmen’s Compensation Act makes provisions for the payment of compensation to workmen for injuries suffered in the course of their employment	The PIU will ensure that labour management is in line with the requirements of this law. As will be monitored by the environmental & safeguards officer
Kaduna State Environmental Protection Law	Facilitate protection, restoration, conservation, development and management of the environment and natural resources for equitable, sustainable socio-economic development.	The Kaduna State Environmental Protection Agency (KASEPA) will have oversight function for waste management and periodic monitoring of environmental parameters as stated in the ESMP monitoring table.
The Violence Against Persons Prohibition (VAPP) ACT (2015)	This act prohibits all forms of violence against private and public life and provides maximum protection and effective remedies for victims and punishment of offenders. Nigeria’s national government has taken steps to penalize and address GBV and SEA.	ACENPEE already has a zero tolerance for sexual harassment and has in place the ACENPEE Sexual Harassment (SH) Policy to conform with this requirement
National Gender Policy (2006)	Provides a framework for ensuring gender inclusion and sensitivity in developmental plans and programs at the national and sub-national levels.	ACENPEE through the environmental and safeguard officer will ensure that there is gender consideration in every phase of the project
National Inclusive Education Policy (2001)	This national policy provides that education must be inclusive for all children including those with disabilities. Children with disabilities have the right to qualitative, functional and effective basic education. The policy ensures that systems and strategies are modified to provide a barrier free environment for all learners with disabilities.	RAMPs are provided in the project design to allow for access for PWD.

Regulatory Framework	Description	Project Compliance
Sexual Harassment (SH) Policy	The policy is dedicated to enlightening its public on the evils of sexual harassment and other associated anti - social conduct Sexual harassment has very grave effects on the overall productivity of staff and students in the university	The ACENPEE project will adopt this policy in prevention of SEA/SH/GBV on the project
Policy for Students with Special Needs	The policy is awaiting its final stage before it becomes effective as a working document of the ABU MAIN CAMPUS.	The ACENPEE project will adopt this policy in ensuring inclusion, as is demonstrated in the provision of access ramps for PLWDs in the project design

1.7 Applicable World Bank Operational Safeguards Policies

Two of the World Bank Operational Safeguards Policies are triggered under this Project as described in table 1.2 below

Table 1.2: Applicable ESS and Applicability to the ACENPEE Construction Project

Triggered Policy	Reason for Application of Standard to the Project	How it will be addressed by the project
OP/BP4.01 Environmental Assessment	Proposed construction works will result in environmental and social impacts attributed to generation of waste, noise/air pollution, movement of heavy-duty vehicles & traffic issues, occupational health & safety risks, risks associated with labour influx, community health & safety risks amongst others. However, these impacts are limited, site specific and can be mitigated.	This ESMP contains measures to address the identified risks and includes other specific plans such as waste management plan, OHS plan, community health & safety plan amongst others.
OP/BP4.11 Cultural Physical Resources	During the excavation and earthworks, contractors may encounter physical and cultural resources such as artefacts, tombstones, historical/cultural landmarks	A Physical and Cultural Resources Management Plan that includes the chance find procedure has been included in annex 13----- of this ESMP

It is a requisite by the World Bank that Investments which it finances comply with the host country's national standards as well as other relevant International environmental and social policies. In addition to Nigerian legislations, the Project should address World Bank operational policy regarding environmental and social issues as it covers the requirements of many of the financing institutions.

When the host country's regulations differ from the levels and measures presented in the World Bank operation policies, projects will be required to achieve whichever is more stringent. This also applies if there are differences between Federal and State standards, the stricter standard must be followed.

1.8 Structure of the Report

In line with the Terms of Reference (ToR), the ESMP report will include the following Chapters and Sections:

Preliminary pages

Chapter 1: Introduction

Chapter 2: Project Description

Chapter 3: Biophysical and Socio-Economic Characteristics of Project Area

Chapter 4: Assessment of Potential Adverse Environmental and Social Impacts.

Chapter 5: Consultation with Stakeholders

Chapter 6: Environmental and Social Management Plan (ESMP)

Chapter 7: Summary and Recommendations

Annexes

CHAPTER TWO: PROJECT DESCRIPTION

The ACENPEE-ACE Centre is located at ABU University, Zaria, Nigeria. The mandate of the ACENPEE-ACE Centre is to improve the quality of postgraduate training in the African sub-region through enhancement of curriculum review and development, development of new teaching methodologies so as to produce high-quality professionals that can impact higher order skills, entrepreneurial spirit, and research capacity within the engineering disciplines and technology. To accommodate the cutting-edge research of the Centre at sharpening the pedagogical knowledge and skills of students in curriculum and course design, learning theories in engineering, use of multimedia technology and practical micro teaching, there is need to construct the ACENPEE- ACE building complex. The project study location is indicated in Figure 2.1



Figure 2.1: Project Study location in ABU Zaria.

2.1 Project Site Setting

The proposed project site was allocated by the University Authority, following a transparent consultation and stakeholders' engagements. All necessary documentations for the allocation of this land have been concluded.

ACENPEE followed the due diligence in engagement of all relevant key stakeholders during the selection of the site with due consideration to feasible project design in order to avoid any encumbrances. At the project location, the site for the construction covers a land area of approximately 3500 square meters. The site is selected for ease of intervening opportunities to avoid impacts on biodiversity in accordance with the WB OP/BP and minimal displacement. The current encumbrances of the Boys hostel had been sorted out with the necessary notification and provision of alternatives for the occupants of the hostel to be managed diligently by the Director, Physical Planning and Municipal Services (PP&MS) university. Annex 14 shows the concluded plan on the relocation of the students to a more suitable hostel.

2.2 Description of the Proposed Intervention Works

The ACENPEE-ACE project will involve activities associated with constructing a building complex which will be a functional unit consisting of two floors – a ground floor and first floor. The construction will be implemented on land belonging to Ahmadu Bello University Zaria, hence, it is expected that there will be minimal to no involuntary resettlement, acquisition of land, relocation, compensation, loss of physical and economic assets, and/or loss of livelihoods. Summary of activities to be undertaken during each of the project phases consisting of pre- construction phase, construction, operational and decommissioned phase is outlined in Table 2.1.

Table 2.1: Project Phases of intervention works

Project Phases	Activities
<p>Preconstruction Phase Activities</p>	<p>Preconstruction phase activities include among others:</p> <ul style="list-style-type: none"> • Land survey, building design & review with reference to regulatory organization recommendations, • Planning for storm water drainage and containment, • Assessment of existing project location, selection of beneficiary • institutions, field studies and environmental screening; • Preparation of environmental and social screening reports & ESMP; • Undertaking site preparation, • Procurement of items and transporting the required components and construction equipment to site, • Statutory permitting activities from Kaduna State/Zaria Local Government Authorities/ PP&MS • Establishing staging area and site office • Mobilization of workforce • Removal of trees and vegetation.

<p>Construction/ Demobilization Phase Activities</p>	<p>Construction phase activities include among others:</p> <ul style="list-style-type: none"> • Mobilization of equipment, materials and personnel to site • Earthworks • Excavation of trenches and drainage • Groundworks • Setting out, • Establishment of construction area, and other onsite structures and ancillary infrastructure • Identification of storage area for construction material; • Transportation and handling of materials and equipment; • Installation of traffic & safety signage and cautions on site • Construction of waste bin bays where applicable • Civil & Construction Works on sub-structure and superstructure; • Carpentry, roofing, plumbing & electrical activities, fittings, cladding/coating and landscaping • Demobilisation from site <ul style="list-style-type: none"> ✓ Removal of construction equipment ✓ Disposal of construction waste & other waste ✓ Dismantling of staging area temporary work camp of the contractor
<p>Operations and Maintenance Phase Activities</p>	<p>Operations and maintenance phase activities include:</p> <ul style="list-style-type: none"> • Procure equipment for the Pedagogies Laboratories; • Install equipment needed in the Administrative Offices; • Procure and install wired/wireless facilities; • Procure teaching equipment <i>and</i> • Procure and install inverters systems for the ACENPEE project • use of the facility for provision of services such as technological trainings, skill acquisition, offices, library, coffee room, rest rooms and Laboratory for analysis • Housekeeping; • Waste management (collection and disposal); • Maintenance and repair works; and • Materials management and storage (including personal protective equipment, etc.).

2.2.1. Project Design

Specifically, the ACENPEE project have obtained a beautiful architectural design with the best of modern facilities that meets international standards. The design proposal consists of the teaching section- 2 class rooms (50-seater each with modern teaching facilities), 2 meeting rooms for 20 persons each (with modern facilities) and the Research section respectively,

connected by the administrative wing at the Centre. On the upper floor of the building are accommodated the offices of the Centre Leader, Assistant Centre Leader, Administrative Secretary. The upper floor houses the offices for the various categories of researchers as well as a conference room. The research wing has the Laboratories- Techno - pedagogy laboratory and ICT/Computer laboratory on the ground floor. There are ample provisions for parking lots for staff and visitors with Beautiful landscaping. The form of the building is such that it can grow and expand to accommodate future needs without Constraints. Ref. Figures 2.2, 2.3, 2.4.



Figure 2.2: Ground floor plan of proposed building



Figure 2.3: First floor Plan of proposed building

2.2.2 Design Consideration

Vulnerability Consideration: The design incorporated ramps into and within the building, leading to all levels from the ground level (see Figures 2.1 & 2.2 above). Generally, the layout is designed to reduce point-to-point movement time, which is favourable to People Living with Disabilities (PLWDs) who may experience physical stress and exhaustion from longer travel time between operation points. Furthermore, the floors are designed in levels, which reduces the point-to-point movement time compared to conventional floor designs. Additionally, the design provides special toilets for PLWDs with larger toilet spaces, lower wash-hand basin, marked floor tiles for visually impaired, adequate lightening on stairs, bigger doors, supporting rails, and other supporting accessories for ease of use for PLWDs.

Drainage and Waste Management: The design proposes both surface and underground drainage systems that will terminate into the existing drainage layout of the ABU Master Plan and will eventually be terminated into the central sewage system of the city. It is noteworthy that the existing ABU premises has drainage systems which the drainages to be provided for the ACENPEE Centre will be linked to. The drainage design and direction leverage on the natural gradient of the proposed construction site, with a gentle slope NW of the site. Generally, waste management is the responsibility of the waste management arm of the PP&MS of ABU. The school initially has a central sewage system designed to for all sewage lines. Designated central waste collection point where waste is collected on weekly bases by the ABU Municipal

Services Unit of PP&MS. However, waste collection bins will be provided within the Centre for collecting wastes.

Design for Fire management and response: The design proposes installation of fire extinguishers at specific and easily accessible positions of the building, installation of smoke detectors, and sprinkler system.

Drilling of Borehole: The source of water for the Centre is proposed to be primarily from a borehole which will be drilled for the Centre within the proposed site. The geophysical survey for drilling the boreholes for the nearby postgraduate hostels and Biochemistry Department reported that the depth is approximately 50m depth. Hence, the depth of drill for the proposed borehole for the ACENPEE Centre may be about 50m - 70m, but for a good and sustainable result a geophysical survey is recommended before any drilling. Additionally, the design proposes accessories for water supply into the Centre including an overhead water storage tank and reticulation.

Source of Electricity: The Centre proposed primary source of electricity is to link to the National grid (PHCN) and diesel-powered generator. The Centre is envisaged to have significantly high energy demand and consumption rate due to the functionalities of the proposed Centre with Laboratory Services. This necessitates the need for a stable and hybrid energy source for the Centre. However, a Solar Power System is planned for the Centre to achieve adequate power need of the Centre.

Security Considerations

The centre design has incorporated security dimension for safety of all personnel into the design from the approach to the centre for ease of accessibility. The building design incorporates barricades to prevent access by vehicles into the building. Security personnel will also be deployed within and outside the building for surveillance and crime prevention. In addition, Closed Circuit Television (CCTV) cameras will be installed in and outside the building.

2.3. Project Schedule

The development of this project is expected to cover a period of Six months. This will include pre-construction (site clearing, procurement of equipment, transport of materials to site) and construction (concrete work, bricks masonry, plumbing, electrical works, roofing and landscaping). To achieve this, ACENPEE will require a Project Manager (PM) and site supervisor/foreman. Table 2.2 shows the Gantt chart with project schedule from April 2023, while proposed overall design for the ACENPEE building is in Figure 2.4.

Table 2.2 Gantt chart showing Project Schedule

PROJECT SCHEDULE		APRIL – OCTOBER, 2023					
S/N	ACTIVITY/ MONTH	1	2	3	4	5	6
1	Mobilization to Site /Site Clearing	x					
2	Transportation of materials and equipment to site	x					

3	Construction of temporary site office, Setting out, excavation and substructure (building of foundation trench)		X	X		
4	Construction of superstructure			X	X	X
5	Finishing				X	X
6	Commissioning, Operation/maintenance					X

Source: Consultant Work Schedule, 2023



Figure 2.4: Approach Perspective of Proposed ACENPEE Building

CHAPTER THREE: DESCRIPTION OF THE ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

This section of the report puts together the baseline environmental and social 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 various areas covered in course of this study are: Air quality, Soil, Water Quality (Surface and Ground water), Noise, Meteorology, Vegetation and Socio-economics.

Data collection for this ESMP study commenced with a formal focused discussion with key stakeholders of the proposed project afterwards was the actual sampling which took place on 21st of February, 2023. An environmental and social baseline study was carried around the proposed project site as shown in Figure 3.1 to establish a benchmark of existing environmental and social 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. The main coordinates of the project site and sampling points are indicated in Table 3.1.

Table 3.1: Project site Boundaries and sampling points Coordinates

Site	Soil Sample	Water Sample	Air Quality Coordinates Points		
Coordinates Points	Coordinates Points	Coordinates Points	Latitude	Longitude	
11.1525049,7.6484095	11.1526,7.64865	11.15282, 7.6486	11 ⁰ 09.177'N	007 ⁰ 38.935'E	N.E
11.1526884,7.6481356	11.1530545, 7.6484843		11 ⁰ 09.160'N	007 ⁰ 38.920'E	E
11.1529792,7.648252	11.1529631, 7.6489212		11 ⁰ 09.149'N	007 ⁰ 38.902'E	S.E
11.153042,7.6486439			11 ⁰ 09.190'N	007 ⁰ 38.925'E	N
11.1527006,7.648717			11 ⁰ 09.173'N	007 ⁰ 38.910'E	C
			11 ⁰ 09.163'N	007 ⁰ 38.896'E	S
			11 ⁰ 09.204'N	007 ⁰ 38.915'E	N.W
			11 ⁰ 09.191'N	007 ⁰ 38.908'E	W
			11 ⁰ 09.184'N	007 ⁰ 38.901'E	S.W
			11 ⁰ 09.183'N	007 ⁰ 38.931'E	NE-N
			11 ⁰ 09.174'N	007 ⁰ 38.896'E	S-SW
			11 ⁰ 09.230'N	007 ⁰ 38.940'E	

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.



Figure 3.1: Sampling Locations in and around the Proposed Project Site.

3.1 Climate /Meteorology

The thirty-year meteorological data (1991 – 2021) of the proposed project area (NIMET, 2023) indicate that its climate is tropical with two distinct dry and rainy seasons. These are respectively characterized by the hot and wet conditions associated with the movement of the Inter-Tropical Convergence Zone (ITCZ) north and south of the equator. The ITCZ appears as a band of clouds, usually thunderstorms, circling the globe near the equator and Nigeria is located just north of the equator. When it is to the south of the equator, the north-east winds prevail producing the dry season and when in the northern Hemisphere, the south-westerly wind prevails bringing rainfall and the rainy season. The measured microclimatic parameters in the proposed project site is shown in Table 3.2.

Table 3.2: Measured Microclimatic Parameters in the Proposed Project Site

Level	Air Temperature (°C)	Relative Humidity (%)	Atmospheric Pressure	Wind	
				Speed (m/s)	Direction
Minimum	33.7	9.8	704	0.5	NE
Maximum	38.5	15	707	2.1	N
Mean	36.1	12.4	705.5	1.3	N

3.2. Rainfall and Relative Humidity

The proposed project area witnesses significant rainfall. Zaria typically receives about 89.92 millimetres (3.54 inches) of precipitation and has 128.23 rainy days (35.13% of the time)

annually from February to October September. Trend of rainfall in the project area depicts depreciation from 1991 to 2021 with trend line equation of $y = -12.691x + 1413.8$ with regression of $R^2 = 0.1013$. Average Annual Rainfall distribution from 1991 to 2021 is shown in Figure 3.2.

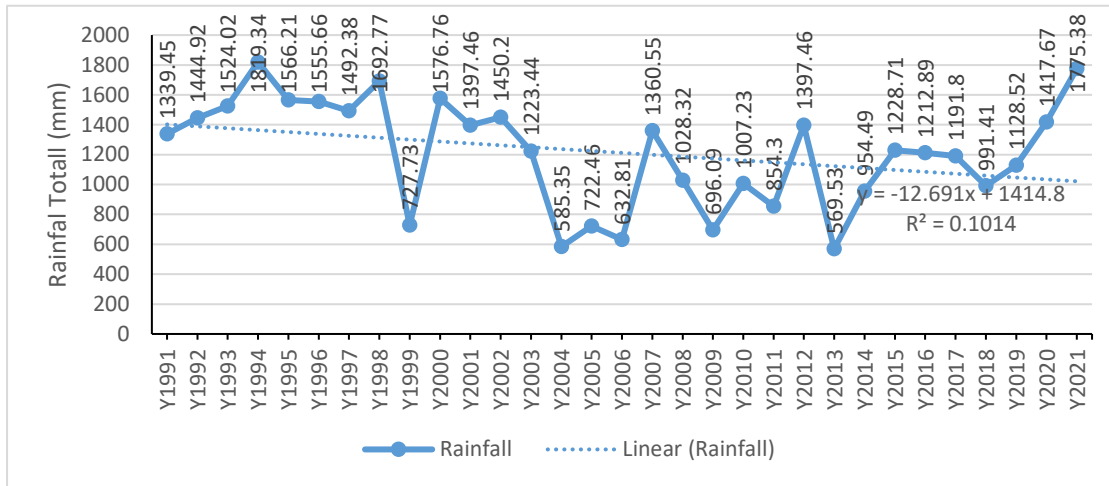


Figure 3.2: Average Annual Rainfall distribution from 1991 to 2021 (NIMET, 2022)

3.3. Air Temperature

Relative humidity is high in the state throughout the year and decreases slightly in the dry season. Figures 3.2 and 3.3 clearly depicts a positive trend in minimum ($y = 0.0554x + 7.838$ and $R^2 = 0.1424$) and positive maximum temperature ($y = 0.0823x + 37.667$ $R^2 = 0.2763$) which is a clear indication of climate change in the area. Minimum Temperature of Zaria from 1991 to 2021 is shown in Figure 3.3.

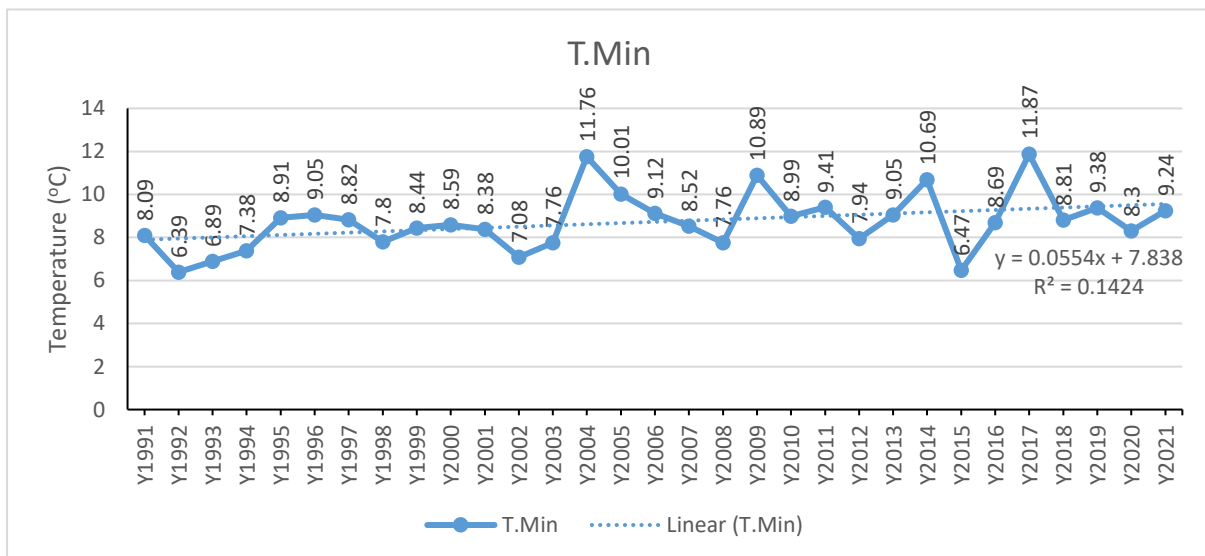


Figure 3.3: Minimum Temperature of Zaria from 1991 to 2021 (NIMET, 2022)

Temperature in the proposed project area is with an average high-temperature of 38.6°C (101.5°F) and an average low-temperature of 23.6°C (74.5°F), April is the warmest month in Zaria, with maximum of 38.5°C which agrees with the measured air temperature of 33.7 – 38.5

°C obtained during the fieldwork (See table3.2). Air temperature is attributed to the latitudinal location of the region within the tropics with the highest in November/January (peak of the dry season) and the lowest in July/August (peak of the wet season).

3.4 Sunshine Pattern

In the proposed project area, mean monthly sunshine period is 2 - 12 hours per day with the minimum between July and September and the maximum in November. The short sunshine period in July is associated with the greater cloudiness and rainfall characteristic of the period. Conversely, the higher November rate is due to the prevalent clear skies when the ITCZ has once more started its Northward migration. The sunshine duration reflects the double maxima feature of the rainfall pattern. Monthly sunshine period in the proposed area is shown in Figure 3.4.



Figure 3.4: Monthly Sunshine Period in the Proposed Area (weather-atlas.com, 2022)

3.5 Air Quality

Presented in Table 3.3 are the measured gaseous pollutants from the area during this study. Though nine gaseous pollutants were monitored, and all were detected at various ranges. None of the detected gaseous pollutants however breached its 1-hour standard during the study. Plate 3.1 show a typical sampling set up in the project area.

Table 3.3: Measured gaseous pollutants in the project area

Sampling Codes	Concentrations (ppm)								
	*CO	*NO	NO ₂	*VOC _s	O ₃	CH ₄	NH ₃	H ₂ S	SO ₂
AQ1	3.31	0.075	0.086	0.03	0.106	0	0.2	1.61	0.00
AQ2	3.02	0.081	0.091	0.01	0.106	2	0.3	1.06	0.04
AQ3	3.11	0.081	0.091	0.01	0.103	0	0.2	1.61	0.00
AQ4	3.28	0.083	0.092	0.02	0.111	0	0.0	0.04	0.00
AQ5	3.51	0.079	0.089	0.00	0.100	0	0.4	0.69	0.00
AQ6	3.31	0.080	0.090	0.00	0.102	1	0.2	0.09	0.00
AQ7	3.75	0.078	0.088	0.03	0.105	0	0.1	0.02	0.00
AQ8	3.15	0.079	0.089	0.01	0.101	0	0.0	0.00	0.00
AQ9	3.28	0.076	0.087	0.00	0.104	0	0.1	0.43	0.00

AQ10	3.31	0.079	0.089	0.02	0.110	0	0.2	0.07	0.00
AQ11	3.23	0.082	0.091	0.00	0.104	0	0.1	1.78	0.01
Control	3.05	0.080	0.087	0.00	0.098	0	0.0	0.00	0.00
Mean	3.30	0.080	0.089	0.01	0.105	0.27	0.16	0.67	0.005
Standard Deviation	±0.19	±0.00 2	±0.00 4	±0.01	±0.0 03	±0.6 2	±0.12	±0.69	±0.01 2
Standards	10-20	0.01- 0.04	0.04- 0.06	0.05	0.01- 0.1	1.2 – 2.4	25 – 35	500 – 1000	0.02- 0.04

3.6 Ambient Noise Levels

Ambient noise levels in the proposed project area obtained during the study are 23.4 – 49.8 dB(A), 30.8 – 56.5 and 32.2 – 58.3 dB(A) as minimum, maximum and background levels. The background noise levels did not breach the 90 dB(A) FMEnv 8-hour and the 55 dB(A) NESREA Residential/Commercial limits in any of the sampling locations. However, these breached the 50 dB(A) NESREA Residential/Office area limit in two locations. At the proposed project site vehicles and electric power generators powering BTS were the major source of noise observed during the study.

The result of the noise level survey is presented in Table 3.4 of this report.

Table 3.4: Noise level survey

Sampling Location	Noise Level, dB(A)		
	Minimum (L _{min})	Maximum (L _{max})	Background (L ₉₀)
AQ1	45.7	47.2	NA
AQ2	32.1	33.5	NA
AQ3	32.5	34.2	NA
AQ4	33.1	34.5	NA
AQ5	56.2	57.9	NA
AQ6	32.6	34.2	NA
AQ7	30.8	32.2	NA
AQ8	31.7	33.2	NA
AQ9	56.5	58.3	NA
AQ10	31.9	33.3	NA
AQ11	31.4	32.9	NA
Control	33.5	34.8	NA
FMEnv 8-Hr Limit			90
NESREA	Residential/Commercial		55
	Residential/Office		50



Plate 3.5a-d: Typical Sampling Setups during the Study in ABU, Zaria

3.7 Water Studies

Potable source of water was sampled within the area of influence from the tap available for use in the boy's hostel beside the project area. The water supply is from the university treatment plant. The water sampling area is shown in Plate 3.2.

The physico-chemical properties of the water sample are presented in Annex 1 of this report.



Plate 3.6: Water sampling within the study area

3.8 Soil Studies

The soils in the study area mainly fall within the Basement Complex. Basement complex rocks are the oldest rocks in Nigeria and they are made up of granites, quartzites, schists, and gneisses (Iloeje, 2004). Plate 3.3 show the soil sampling collections points. All the soils were deep to moderately shallow and were well-drained. It will permit crop root proliferation and elongation. The colour of the soil matrix showed slight variation having a yellowish brown (10YR S /4) to brown (7.SYR 4/3) in the surface horizons with mostly strong brown (7.SYR 4/6) coloration in the subsoils. Soil samples collected within the study area were analysed. The analytical results are presented in Annex 1.



Plate 3.7: Soil sampling within the study area

3.9 Vegetation

The vegetation of the study area particularly the area designated for the construction mostly consists of landscaped area with ornamental Plant Species such as Bougainvillea, Caesalpinia pulcher-rima, Ixora coccinea, Ashoka trees, and sections of patchwork of fallow regrowth which are at various stages of development. Also within the area of influence are also matrices of trees. Flora species identified in the study area include: economic trees, shrubs and grasses. The principal grasses in the area are mostly high grasses such as Pennisetum sp. Economic trees include: mango tree. The vegetation of the project location is shown below in Plate 3.4. None of the vegetation of economic trees will be affected by construction or operation phase. They have been studied within the area of influence because of future expansion as may be required, thus resettlement or compensation issues are not triggered under this project.



Plate 3.8: Display of Vegetation at the project location

3.10 Fauna

The information of important terrestrial animal groups such as birds, (pigeons, kingfishers), reptiles-lizard and mammals such as bats, rats were observed within the project area in the impact zone.

3.11 Land Use of the Project Site

The project area is in an academic institution (Ahmadu Bello University, Main Campus Samuru, and Zaria). Land use outside the project site/ campus is fallow land for agricultural use. Common crops cultivated include sugar cane, maize, millet, guinea corn and vegetables. Subsistence fruit crops like mango, cashew, and pawpaw were spotted around existing farmlands.

3.12 Socio-Economic Environment

3.12.1 Population

The population of the study area is inhabited by students, lecturers, staff, business men and women found within the Campus and its environs in Samaru- Zaria. The total student enrolment in the university's degree and sub-degree programme is about 50,000, drawn from every state of Nigeria, Africa, and the rest of world. There are about 3,000 academic and research staff

and 6,000 support staff. The metro area population of Zaria in 2021 was estimated at 736,000, a 1.38% increase from 2020. The area population in 2020 was 726,000, a 9.7% increase from 2019.

3.12.2 Socio-economic Characteristics and Health Condition

The project area is sited in an academic community with a common socio-cultural characteristic. The community is universal in nature some practise Christianity, some Islam and some Traditional religious beliefs and some Atheist. The major socio-economic activities are academic related with business centres to service the academic institution.



Plate 3.5: Questionnaire Administration to Centre staff & Students

Source: Field Survey, February 21st, 2023.

3.12.3 Socio-Economics Data Collection

The methods of data collection adopted for this study includes observation with recording of observable physical features in the community, use of questionnaire within the project community and Focal group discussions in addition to secondary data where applicable. Socio economic characteristics of respondent in the community is outlined in Table 3.5.

Table 3.5: Respondents Socio-Economic Characteristics

S/N	Socio-Economic Indices	Socio-Economic Findings
1	Gender	There are more male than female in the population. Male respondents account for about 60% while the female gender represents 40% of the total sampled population.
2	Age	As indicated, there is the possibility of higher youth population (active age group) in the project area as the respondents in the age group of 18 to 45 years (57.13%) account for the highest proportion in the sampled population. This is followed by age group of 46 to 65 years (28.57%) while those that are above age 65 years' account for 14.3%. The age group distribution indicated by the respondents is expected of a university environment.

3	Marital Status	Married respondents account for 71.43% while single and widowed/separated jointly represent 28.57%. It could therefore be envisaged that a great number of the people in the school, who are incidentally mainly staff of the ABU are married and have sense of commitment. Married people are presumed to be more responsible.
4	Ethnic group	Indicated ethnic group by the respondents are the Hausas and Fulani (42.85%), Igala, Ebira (14.31%) while the Yorubas, and other tribes which account for 14.28% each. The indicated ethnic groups by the respondents may not necessary represent the real composition of the school staff. However, a federal establishment such as ABU Zaria is expected to have a predominance from the Northern group.
5	Religion	As indicated, those that claimed to be Muslim are 66.9% while Christians account for 33.1%. The respondent's religious inclination reflects the prominent religions been practice on Campus. This is due to the location of the University. It should there be noted that the study community does not discriminate or denied anyone from practicing his/her religion belief.
6	Occupation	Civil servants (government workers) and Traders/Business owners are the dominant livelihoods indicated by the sampled population. This is not also unexpected due to the circumstance that surrounds the school and indeed all public Universities in Nigeria when the study was carried out. Consequently, occupations indicated respondents are civil service (82.8%) and trading/business (17.2%). Other businesses such as farming, motorcycle (Kekenapep and mini-van), artisans, point of sale (POS) operators, mobile phone repairers etc are also found within the campus.
7	Education	Respondents dominant education attainments are University graduate (42.86%) and University postgraduate (28.57%). Others such as OND/NCE/HND and secondary school account for 14.28% each. As expected of a university community, it could therefore be noted that there is a high level of literacy people within the study area.
8	Size of Household and relationship	The dominant average household(HH) size indicated by the sampled population are 3 to5 people (53.2%), 1 to 2 people (33%), while household member greater than 5 people are 13.8%. The common household size in the study area corresponds to an average HH size of 5/6 people in Nigeria as published by the National Bureau of statistics(NBS) and Central Bank of Nigeria(CBN) reports. In addition, 78.5% of the respondents indicated that they are head(spouse) in their HH while the rest indicated that they are only member of the HH .
8	Residential Status/Length of residence	All of the sampled population indicated that they are permanent residents at their respective localities. In other words, they only work or do business on the campus and return to their houses. Furthermore, 42.86% that they have lived at their present respective communities for between 6 to 9 years while those that have lived at the present locations for 0 to 2 years and above 10 years' account for 21.87% and 35.27% respectively.
9	Income Characteristics	Monthly income indicated by the respondents are: below N50,000 (28.57%), N80,000 to N90,000 (14.29%), while those earning between N90,000 to N100,000 and those earning above N100,000 which are lecturers account for 28.57% and 14.31% respectively. It should be noted that some of the respondents particularly the monthly non-salary earners are unable to estimate their monthly income as a result improper financial record keeping.

Source: Field Survey, February 2023

3.12.4 Traffic Studies

ABU Zaria Main Gate to ACENPEE PROPOSED SITE

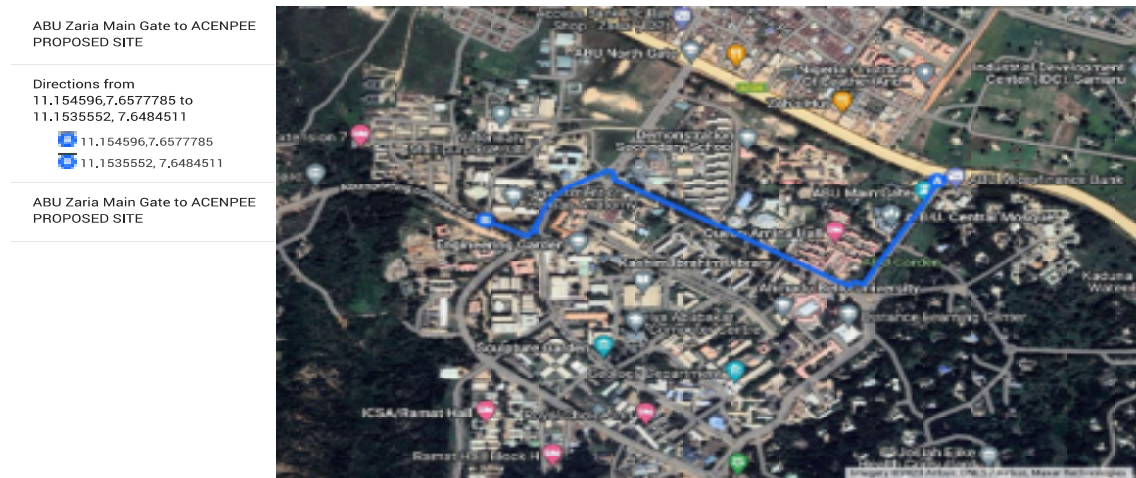


Figure 3.5: Traffic route from ABU main gate to ACENPEE proposed site

The traffic studies of the access roads, as seen in Figure 3.5 indicated that highest flow of vehicular traffic was experienced from the direction of the gate to the Project area only at peak hours to go to work and lecture rooms and back. Taking cognizance of the number of vehicular traffic along the project site access road, workers and residents around the project site and its environs may not experience heavier human and vehicular traffic during the construction work in view of the -low vehicular movements in the project area.

3.12.5 Household Solid Waste Management

The waste management method adopted by the users around the project area was examined. The prevalent methods of management include use of receptacles and dumping by roadsides for domestic and office generated waste.

As shown in Figure 3.6, the household solid waste management methods adopted by the respondents at the study community include: Waste Collectors 60%, Burning 15%, while refuse dump is 25%. Generally, waste management is the responsibility of the waste management arm of the PP&MS of ABU with designated central waste collection point where waste is collected on weekly bases by the ABU Municipal Services Unit of PP&MS. However, waste collection bins will be provided within the Centre for collecting wastes.



Figure 3.6a-b: Percentage distribution of Respondents based on Waste Disposal Methods
 Source: Field Survey, February 2023

3.12.6 Sources of Energy

Sources of energy are not the same everywhere and it varies from one household to another. As indicated, primary source of energy for lighting by the respondents is electricity supply from the national grid (65%), while those that depend on power generating sets as primary source of energy account for 25%. Other sources of energy indicated are the solar power, and batteries which constitute only 10% of the respondents. Meanwhile, mix energy use is common among many people in Nigeria due to unstable power supply from the National Grid. As regards energy for cooking, main sources indicated are cooking gas (70%), firewood (20%), charcoal (5%) and Kerosene 5%. It was observed that cooking with firewood is common among the food vendors while charcoal is mostly used by those selling roasted food. Cooking gas remains one of the sources of clean energies used around the world.

3.12.7 Sources of Water

Indicated sources of water for household use in the study area is majorly through the government water utility which dominated about 60% of the respondents, however other sources indicated by the respondents are boreholes/Well 35% and Rain harvesting 5%. Generally, households within the community depend on Government pipe borne water specifically at the project location except when there are issues.

3.12.8 Living Standard

Most of the respondents claimed that their standard of living has been the same over the previous three years. About 20% affirmed that it has been better while 25% indicated that it has got worse over the same period. Of those that claimed that the situation has got worse they gave reason that it was caused by the state of the country's economy occasioned by the effect of cashless policy and its consequences to work life and business. However, Majority of the respondents were excited about the proposed project and believed that the proposed project will improve the situation of some folks for employment opportunities and knowledge in the project community.

3.12.9 Local Economy

As a university community, it is expected that there would be other means of livelihood outside civil servants. Observed economic activities within the school ranged from commercial tricycle operators, Motor Cycle riders, local food vendors, information and computer technology (ICT)

services (such as computer/internet services and photocopy machine operator), POS vendors, Recharge card sellers and petty trading. Basically, the economic activities of the campus are dominated by retails.

3.12.10 Health Status and Health Management Method

Prevailing Sickness

Baseline health condition of the people of the study area was assessed through survey. The dominant health challenge/sickness indicated was Malaria (65%) while typhoid and cough/cattarrh account for 17% and 13% respectively. Other ailments such as cholera, pile, eye pains and stomach ulcer jointly account for 5% of the total sampled population.

According to the respondents most of these illnesses they suffer from are treated mostly by visiting a hospital/clinic, buying drugs from the local pharmaceutical stores and occasional traditional methods. Of those that visit hospital for health treatment, 40% indicated that they have visited within the last six months followed by those that have visited a health facility in the last one year (40%). About 12% of the sampled population have visited within the last five years while 8% had visited more than five years ago. The university has a health Centre/facility within the campus.

CHAPTER FOUR: ASSESSMENT OF POTENTIAL ADVERSE ENVIRONMENTAL AND SOCIAL IMPACTS

4.1 Screening and Scoping for Potential Impacts

The first step in identifying impacts associated with the project is the development of an interaction matrix which shows the relationship/ interaction between the project environmental and social components and planned project activities.

A modified version of the Leopold Interaction-matrix (Table 4.1) technique was employed to screen and scope for the potential impacts of the proposed Project on the environment. The basis for the screening was derived from the following:

- Knowledge of the Project activities.
- Detailed information on the environmental and socio-economic setting of the Project's area of influence.
- Consultation with relevant stakeholders.
- Review of other ESIA /ESMP reports on similar projects/environments.

Table 4.5: Project Activities – Leopold's Environmental and Social Interaction Matrix (Impact significance Matrix)

Summary of Project Activities at various Phases	Receptors															
	Physical					Biological		Socio-economic					Others (Health and Safety)			
	Air Quality	Ambient Noise	Soil	Groundwater and Aquifer	Landscape/Topography	Terrestrial Flora	Terrestrial Fauna	Land Use	Population	Utilities	Infrastructure	Employment/Income	Gender issues	Construction workers	Workplace health and safety	General Public
Pre-construction Phase																
Site selection								X								
Site clearing and preparation	X	X	X		X	X	X				X		X			
Mobilization of construction equipment and materials to site	X	X								X	X					X
Construction Phase																
Civil work activities including excavation, trenching, cable laying, foundation, construction of building	X	X	X	X				X			X	X	X			X
Installation of ancillary facilities, generator/ power storage batteries.	X	X	X									X	X			X
Waste generation and disposal			X	X						X	X		X			X
Commissioning Phase																
Testing of associated Infrastructure		X						X		X			X			X
Operational Phase																
ACENPEE Centre and facilities operation and provision of training for users		X									X	X		X		X
Routine maintenance; waste generation and disposal	X		X	X	X				X	X	X	X		X		X

The matrix was used to categorise ACENPEE project potential impacts as shown in Table 4.2.

Table 4.6: ACENPEE Project Impacts Categorisation

Project Activities	Associated and Potential Impacts	Direct	Indirect	Adverse	Beneficial	Reversible	Irreversible	Cumulative	Long term	Short term
Pre-construction Phase										
Permitting	Employment opportunities arising from recruitment of workers									
Stakeholders' engagement	Business opportunities for local contractors through sub-contracting activities									
Land Use	Loss of vegetation covers due to site clearing and preparation activities									
Recruitment	Skill acquisition and enhancements to locals and future workforce									
Land preparation and clearing	employment issues (quotas and methods)									
Construction Phase										
Mobilization to site	Influx of sub-contractors and suppliers and increase pressure on existing social infrastructure									
	Increased risks of accidents leading to injury and loss of asset during mobilization									
	Nuisance (noise and vibrations) from movement of heavy-duty equipment and vehicles affecting site workers and wildlife									
	Dust particles and vehicular emissions from increased movement									
	Generation of wastes such as scrap metal, wood, sand, concrete, paper, domestic waste etc									
Commissioning and Operational Phases										
Testing and commissioning	Generation of wastes									
Teaching facility maintenance and servicing	Increased opportunities and quality of life (small, medium, large scale) due to enhanced service delivery for users of the centre									
Teaching facility maintenance and servicing	Soil/ groundwater contamination from accidental petrol /engine oil spill during refuelling of vehicle and facility owned diesel or petrol generators									
	Workplace accidents/ incidents (cuts, trip, falls etc) leading to injury/ death of personnel during operations									
	Acquisition of skills by individuals to be employed to operate in the centre and ancillary facility									
	Acquisition of skills by individuals from the centre and ancillary facility									
Project Activities	Associated and Potential Impacts	Dire	Indi	Adv	Ben	Rev	Irre	Cu	Lon	Short

KEY

	Activity interacts with ecological or social component
	Activity does not interact with ecological or social component

4.2 Determination of Impact Significance

The significance of impacts that could occur due to the implementation of the project's activities were established based on three steps which are:

- Impact Magnitude which combines the extent, duration, scale and frequency of an impact
- Value/ Sensitivity/ Fragility and importance of the relevant Receptor;
- Identification of the impact significance, which is the cumulative indicator of both of the above two key variables.

The magnitude of an effect requires quantifying the sources of potential environmental and socio-economic effects from routine and non-routine project activities such as the extent of land clearing or predicted change in noise levels. On the other hand, the receptor sensitivity is derived from factors such as:

- Legislative controls;
- Designated status within the land use planning system;
- Number of affected individual receptors;
- Ability of the resource or receptor to absorb change; and
- Public perception about the criticality or sensitivity of the receptors.

The determination of impact significance also entails considering compliance with environmental policies, quality standards and set pollution limits.

4.3 Method for Determining Impact Magnitude

Potential negative impacts were assigned Negligible, Low, Medium, and High labels based on their magnitude while for positive impacts, it sufficed to indicate that the project is expected to result in a particular positive impact without assigning a magnitude to it.

4.3.1 Methods and Techniques used in assessing and analyzing the environmental and social impacts of the proposed construction

A risk assessment matrix (Table 4.3) was used to determine the risk of each individual environmental aspect relevant to the Construction of design studio complex and installation of ancillary equipment's. The level of risk determined from the matrix identifies the level of control measures required for that environmental aspect. These risks are to be mitigated through the application of measures identified in this ESMP.

Table 4.7: Risk Assessment Matrix

		Probability				
		A	B	C	D	E
Consequences	1	H	H	H	H	M
	2	H	H	H	M	M
	3	H	H	M	M	L
	4	M	M	M	L	L
	5	M	L	L	L	L

Explanatory notes on the selection of the consequence and probability for each issue are presented in Table 4.4 – Risk Matrix Explanation.

Table 4.8: Risk Matrix Explanation

Probability			Consequence		
A	Almost Certain.	Expected to occur, quite common.	1	Major	Major environmental harm. e.g. major pollution incident causing significant damage or potential to health or the environment. Fines and prosecution likely
B	Likely	Will probably occur, has happened	2	Significant	Long term or serious environmental damage. Numerous complaints received. Potential for prosecution. Loss of reputation
C	Possible	Might occur at some time	3	Moderate	Moderate environmental impact. Will cause complaints. Possible fine
D	Unlikely	Could occur at some time although unlikely	4	Minor	Minimal environmental harm. Potential for complaints. Fine unlikely.
E	Rare	Might occur at some time in exceptional circumstances.	5	Insignificant	Little or no environmental harm. Little potential for fines or complaints.

4.4 Potential Social and Environmental Impacts

The project is expected to have high positive environmental and social impacts for communities in the project area and the west African coast at large as it provides incentives for establishing innovation platform for knowledge flow and collective dialogue between, researchers, industries, commercial business and educational institutions in the region and increase in various commercial production, improved environmental management and livelihoods.

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. this risk is being mitigated with the preparation of all the environmental and social screening as well as the ESMP studies.

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.
- Public Safety issues
- risk of grievance and conflict

Positives impacts

- Increased and improved economic activities around the project site
- Temporary employment opportunity, business opportunity
- Construction of toilets and WASH facilities will promote hygiene and sanitation in the school and thus better health status for Construction workers
- Inclusion of safeguard processes and that will promote the sustainability of the project
-

Operation & Maintenance phase

During the occupancy and maintenance phase, ACENPEE project activities have positive impacts outlined and is not expected to pose any environmental or social problems. Nevertheless, Potential negative impacts might generally be due to:

Negatives impacts

- Waste management and disposal issues with Emission of bad odors
- Fire hazards
- 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
- Failure to take account of vulnerable people (disabled students, etc.)

Positive impacts

- Asset on the higher education system at national level
- Provision of additional facilities that help to bridge the gap in infrastructure in the education sector
- Increased enrollment in STEM education due to availability of more/conducive facilities
- Improvement of the aesthetics of the university site/ACE
- Development of green spaces around the building
- The building design is inclusive and takes into consideration ramps for people living with disabilities (PLWD)
- Inclusion of safeguard processes and security dimensions that will promote the sustainability of the project
- Increased economic activity around the university/ACE
- Improved student comfort and study conditions
- Increased economic activity around the university
- Employment opportunity, and business opportunity.

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.

adherence to mitigation measures proffered with regular supervision of the building sites by environmental experts.

4.5 Enhancement Measures for Identified Positive Impacts

4.5.1 Focus on practice-anchored intelligent engineering education

The Project will enhance Nigeria's intention of improving its Focus on practice-anchored intelligent engineering education that will produce a critical mass of future teachers/instructors for the new vision, as well as a new corps of engineering leaders to drive the vision of "the Africa we want", in addition to developing the next generation of scientists, researchers, teachers, entrepreneurs, and product developers, and enrolling new postgraduate students from Nigeria and the sub-region as envisaged in ACE I; and specifically apply and strengthen modern engineering design methodologies.

To enhance this impact, the following measures shall be implemented:

- Expand learning and research opportunities for postgraduate studies in all the key sectors consistent with the SDGs, by deploying existing and new advances in Technology; and
- Leverage on the cognate intellectual infrastructure and the output of the university and collaborating partners to serve as the launch pad for start-up digital/engineering companies borne out of university research, discovery and innovation activities, by partnering firms and emerging techpreneurs.

4.5.2 Direct employment and training

The Project will give rise to direct employment opportunities across different skill levels, from unskilled to highly skilled labour. It is estimated that during construction phase, at least 40 job opportunities would be created. Training for local people from skilled technicians shall also be carried out.

The following measures shall be implemented to ensure that direct employment and training opportunities are maximized:

- A Labour and Employment Management Plan (LEMP) shall be developed prior to construction, detailing percentages and numbers of the workforce to be sourced from the local area and various demographics as well as influx management. The plan shall follow local and international employment guidelines.
- The Project Management in conjunction with contractor shall provide notification to different groups in the community on specific jobs and skills required for the project, prior to the commencement of construction. Subsequently, the group leaders shall notify the local population prior to the commencement of construction of job opportunities and relevant skills/qualifications required to be employable on the Project.

- The Project GBV action plan shall be implemented to ensure that the Project does not increase women’s burden and that women not only contribute, but also benefit from it.
- The Project contractor shall initiate training and skills development programmes prior to the commencement of construction, as a means of ensuring that members of the local workforce are up-skilled and can be employed on the Project.

During the operational phase of the Project, job opportunities will also be created. About 10 people will be employed. This will be a mixture of skilled labour (such as electrical and mechanical technicians) and unskilled labour (such as cleaners and security personnel). Periodic capacity building will be offered to the workforce.

4.5.3 Procurement and indirect employment

The construction and operation of the proposed Project will create opportunities for the supply of goods and services to the Project and in turn, indirect employment will be created in the supply chain. Other opportunities for local companies to provide catering, waste / recycling and landscaping facilities, etc. will also be created. Local and regional procurement targets shall be included in the Project’s work plans to enhance potential opportunity.

The negative environmental and social impacts will largely be localized in spatial extent, short in duration, occurring within less sensitive environmental areas and are manageable through the implementation of appropriate mitigation measures. Based on the assessment, the potential environmental and social impacts are outlined in Table 4.5.

Table 4.9: Ranking Assessment Matrix Results

Aspect	Potential Impacts	Project Phases				Probability	Consequence	Risk Ranking	Controls
		Pre-construction	Construction	operational	decommissioning				
Visual Amenity	Degraded visual amenity due to untidy construction site and presence of plant and equipment.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	C	4	Low	See ESMP in Table 5.1.
Air Quality	Dust generated through demolition, clearance, upgrading, construction and installation works	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	C	5	Low	
Noise and vibration	Temporary elevated noise emissions during demolition/ Construction /upgrading/ installation (during weekdays and on the weekend) at neighbouring academic offices.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	C	4	Low	
Waste water /Water quality and hydrology	Discharge of contaminant laden runoff from accidental spillage of chemicals and fuels from the operation and maintenance of civil works plant and equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	D	4	Low	
	Discharge from contaminated storm water runoff from construction sites structures		<input checked="" type="checkbox"/>			C	3	Medium	
Waste Management	Potential contamination of land and water due to inappropriate handling and disposal of waste materials		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	D	3	Medium	
	Non-conformance with waste hierarchy and principles.		<input checked="" type="checkbox"/>			D	3	Medium	
Socio-economic	Safety and access impacts associated with the construction. Amenity Impact on stakeholders		<input checked="" type="checkbox"/>			D	3	Medium	
Cultural Heritage	Impact to any item of historic heritage significance during construction		<input checked="" type="checkbox"/>			E	4	Low	
Flora and fauna	Spread of exotic species		<input checked="" type="checkbox"/>			E	4	Low	
	Loss of vegetation from clearing		<input checked="" type="checkbox"/>			C	5	Low	
Cumulative impacts	Cumulative impacts on environment and community due to cumulative construction projects in the immediate vicinity		<input checked="" type="checkbox"/>			C	4	Medium	

Public & Workers safety	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 that may cause incidents or accident The extent of impact could be temporary or permanent		<input checked="" type="checkbox"/>			C	3	Medium	
Traffic disruption and accidents	Movement of trucks on routes leading to the site may hinder traffic movement of persons and institutional workers		<input checked="" type="checkbox"/>			C	3	Low	

CHAPTER FIVE STAKEHOLDERS CONSULTATION

5.1 Introduction

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. A plan was developed to involve the active participation of all stakeholders in decision-making processes, to foster dialogue and reduce tensions. ESMP questionnaires were equally administered to seek for the opinions and concerns of stakeholders. The key project stakeholders were identified for consultations, and these included the following:

- Ahmadu Bello University (ABU) (staff and students)
- Engineering Faculty Members (staff and Students)
- ACENPEE Centre (staff and Students)

5.2. Objectives of Consultation

The main objective of the consultations with stakeholders is to discuss the proposed project's environmental and social implications and to identify alternatives for consideration. Specifically, the consultations seek to achieve the following objectives:

- To provide some information about the proposed project;
- To provide opportunities for stakeholders to discuss their concerns and offer recommendations;
- To gain insight on the role of each stakeholder in the implementation of the environmental and social safeguards as well as structures in place for the management of the proposed facilities;
- To provide and discuss with stakeholders the alternatives considered to reduce anticipated impacts;
- To identify and verify significance of environmental, social and health impacts; and
- To inform the process of developing appropriate mitigation and management options.

5.3 Stakeholder Consultation Strategy and Plan

Stakeholder consultation is a process and would continue through the ESMP study stages to its implementation. The stakeholder engagement process involved the following:

- Identification of key stakeholders that will be consulted as presented in Table 5.1.
- Determine type of consultation approach {key informant interviews, Focus Group Discussions (FGD) etc.}
- Initiation of consultation that would continue through the lifecycle of the sub-project
- Incorporation of stakeholder concerns into the project design or implementation process

Table 5.1: Instruments of Consultation/ Data Collection and Target Groups

Samaru Community, Ahmadu Bello University, Zaria (ABU)			
Project LGA	Project Community	Locations	Instrument of consultation
Sabon-Gari	ABU, Main Campus	ACENPEE office	FGD

Sabon-Gari	ABU, Main Campus	Sassakawa / PG hostel	Questionnaire/FGD
Sabon-Gari	ABU, Main Campus	Security Department	FGD
Sabon-Gari	ABU, Main Campus	Physical Planning and Municipal Department	FGD

Source: Field Survey, (February, 2023)

5.4 Stakeholders Consulted

Stakeholder consultation meeting was held on Tuesday 21st and Friday 24th February 2023. The stakeholder consultations were held at two levels, these include meetings with Project proponent and consultations with project community. The outcome of the consultations with the project community shows a common pattern of concern in areas of sustainable management of the project. The consultations with the project proponent involved a team of inspection to the ACENPEE proposed construction project site and to address issues that may be of concern. The Centre Environmental and Safeguard Officer, Prof. (Mrs.) Fatima Badiru Ibrahim chaired the field inspection on Tuesday and Prof. Raymond B. Bako chaired the interactive session on Friday where it was 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, proposed project activities were also presented and discussed.

5.5. Stakeholders Engagement Outcome

The list of participants at the stakeholder consultation meetings is presented in annex -3. Concerns centred mainly on when the civil works will likely commence as well as involvement of people in the community as skilled and unskilled part of the labour force during the civil works. Other issues discussed are presented in Table 5.2.

Table 5.2: Concerns raised and how they were addressed

S/N	Issues raised during consultations	How they were addressed
	Issues raised in social gatherings	Some persons showed concerns about likelihood of dust pollution during construction. The contractor will put necessary measures in place to mitigate this impact by use of water that will be sprinkled to reduce dust.
	Issues raised during meetings with Women	Women feel discriminated as they are less involved in projects, and during employment they are not given as many opportunities as the men. There will be better sensitization to enable the contractor offer equal opportunities to women, where possible.

<p>Issues raised during meetings with Youths</p>	<p>The youths around the project area have expressed concern about employment opportunities during the project implementation.</p>	<p>Sourcing of local staff from the communities is part of the management plan to address concerns regarding labour influx.</p>
<p>Displacement and reallocation of students' accommodation</p>	<p>The students in the hostel expressed concerns over the loss of their accommodation and look forward to the new hostel promised them. They only expressed that adequate time be given them to move to the hostel provided in place of the current one.</p>	<p>The time expected for them to move is more than three months with the notice given to them. Thus, as part of the sensitization prerequisite of the ESMP, the cut-off date for them to move has been communicated to them by the Dean of Students Affairs.</p>

CHAPTER SIX: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

6.1 The Proposed Mitigation Measures

Effective waste management, control of water discharges and air emissions, as described below, are critical to reducing adverse ecological impacts from construction and operational phases of the Design Studio. In addition, the environmental management plans and monitoring indicators and techniques discussed below are recommended to further reduce potential ecological impacts.

The feasible, practical and cost-effective mitigation measures for identified impacts throughout the project cycle as outlined in Table 6.1 are discussed as appropriate with the requisite monitoring indicator on environmental and social management plan.

Table 6.3: The Environmental and Social Management Plan

Activities	Potential Impact	Mitigation Measures	Responsibility for Mitigation	Mitigation Cost (₹)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost
PRE-CONSTRUCTION PHASE											
ENVIRONMENTAL IMPACT											
1A. Site preparation, Procurement and transportation of required components to site.	Exhaust fumes of vehicles, equipment could cause air pollution and noise pollution	Install suitable mufflers on engine exhausts and compressors and ensure that all vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES). Fuel switching from high-to low-carbon content fuels (where available)	Work contractors and site engineer	100,000 for noise muffler 50,000 for emission reduction	SO ₂ , NO _x , CO, VOC, PM _{2.5} , PM ₁₀	In-situ measurement Site inspection	Air Quality Parameters are within permissible limits as documented by NESREA ¹ , Evidence of VET and VES, Evidence of compliance	Project area and within 1km	Bi-monthly/ Preconstruction Phase	ACENPEE-ACE environmental and social Safeguard Specialist	50,000
Site clearing, establishment of staging area and site office	Demolition of the old hostel. Management of demolition waste. Loss of vegetative cover and ornamental trees. Vegetal Waste Can pollute the environment or be dumped indiscriminately	Liaise with certified waste vendor for waste management (see waste management plan (WMP) in annex 10) Replant or revegetate trees/shrubs	Work contractors and site engineer	50,000 30,000	No of ornamental trees impacted Vegetal Waste on site	Site inspection Complaints received	Contractor compliance to stipulated measures Evidence of waste manifest	Project site and area	Weekly	ACENPEE-ACE environmental and social Safeguard Specialist	10,000
	Open defecation	Contractors to make provision for toilet	Work contractors and site engineer	500,000 (for 2 units)	Presence of open	Site Inspection	Presence of site toilets and	Project Site	Daily	ACENPEE-ACE environmental	

¹ National Environmental (Air Quality Control) Regulations, 2014

	by contractor workers lead to air, land and underground water pollution	facilities for workers (mobile toilets or constructed toilets with attached sewage system): male and female toilets to be separate			defecation on site Complaints from stakeholders near the sites	No of Complaints received	WASH facilities for workers				and social Safeguard Specialist	
SOCIAL IMPACT												
1B. Site preparation Procurement and transportation of required components to site. Site clearing, establishment of staging area and site office	Public and worker safety	The public shall be notified of the works through appropriate notification in the University media and/or at publicly accessible sites within the project area	Work contractors and site engineer	250,000	Notification to both the public and workers	Pictures of public notification Signage placement at strategic part of site	Notification signage in appropriate place	Site location	Regularly		ACENPEE-ACE environmental and social Safeguard Specialist	50,000
		All legally required permits shall be acquired for demolition/ construction installation/ and/or upgrade	Work contractors and site engineer	50,000	Site specific regulatory Permits	Citing	Permits obtained	Project office	Once		ACENPEE-ACE environmental and social Safeguard Specialist	
		The environmental and social safeguard clauses shall be given to the Contractor in bidding documents and contractor shall formally agree that all work will be carried out in an environmentally and social safe manner designed to minimize impacts on neighboring residents and environment	Work contractors and site engineer		Contractors safeguards code of conduct	Record of notification to contractor	Contractors commitment in writing	Project office	Once		ACENPEE-ACE environmental and social Safeguard Specialist	
		Workers' PPE shall comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots)	environmental and social Safeguard Specialist	200,000	Site specific standard PPE	Citing PPE in place Workers instruction/ training for use	PPE in use by workers appropriately	Site area	regularly		ACENPEE-ACE environmental and social Safeguard Specialist	
		Appropriate signposting of the sites will inform workers of key rules and regulations to follow	environmental and social Safeguard Specialist	200,000	Site specific signposting	Citing of signposting in appropriate language(s)	Signposting understood by workers	Site area	Once		ACENPEE-ACE environmental and social Safeguard Specialist	
	Increase in noise level above	Ensure proper consultation with affected stakeholders to intimate	Work contractors and site engineer / ACENPEE	Already capture under the	Number and frequency of	Consultations	Absence/low complaints	Project area	weekly	ACENPEE-ACE environmental and social	50,000	

	permissible noise level, (60dB and 40dB for day and night respectively) can disturb academic activities	them on planned project activities Retrofit machines with sound proofing devices Avoid work at night (beyond 6pm)	environmental and Social safeguard Team	Environmental section	complaints in project area	Complaint reports				Safeguard Specialist	
	Delay in travel time due to traffic congestion Risk of vehicular/pe destrian accidents/ damage to facilities	Contractor to provide the drivers on do's and don'ts of transport of materials & equipment within the University project area and assist with fleet management Use trained drivers, use flagmen at sensitive points and during peak periods such as Friday praying period	Work contractors and site engineer	50,000	No of complaints/ incidents in the project area	Observation Complaints from stakeholders, Incident reports	Compliance to stipulated mitigation measures Absence/low complaints and Incidents	Project Area	Weekly	ACENPEE-ACE environmental and social Safeguard Specialist	
	General occupational health safety and environmental impacts	Contractor plan for worker's sensitization on, and Code of Conducts against misconduct/SEA/GBV/SH (see annex 7-9 for sample CoC) PPMDC and ACENPEE social specialist plan to sensitize their students against illicit relations with contractor workers with site notification against SEA/GBV/SH Contractors Construction ESMP Contractors company HSE Manual/ site specific Occupational Health and Safety Management Plan (OHSMP) see annex 6 for sample The OHSMP will entail: - Provision of Hazard Communication Procedures (HAZCOM); Job Hazard Analysis	Contractor in liaison with ACENPEE Project Team for Response and Prevention of Sexual and Gender Based Violence Contractor	100,000	Notification for zero tolerance for GBV/SEA/SH on site No of workers expected to be recruited and trained by the plan No of workers who signs CoC Compliance with OHSMP	Training records and Interviews/ consultations with workers Site inspection	All workers are trained on CoC Facility managers have sensitized menial workers HSE/OHS Training reports and list of attendees	Project area of influence Project Site	Weekly Weekly	ESO Director, in charge of GBV issues ACENPEE Centre Coordinator ACENPEE-ACE environmental	100,000 50,000

		(JHA); OHS Training program Provision of adequate first aid, PPE, safety signage's		200,000 for training of workers on OHS 100,000 for PPEs for pre-construction phase	No of workers Trained on HSE/OHS No of accidents, incidents or injuries Availability and use of appropriate PPEs First Aid Kits On-site security Fumigation activity	Consultation Incident reports HSE Statistics Board	Evidence of Compliance to OHSMP Evidence of use of PPES, caution signs onsite, well-stocked first aid kits			and social Safeguard Specialist	
				Total Mitigation Cost (Pre-construction Phase)							Total Monitoring Cost (preconstruction Phase)
Total				1,350,000.00							310,000
Activities	Potential Impact	Mitigation Measures	Responsibility for Mitigation	Mitigation Cost (\$)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost
CONSTRUCTION PHASE											
ENVIRONMENTAL IMPACTS											
2A) Movement of materials, vehicles, and equipment to site Construction works	Exhaust fumes of vehicles and equipment (NO _x , CO, SO _x , SPM, GHGs) could cause air pollution and noise pollution	Install suitable mufflers on engine exhausts and compressors and ensure that all vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES). Fuel switching from high-to low-carbon content fuels (where available) Turn off machines when not in use Avoid work at night (beyond 6pm)	Contractor	100,000 (for mufflers) 200,000 for emissions reduction	SO ₂ , NO _x , CO, VOC, PM _{2.5} , PM ₁₀ Noise level	In-situ measurement Site inspection	Parameters are within permissible limits as documented by NESREA ² , VET/VES Report, Noise level below 60dB for day	Project area	Monthly	ACENPEE-ACE environmental and social Safeguard Specialist	100,000

² National Environmental (Air Quality Control) Regulations, 2014

2A. Movement of materials, vehicles, and equipment to site Constructio n works	Air quality	Construction phases dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site	Work contractors & Site engineer	370,000	Dust monitoring results Particularly suspended particulates (TSP, PM10, or SO ₂ , NO _x , CO, THC)	Air quality equipment. On a need basis at the start of preconstruction /Construction of work areas and subsequently during operational phase.	Adherence to measures	Constructio ns corridors	On spot weekly inspection	Work contractors & environmental Safeguard Specialist	50,000
		During construction phases debris shall be kept in controlled area and sprayed with water mist to reduce debris dust	Work contractors & Site engineer		Dust monitoring results Particularly suspended particulates (TSP, PM10, or SO ₂ , NO _x , CO, THC)		Technical Specification Sheet				12,000
		The surrounding environment (sidewalks, roads) shall be kept free of debris to minimize dust	Work contractors & Site engineer		Dust monitoring results Particularly suspended particulates (TSP, PM10, or SO ₂ , NO _x , CO, THC)		No extensive dust blow				12,000
		There will be no open burning of construction / waste material at the site	Work contractors & Site engineer	20,000	Dust monitoring results Particularly suspended particulates (TSP, PM10, or SO ₂ , NO _x , CO, THC)		Use of equipment and vehicles in appropriate technical conditions. Provision of emissions control equipment where applicable (e.g. filters).				12,000

	Waste management	Waste collection and disposal pathways and sites should be identified for all major waste types expected from demolition and construction activities.	Maintenance contractor and staff	240,000	Waste management plan taking cognizance of waste sorting/segregation, treatment and appropriate waste disposal Waste temporary storage sites	Waste management plan in place	Adherence to measures in waste management plan The records of waste disposal will be maintained as proof for proper management as designed.	Construction areas	Regularly/daily	ACENPEE-ACE environmental Safeguard Specialist	15,000
		Demolition wastes should be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers and disposed properly by licensed collectors	Maintenance contractor and staff	250,000	Waste management plan		Adherence to measures in waste management plan The records of waste disposal will be maintained as proof for proper management as designed.	Construction areas	Regularly/daily	ACENPEE-ACE environmental Safeguard Specialist	
		Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)		25,000	Waste management plan		The records of waste reused and recycled will be maintained as proof for proper management as designed.	Construction areas	Regularly/daily	ACENPEE-ACE environmental safeguard specialist	
Construction works Operation of staging area	Open defecation by contractor workers lead to air, land and underground water pollution	Contractors to make provision for toilet facilities for workers (mobile toilets or constructed toilets with attached sewage system): male and female toilets to be separate	Contractor	200,000 for maintenance	Presence of open defecation on site Complaints from stakeholders near the site	Site Inspection No of Complaints received	Presence of site toilets and WASH facilities for workers	Project Site	Daily	ACENPEE-ACE environmental and social Safeguard Specialist	

	Soil and groundwater contamination by oil spills, lubricants and other chemicals	Site oil and lubricants should be kept on an impervious base and should have drip pans Locate storage area far from boreholes, all containers should be clearly labeled	Contractor	50,000	Soil quality Parameters (heavy metals) Fuel/chemical storage procedures	Site inspection Laboratory test of soil samples	Good house-keeping Chemicals labelled on site Soil quality Parameters within permissible limits	Project site	Weekly	ACENPEE-ACE environmental and social Safeguard Specialist	
Drilling of borehole	Risk of aquifer over-exploitation and pollution of ground water resources due to borehole drilling and if borehole is situated too close to septic tanks for the toilet facilities	Adhere to borehole specification in ABU in liaison with PP&MS Use sanitary seal to protect borehole water, ensure 18m to the septic tank, Care must be taken in the handling and storage of all drilling fluids, oils, greases and fuel on site. The completed boreholes must comply with minimum WASH standard on borehole Drilling. Boreholes must be developed after completion of drilling, after casing, screen and filter pack are installed	Contractor in conjunction with PP&MS	Part of contractual borehole drilling cost	Location of borehole onsite Borehole specifications Groundwater quality parameters especially heavy metals, BOD, COD	Site inspection Borehole drilling report Lab analysis of groundwater samples	Compliance with siting location and specifications Parameters within permissible limits of FMEnv ³	Project Site	Quarterly	ACENPEE-ACE environmental and social Safeguard Specialist PP&MS department	N/A
Material sourcing	Building materials could be obtained from illegal vendors or from illegal/restricted areas	Contractor to ensure materials are sourced from established markets and licensed vendors	Contractor	N/A	Contractors due diligence	Interview/consultation	Contractor ensures materials are sourced from established markets and licensed vendors	Project area of influence	Quarterly	ACENPEE-ACE environmental and social Safeguard Specialist	50,000
	Chance find procedure	Avoid further work in such areas	Work contractors	20,000	Heritage resources,	On a need basis during	Adherence to measures	Construction areas	Regularly	Site engineer	15,000

³NIGERIAN INDUSTRIAL STANDARD NIS-554-2015: Nigerian Standard for Drinking Water Quality

		Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and Bureau of Art and Culture take over		10,000	particularly archaeological etc.	construction phases Log book of chance finds	Satisfactory implementation of current management controls for Chance Finds			Social Safeguard specialist	
Activities	Potential Impact	Mitigation Measures	Responsibility for Mitigation	Mitigation Cost (0)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost
	Toxic / hazardous waste management	Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information	Works contractor	35,000	List of chemicals likely to be used, their respective quantities and storage facilities; and Details on the mode of disposal of empty vials, chemicals containers and expired chemicals. Waste Management plan and its compliance	Log book	Adherence to measures in waste management Plan	Construction areas	Regular /daily monitoring	Safeguard specialist	15,000
		The containers of hazardous substances shall be placed in a leak-proof container to prevent spillage and leaching		55,000		Log book	Adherence to measures in waste management Plan	Construction areas	Regular /daily monitoring	Environmental Safeguard specialist	15,000
		The wastes shall be transported by specially licensed carriers and disposed in a licensed facility.		Log book		Adherence to measures in waste management Plan	Construction areas	Regular /daily monitoring	Safeguard environmental specialist		
		Paints with toxic ingredients or solvents or lead-based paints will not be used		Log book		Adherence to measure in waste management Plan	Construction areas	Regular /daily monitoring	Environmental Safeguard specialist		
Activities	Potential Impact	Mitigation Measures	Responsibility for Mitigation	Mitigation Cost (₹)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost

Status of Vegetation	Vegetation clearance and potential impact on the disturbance and destruction of Biodiversity	Surveys of existing invasive species populations prior to construction Prepare a Vegetation clearing and debris Management. Plan. to include • Invasive plant control measures to manage established invasive species populations and to prevent invasive species establishment.	Site engineer	25,000	Vegetation (sample) collection around the entire project area; and wildlife sampling through An interview with renowned hunters	Vegetation clearing and debris management plan in place	Adherence to specific avoidance and minimisation measures in the Vegetation clearing and debris management plan Tracking changes in the status of listed species	Construction corridor	Quarterly	ACENPEE-ACE environmental safeguards specialists	15,000
SOCIAL IMPACT											
Construction works Operation of staging area	Noise	Construction noise should be limited to restricted times agreed to in the work permit	Work contractors & Site engineer	20,000	Noise levels not to exceed 90dB(A) Records of equipment maintenance	Air quality Equipment On a need basis at the start of preconstruction /Construction of work areas and subsequently during operational phase	Adherence to measures		Regular on spot inspection	Work contractors & environmental Safeguard Specialist	
		During operations, the engine covers of generators, air compressors and other powered mechanical equipment shall be closed.	Work contractors & Site engineer ACENPEE-ACE safeguard specialist		Noise levels not to exceed 90dB(A) Records of equipment maintenance	On a need basis at the start of preconstruction /Construction of work areas and subsequently during operational phase	Adherence to measures	Construction areas	Regular on spot inspection	Work contractors & environmental Safeguard Specialist	
	Occupational Health and Safety	Provide H&S Training to the construction workforce (including sub-contractors, temporary workers and drivers)	Works contractor	170,000	Training performed and recorded	Check Training records	Adherence to measures	Construction areas	Regular on spot inspection	Work contractors & environmental and social Safeguard Specialist	15,000
		Ensure site premises are provided with appropriate fencing (where applicable) and lighting. Use hazard notices/signs/barriers to prevent access to dangerous areas.	Work contractors & Site engineer		H&S planning of construction site done, items installed						

		Ensure speed limits on site and on transporting routes.	Work contactors & Site engineer		Speed signs installed	Random site inspection	Compliance level	Transporting routes	Regularly	environmental and social Safeguard Specialist	
		Ensure the use of Personal Protective Equipment (PPE) for workers.			PPE used on-site by workers	Random site inspection	Correct use of PPE	Among workers	Regularly	environmental and social Safeguard Specialist	
	Labour Rights	Ensure that all workers have access to and are aware about the Grievance Mechanism	ACENPEE PIU/ Contractor	10,000	Grievance Mechanism in place and grievances recorded	Review of grievance register	Level of grievance address and resolved	Among the workers	Once	Safeguard Specialist (social) University gender	
		The Project GBV action plan shall be implemented to ensure that the Project does not increase women's burden and that women not only contribute, but also benefit from it.									
	Workers may be exposed to poor welfare	Contractor to provide required facilities for staff on-site including good food, portable water, toilet and WASH facilities (different male and female toilets) Sign MOU with the ABU Health Services to enable workers access to medical care when required	Contractor	Captured in social impacts above 300,000 (health services) contractor management should also have contingency fund for emergency	Availability of facilities on site	Visual inspection Consultation with workers	Evidence of facilities on site MOU with health services	Project site	Weekly	environmental and social Safeguard Specialist	
Activities	Potential Impact	Mitigation Measures	Responsibility for Mitigation	Mitigation Cost (₦)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost

Traffic and Pedestrian Safety	Direct or indirect hazards to public traffic and pedestrians by construction activities	In compliance with national regulations the contractor will insure that the rehabilitated and construction site is properly secured and related traffic regulated. This includes but is not limited to Signposting, warning signs, barriers and traffic diversions:	Work contractors and site engineer	35,000	Delivery plan on Project site routes and environ	Citing of traffic management delivery plan	Adherence to measures in the traffic management	Construction areas	Regularly /weekly	Environmental and social Safeguard specialist	15,000
		Site will be clearly visible and the public warned of all potential hazards				Provision of safe passages and crossings for pedestrians where upgrading / construction traffic interferes					
		Traffic management system and staff training, especially for site access and near-site heavy traffic.				Driver Training Records as part of Induction training					
		Organise carpools/buses for worker transportation where possible to avoid additional traffic pressure.				Carpools/ buses used					
		Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours.				Peak hours on local roads avoided, Grievance Mechanism					
		Prevent storage of construction materials, equipment and machineries on traffic lanes.				Dedicated storage areas in place					
Activities	Potential Impact	Mitigation Measures	Responsibility for Mitigation	Mitigation Cost (₦)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost
				Total Mitigation Cost (Construction Phase)							Total Monitoring Cost (Construction Phase)
				1,935,000.00							341,000

OPERATIONAL PHASE											
ENVIRONMENTAL IMPACT											
Solid waste management	Waste Materials, electrical/electronic waste, Packaging items/scraps Food scraps, Used ventilation filters, unused / used cleaning materials, from operational phases.	Maintaining records of waste Maintain good working condition to prevent spills, or waste litter with the ground, or exposure to rain and wind; Segregate waste in adequate receptacles and dispose as required under national regulations	ACENPEE-ACE PIU	720,000	Expected volume of other solid wastes generated such as empty containers, domestic wastes, empty vials and packing materials, on a daily or weekly basis	Records of waste management	Adherence to measures in waste management plan	Operational areas of project	Daily or weekly basis	Environmental Safeguard specialist	15,000
Individual waste water Treatment	Water quality	The approach to handling sanitary wastes and wastewater from building sites (installation) must be approved by the local authorities as applicable.	ACENPEE-ACE PIU	20,000	On project site and linkage to receiving water bodies	Waste water discharge	Adherence to measures in waste management plan	Operational areas of project	Regular inspection of waste water discharge as applicable	Environmental Safeguard specialist	
		Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment			On project site and linkage to receiving water bodies	Waste water discharge	Adherence to measures in waste management plan Monitoring of new wastewater systems (before/after) should be carried out	Operational areas of project	Regular inspection of waste water discharge as applicable	Environmental Safeguard specialist	
Activities	Potential Impact	Mitigation Measures	Responsibility for Mitigation	Mitigation Cost (N)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost
Flies and rodents with respect to operational facilities	Poor sanitation and hygiene, disease /pest infestation	Maintain structures to keep out pests (e.g. plug holes, seal gaps around doors and windows);	ACENPEE-ACE PIU	45,000	Regular cleaning and good sanitation practices	Visual observation of pest control measures is in place	Adherence to measures sanitation practices	Operational areas	Regularly/daily	ACENPEE-ACE PIU environmental safeguard specialist	15,000
		Use mechanical controls (e.g. traps, barriers, light,	ACENPEE-ACE PIU								

		and sound) to kill, relocate, or repel pests;									
		Use good housekeeping practices in facilities to limit food sources and habitat for pests									
		Improve drainage and reduce standing water to control mosquito populations;									
Activities	Potential Impact	Mitigation Measures	Responsibility for Mitigation	Mitigation Cost (₹)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost
Occupational health and safety	Chemical Pollution	The contractors / consultant to develop a Health and Safety Policy and procedures to guide the operational activities.	ACENPEE-ACE PIU	720,000	Health and Safety Policy and procedures in place	Adherence to health and safety procedure	Records on frequency, type, and source of illness/accident/injury Records on non-compliances Frequent illness of workforce medical fitness, workplace accident	Work places	Bi- annually during operational phase	Environmental and social Safeguard specialist ACENPEE-ACE PIU	20,000
		All workers should be given proper induction/ orientation on safety. Conducting of Health and safety durbars to sensitize workers on risk of accidents and occupational diseases	ACENPEE-ACE PIU		Training content and records	Inspection	Training records and job permits	Work place			20,000
Disposal of hazardous waste in course of maintenance works	Toxic pollution	Infrastructure for hazardous waste containment / management in place. Engage experienced artisans for any operational work.	ACENPEE-ACE PIU	12,000	Availability and proper use of PPE's during maintenance and cleaning works	inspection	Issuance of job permits and Use of PPEs	Work places		Environmental Safeguard specialist ACENPEE-ACE PIU	10,000
Activities	Potential Impact	Mitigation Measures	ACENPEE-ACE PIU	Mitigation Cost (₹)	Parameters to be Measured	Method of Measurement	Performance Indicator	Sampling Location	Monitoring Frequency	Responsibility for Monitoring	Monitoring Cost

		Regularly service all equipment and machinery to ensure they are in good working condition.	ACENPEE-ACE PIU	15,000	Record of equipment maintenance	Records/ log book inspection	All emergency response equipment are functional	Operational areas	Quarterly	Environmental and social Safeguard specialist ACENPEE-ACE PIU	10,000
		Ensure there are first aid kits on site and a trained person to administer first aid.	ACENPEE-ACE PIU	15,000	Staff awareness of health and safety	Health and safety procedures in place	All employees in the facility have Practical skill sets and culture on health and safety	Operational areas	Quarterly	Environmental Safeguard specialist ACENPEE-ACE PIU	11,000
SOCIAL IMPACTS											
Operation of facility	Vulnerable groups may be excluded from benefitting from the facilities	Contractor to comply with design of provision of access ramps to all floors/rooms	Contractor	Part of design costs	Access ramps Users with disabilities	Visual observation	Access ramps provided Identified PLWD	Project building	One off	Environmental Safeguard specialist ACENPEE-ACE PIU	N/A
Emergency preparedness and response	Emergency on site	Develop and implement a project-specific Emergency Preparedness and Response Plan for the operational phase covering the risks on local communities.	Work contactors & Site engineer PIU	207,000	Staff awareness of health and safety	Emergency response plan in place	Staff regularly performs mock drills in case of emergency response	Operational areas	Regularly	environmental Safeguard specialist ACENPEE-ACE PIU	10,000
		Develop measures/systems for collaboration with the local communities and other external parties including local governmental agencies, media, etc. where necessary.		42,000	Test all early warning systems and alarms						12,000
		Where necessary, communicate the details of the nature of the emergency, protection options, etc. through trained community liaison officer(s).		35,000	Test all early warning systems, alarms and communications.	Communication channel established		Operational areas	Regularly	environmental Safeguard specialist ACENPEE-ACE PIU	15,000

				Total Mitigation Cost (Operation Phase)							Total Monitoring Cost (Operation Phase)
Total				1,831,000							138,000
DECOMMISSIONING PHASE											
	Decommissioning of facility	Risks of occupational accidents and injuries to workers.	Develop & implement a Occupational Health and Safety Plan (OHSP) to manage the decommissioning phase. Restriction of unauthorized access to all areas of high-risk activities. Provision of specific personnel training on worksite OHS management	Contractor	N/A	OHSP developed Usage of appropriate PPE Usage of signage	Visual observation	Facility area	On a need basis	Regulatory authority and PP&MS of ABU	

6.2 Capacity Building

Implementing efficiently and effectively the ESMP requires the right set of knowledge and skills. All persons responsible as listed in Table 6.2 shows the role and responsibilities of stakeholders to be undertaking work during the life of the project. Table 6.3 is the recommended training course outline, contents and schedules for the consideration of the PIU for implementation of the ESMP throughout the Project cycle, which personnel must be trained on the contents of the ESMP, as it is important that all site personnel have a basic level of environmental awareness.

Table 6.4: The Roles and Responsibilities of the Stakeholders in the Implementation, Monitoring and Review of the ESMP

S/N	Stakeholder	Roles and Responsibilities
1	ACENPEE-ACE PIU	<ul style="list-style-type: none"> • Liaise closely with Kaduna State Environmental Protection Board in preparing a coordinated response on the environmental and social aspects of project development respectively as required; • Safeguards due diligence • In case of any violations on arising works, PIU will request contractors to amend and correct the violation. • Receive and supervise the environmental report from the Independent Environmental Consultant (IEC), • PIU's Safeguard Specialist will be in charge of review environmental report and recommend further actions. • Cooperate with WB to periodically supervise contractors' activities. • Weekly meetings will be held between Contractors, PIU, and consultants. In addition, PIU is to have assigned personnel for regular inspection.
2	Kaduna State Environmental Protection Board	<ul style="list-style-type: none"> • Environmental compliance Coordinator at the State level • Lead role - provision of advice on screening, scoping, review of draft ESMP report (in liaison with Federal Ministry of Environment) • Liaise with contractors to support the collection/evacuation of waste from the project sites • Ensure management of project waste in line with best environmental practices as not to degrade or pollute the environment. • Conduct periodic monitoring of environmental parameters to ensure compliance with environmental regulations • Site assessment and monitoring of ESMP implementation
3	Federal Ministry of Environment	<ul style="list-style-type: none"> • Lead role - provision of advice on screening, scoping, review of draft ESMP report (in liaison with State Ministry of Environment), • Receiving comments from stakeholders, public hearing/ review of the project proposals, and convening a technical decision-making panel arising from the public disclosures, • Project categorization for EA, Applicable standards, Environmental and social liability investigations, Monitoring and evaluation process and criteria
4	Other MDAs	<ul style="list-style-type: none"> • Other MDAs come in as at when relevant areas or resources under their jurisdiction or management are likely to be affected by or implicated by projects. • They participate in the EA processes and in project decision-making that helps prevent or minimize environmental and social impacts and to mitigate them. These institutions may also be required, to issue a consent or approval for an aspect of a project; allow an area to be included in a project; or allow

		impact to a certain extent or impose restrictions or conditions, monitoring responsibility or supervisory oversight
5	World Bank (WB)	<ul style="list-style-type: none"> • Overall supervision and provision of technical support and guidance. • Recommend additional measures for strengthening the management framework and implementation performance; • Supervising the application and recommendations of sub- project ESMPs.
6	Safeguards Unit	<p>Environmental Safeguard Officer</p> <ul style="list-style-type: none"> • Analyze potential community/individual sub-projects and their environmental impacts; • Ensure that project activities are implemented in accordance to best practices and guidelines set out in the site specifics; • Identify and liaise with all stakeholders involved in environment related issues in the project; and • Be responsible for the overall monitoring of mitigation measures and the impacts of the project during implementation. • Lead the process of Disclosure of the ESMP <p>Social Safeguard Officer</p> <ul style="list-style-type: none"> • Develop, coordinate and ensures the implementation of the social aspects of the ESMP; • Ensure the operationalisation of Grievance Redress Mechanism (GRM) on the project • Periodically monitor the GRM to ensure it is effective and fit for purpose • Identify, and address issues of GBV in liaison with the Kaduna State Ministry of Women and Children Affairs • Ensure project beneficiaries and host communities are adequately sensitised about the available reporting channels and how to access them • Identify and liaise with all stakeholders involved in social related issues in the project; • Conduct impact evaluation and beneficiaries' assessment; and • Establish partnerships and liaise with organizations, Community Based Organizations (CBOs) and Civil Society Organizations (CSOs).
7	Works Contractor	<ul style="list-style-type: none"> • After receiving and committing to the environmental procedures and Management Plans, • Contractors must fully carry out the measures of the environmental protection, health and safety procedure as indicated; • Any changes related to Environment, health and safety procedure must be informed to PIU for approval • In case of any violations on arising works either detected by Environmental consultant, Safeguard Specialists, or new arising works proposed by contractors, they must be reported to PIU for further actions. • If contractors decided to not follow instruction from PIU, construction activities will be halted until necessary actions are taken. • Contractors must assign at site, personnel in charge of Environment, health and safety procedure. • Compliance to BOQ specification in procurement of material and construction • Provide oversight function during construction and decommissioning
8	Facility Management Unit (FMU),	<ul style="list-style-type: none"> • Primary responsibility for all maintenance works, waste management, electrical, plumbing, water supply, and lawn maintenance. They will also play key roles during the construction and operation phases of the project
9	Physical Planning and Municipal	<ul style="list-style-type: none"> • Provide supervisory roles for various aspects or phases of construction works within the ABU. The department constitutes other units including Project Planning & Development (PP&D), Project Monitoring &

Services Department (PP&MS)	Evaluation (PM&E), Electrical Engineering Works (EEW), Mechanical Engineering Works (MEW), Civil/Building Works (C&BW), and Estate & General Duties (E&GD).
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6.3 Capacity Building Requirements

Based on the assessment of the institutional capacities of the different agencies that will be involved in the implementation of the ESMP, the following broad areas of capacity building have been identified and recommended for the PIU and other relevant agencies for effective implementation of the ESMP.

It is important to ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include among others:

- What Is Meant by “Environment and Social Risks and its Management on Projects”?
- World Bank Safeguards Policies and the Environmental and Social Standards(ESS)
- Why the Environment Needs to Be Protected and Conserved.
- How Construction Activities Can Impact on The Environment.
- Construction Health Safety and Environment
- What Can Be Done to Mitigate Against Such Impacts?
- Awareness and Practical session of Emergency and Spills Response Provisions.
- Social Responsibility during Construction e.g. being Considerate to Local Residents.
- The Environmental and Social Management Plan (ESMP);
- Environmental and Social Monitoring and Audit;
- Solid Waste and waste water Management;
- Environmental Reporting.

Table 6.5: Recommended Training Courses

S/N	Proposed Training Topics	Course Content	Proposed Schedule	Target audience	Duration	Estimated Cost/ Budget Naira
1	Understanding Safeguard Policies and the ESS standards of the World Bank and its linkages to projects and sub-projects	<ul style="list-style-type: none"> • What Is Meant by World Bank Safeguards Policies? • How Projects / sub project execution Activities Can Impact on the Environment. • Screening of projects to categories • Understanding of tools for implementing Safeguard Policies 	Within the first Six months of Project commencement	Officers of PIU Relevant staff of ABU /State agencies	2 days	600,000
	Environmental & Social Safeguard Monitoring, Reporting and due diligence on projects	<p>Awareness of Emergency and Spills Response Provisions with practical sessions</p> <ul style="list-style-type: none"> • Social Responsibility during Construction E.g., Being Considerate to Local Residents. • Rain harvesting to manage storm run-off in project area. • The Environmental and Social Management Plan (ESMP) implementation; • Environmental and Social Monitoring and Audit; 		Safeguard Specialist other relevant MDAs, LGA departments, NGOs, CBOs., Contractor		

		<ul style="list-style-type: none"> • Solid Waste Management; Proper selection, handling, storage, application, use, and disposal of all hazardous materials and chemicals used in the Project activities in accordance with the Chemical Management Plan; 				
2	Introduction to Construction HSE	<ul style="list-style-type: none"> • Overview of Health and Safety Hazards in Construction • Incidents: Causation, Investigation & Reporting • Excavation Safety • Construction Site Inspection • Personal Protective Equipment • Contractors, Code of Conduct 		Contractor 's Personnel, Local community	1day	150,000
		<ul style="list-style-type: none"> • training on GBV issues • Mitigation, roles & responsibilities, monitoring and budgeting; 		Specialist other relevant MDAs, LGA departments, NGOs, CBOs., Contractor 's Personnel, Local community	1 day	150,000
3	Estimated Total Cost					900,000

6.4. Implementation Schedule

The activities related to environmental management and monitoring must be integrated in the overall construction schedule. The project implementation phase is estimated for 6 months for the construction activities and One month of preconstruction preparatory activities. The implementation schedule is presented in Table -6.4

Table 6.4:- Implementation Schedule

S/ N	Activity Description	Responsible Persons	Timelines												Operational Phase
			Weeks				Months								
			Pre-construction				Construction Phase								
			1	2	3	4	1	2	3	4	5	6			
1.	Clearance and Formal Disclosure of ESMP	PCU	Yellow	Yellow	Yellow	Yellow									
2.	Inclusion of E&S Requirements in bid documents	PCU	Brown	Brown	Brown	Brown									
3.	Allocating Budget for ESMP	PCU	Purple	Purple	Purple	Purple									
4.	Appointing Support Staff for ESMP	PCU		Blue	Blue	Blue									
5.	Review & Approval of Contractor's E&S Plans	PCU		Orange	Orange	Orange	Orange								
6.	Finalization of Engineering Designs	PCU/ Consultant	Purple												
7.	Mobilization to site Site Clearing	Contractor					Cyan								
8.	Construction Phase	Contractor					Green	Green	Green	Green	Green	Green	Green	Green	Green
9.	Implementation of Mitigation	PCU/ Contractor					Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green
10.	Supervising ESMP Implementation	PCU					Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
11.	Monitoring & Reporting on ESMP Implementation	PCU/ MDAs					Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
12.	Environmental and Social Training	E&S Consultant				Green	Green								
13.	Environmental and Social Auditing	PCU/S ME /Consultant								Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
14.	Decommissioning Phase	PCU/S ME /Contractor													Brown
15.	Operations Phase	PCU/S ME /Contractor													Green

6.5. Contractual Measures

The Project contractor needs to be aware of the ESMP and shall place the highest priority on environment health and safety and shall maintain a safe working environment during performance of the Work. Contractor shall comply, and shall secure compliance by its employees, agents, and subcontractors, with all applicable environmental, health, safety and security laws and regulations, and performance conditions in the ESMP clauses in the contract. Compliance with such requirements shall represent the minimum standard required of Contractor. Contractor shall be responsible for examining all requirements and determine whether additional or more stringent environmental, health, safety and security provisions are required for the Work. Contractor agrees to utilize protective devices as required by applicable laws, regulations, and any industry or Contractor’s health and safety plans and regulations, and to pay the costs and expenses thereof, and warrants that all such persons shall be fit and qualified to carry out the Work. Indicative Environmental and Social Code of Conduct and clauses for contractors for construction of ACENPEE building is presented in Table 6.5.

Table 6.5: Environmental and Social Code of Conduct and Clauses for Contractors

S/No.	Environmental and Social Issues	Potential Impact	Codes of Conduct
Pre-construction/Construction Phase			
1.	Land Use	<ul style="list-style-type: none"> Construction works may affect cultivated and forested land resulting in a permanent loss of the resources. While the landowner has to part away with his land ownership, the environmental effects can amplify if proper operation and maintenance schedules are overruled. There is however no land acquisition issue on this project. 	Minimize loss of resources. Demarcate RoW to avoid unnecessary encroachment.
2.	Material Use	<p>Excess extraction of local resources, such as wood, sand, soil, boulders, etc.</p> <p>Degradation of forests, erosion and landslide at steep locales due to boulder, stone extraction.</p> <p>Change in river/stream ecosystem due to unchecked sand extraction.</p>	<p>Extract materials only on need basis.</p> <p>Avoid sensitive areas, such as steep slopes and waterways.</p>
3.	Slope Stability	Extraction of forest products and cutting of trees in the steep slopes increases soil erosion/landslide due to loss of soil binding materials.	<p>Extract carefully and secure the top soil within 25 cm from the surface.</p> <p>If down grading exceeds 70, construction of side drainage is necessary.</p>

S/No.	Environmental and Social Issues	Potential Impact	Codes of Conduct
		<p>Wrong alignment can trigger slope failure</p> <p>Haphazard disposal of construction waste can disturb slopes</p> <p>Improper drainage facilities can result in erosion and landslides</p>	<p>Keep optimum balance in extraction and filling of soil works.</p> <p>geo-hazardous assessment and mapping</p> <p>Use designated disposal site and avoid side casting of spoil</p> <p>Provide proper drainage</p> <p>Use bio-engineering on exposed slopes</p>
4.	Wildlife	Wildlife and human conflicts increase as wildlife might destroy the crops or attack the construction worker.	<p>Avoid as much as possible areas with high biodiversity.</p> <p>Efficient movement of machinery and other traffic.</p> <p>Control poaching activities and regulate movement of labor force and their dependents into the forest area to minimize wildlife harassing, trapping and poaching.</p>
5.	Drainage	<p>Higher flow rate of surface water and water logging induce landslides and erosion.</p> <p>Quality of infrastructural works diminishes due to poor drainage such as water logging, immense flow rate of surface water.</p>	<p>It is strongly recommended that the cross-drainage outlets must be channeled to the confirmed natural drains.</p> <p>If horizontal slope exceeds 5%, construction of flow control device necessary every 20m.</p>
6.	Protection of Vegetation	<p>Protected areas and ecosystem Degradation of forest areas.</p> <p>▪ Degradation of agricultural land.</p>	<p>Use minimum and efficient use of wood products for construction.</p> <p>Initiate plantation at damaged and damage prone areas.</p> <p>Increase liability of local forest user groups.</p> <p>Avoid protected areas or densely forested areas</p>
7.	Disposal of Construction Wastes	Dumping of wastes along the road or elsewhere.	<p>Selected spoil dumping sites should be used.</p> <p>After disposal, the area should be leveled and compacted.</p> <p>It is recommended to conserve the soil by planting</p>

S/No.	Environmental and Social Issues	Potential Impact	Codes of Conduct
			indigenous plants including grasses.
8.	Disposal of Sanitary Wastes	Unmanaged sanitary waste disposal creating health problems and public nuisance.	Proper sanitation area needs to be demarked. Check for hygiene of work force.
9.	Impacts on amenities along RoW	Road crossings at water supply, irrigation lines may be disturbed/damaged.	Avoid as much as possible the crossing over such amenities.
10.	Pollution	Dust generation from construction activities, construction vehicular movement increases air pollution. Noise pollution likely from construction machinery operation and vehicular movement. Sanitary problems likely at the construction and workforce quarters.	minimize pollution during construction. Consider enclosure of construction areas from settlement. Enforce speed limit of vehicles
11.	Child abuse including sex and violence	Engaging in child exploitation Workforce engaging in sexual and physical abuse of minors Violence against minors	Ensure that contractors sign the code of conduct. Ensure zero tolerance to any form of child abuse. Monitor the adherence to the code of conduct. Issue stiff penalties to non-adherence.
12.	Violence against vulnerable groups	Sexual and/or physical violence against minors, women and other vulnerable groups	Ensure that contractors sign the code of conduct. Monitor the adherence to the code of conduct. Issue stiff penalties to non-adherence.
13.	Grievance Mechanism	Sub-project activities likely to result in grievances.	Use existing traditional methods to address grievances. Set time-frame for grievance redress and response. Be aware of the University policy on zero tolerance for sexual harassment and sign the code of conduct

S/No.	Environmental and Social Issues	Potential Impact	Codes of Conduct
14.	Communication	Information not properly disseminated. Likelihood of not using appropriate communication channel	<ul style="list-style-type: none"> • Ensure continuous information dissemination on environmental and social risks using appropriate local media (print and electronic). Disseminate information in local languages for wider coverage.
15.	Protection of vulnerable population	Exposure of vulnerable population including women and minors to forms of abuse including exploitation, sex and violence.	Adherence to code of conduct. Integrate CBOs/NGOs in monitoring activities.
17.	Exclusion of local people	Influx of diverse workforce may likely infringe on cultural values and resources. Sub-project activities may affect cultural resources such as trees, shrines, graves etc.	<ul style="list-style-type: none"> • Ensure compliance to native customs. • Ensure workers and contractors obey native customs. • Avoid impacts due to project. • Protection of boundaries from impacts due to construction. Relocation in case impacts are unavoidable.
		Non-consideration of local skills.	Considerations should be given (where possible) to local labour. Certain contracts viz; supply of construction materials e.g. granites, sand, planks etc should be considered for the local people.
18.	Road safety and traffic management	Likely closure and detour. Increase in road accident due to construction activities.	Develop and implement a sound traffic management plan. Liaise with project communities on alternative roads and timing of possible closures and detours. Install safety signage's in appropriate places including the interpretation in local languages. Deploy dedicated staff for road/traffic monitoring.

S/No.	Environmental and Social Issues	Potential Impact	Codes of Conduct
			Install ramp where necessary.
19.	Campaign on STIs including HIV/AIDS	Sexual interactions during project may lead to the transmission of STIs including HIV/AIDS in project communities.	Develop and implement a robust STIs campaign. Embark on sensitization programme targeting youths and other vulnerable groups such as girls and sexually active women, the commercial sex workers– in collaboration with the National HIV/AIDS Coordination Agency (NACA) on protection and treatment.
20.	Overstretching of infrastructure	Workforce migration may exacerbate pressure on available social infrastructure (accommodation, transport etc). Likely upsurge in the prices of goods and services due to population avalanche.	Give adequate employment consideration to local population. Where possible contractors to provide means of transportation to workforce.
Operation Phase			
1.	Encroachment	Unmanaged settlement, construction along the RoW.	Establish RoW properly and enforce its limits.
2.	Interruption of Water Flow along RoW	Concentrated flow left unattended might have severe impact at the downhill alignment of the road.	Cross drain structures, namely pipe culverts, slab culverts, box culverts, need to be maintained. Outlet of these structures would be carrying the concentrated run off flow of the respective catchment, which will be quite high during rainy season, which in turn would require proper planning of drainage systems.
3.	Pollution/Vehicular emission	Dust generation from vehicular movement increases air pollution. Noise pollution likely from vehicular movement.	Enforce speed limit of vehicles. Maintain traffic size movement. Discourage use of horns.

S/No.	Environmental and Social Issues	Potential Impact	Codes of Conduct
4.	Aesthetics	Road construction is likely to increase landscape scars along the road alignment. In addition, if the construction spoils are disposed-off improperly, the ground vegetation would be destroyed which will be visible from a distance.	Such damage cannot be avoided but can be minimized through re-plantation of indigenous species and greenery development.
5.	Increased traffic and vehicular accident	Better road condition would increase vehicular traffic and the rate of accident due to over-speeding.	Install traffic signs and specify speed limits for appropriate places. Construct speed breakers. Where possible, traffic signs would be interpreted in local languages.

6.6. Measures for Non-compliance to the ESMP

If the Contractor was, or is, failing to perform any ESHS obligations and ESHS specified measures in the work under the Contract, the value of this work or obligation, as determined by the Project Manager, may be withheld until the work or obligation has been performed, and/or the cost of rectification or replacement, as determined by the Project Manager, may be withheld until rectification or replacement has been completed. In case of recurrence, the Resident Engineer (supervision) may decide other appropriate measure as contained in the contract including advising the client to call the Performance Security. Failure to perform includes, but is not limited to the following:

- a) failure to comply with any ESHS obligations or work described in the Works' Requirements which may include: working outside site boundaries, excessive dust, failure to keep public roads in a safe usable condition, damage to offsite vegetation, pollution of water courses from oils or sedimentation, contamination of land e.g. from oils, human waste, damage to archeology or cultural heritage features, air pollution as a result of unauthorized and/or inefficient combustion;
- b) failure to regularly review C-ESMP and/or update it in a timely manner to address emerging ESHS issues, or anticipated risks or impacts;
- c) failure to implement the C-ESMP e.g. failure to provide required training or sensitization;
- d) failing to have appropriate consents/permits prior to undertaking Works or related activities;
- e) failure to submit ESHS report/s (as described in ESMP Table 6.1), or failure to submit such reports in a timely manner;
- f) failure to implement remediation as instructed by the Engineer within the specified timeframe (e.g. remediation addressing non-compliance/s).

- g) A written notification from the resident engineer 10 days after the agreed date for the submission of the monthly environmental reports if there is no written explanation submitted by the environmental officer of the contractor.
- h) Failure to submit a declaration of methods for the operations that request it, the Resident Engineer shall immediately suspend activities that are occurring without this approved document.
- i) The contractor shall be financially penalized if his workers at the workplace do not have their personal protective equipment (gloves, jackets, boots, etc.).
- j) The contractors shall be penalized by a written note if they do not comply with the methodology approved for the work. In case of recurrence, the Resident Engineer may decide other appropriate measure as contained in the contract including advising the client to call the Performance Security.

6.7 ESMP COST

The cost of the ESMP for the ACENPEE proposed building is as summarised in Table 6.6.

Table 6.6: Cost of ESMP

S/N	ESMP ACTIVITES	COST (Naira)
1.	Cost of mitigation	5,116,000
2.	Cost of monitoring	789,000
3.	Capacity building	900,000
4.	Disclosure	750,000
5.	Contingency Plan 10%	756,400
	TOTAL	8,320,400
		<i>approximately 18,069.76USD at exchange rate of 1 NGN = 0.0022 USD</i>

Consultant Survey February 2023

6.8 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 concerted consultations with project affected persons and other key stakeholders will ensure that their concerns during project implementation are taken and addressed towards the reduction of the rate of conflicts.

6.8.1 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.

6.8.2 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 potentially during construction especially on Fridays.
- Noise generation
- Dust dispersal
- Poor housekeeping at project site
- Improper behavior by artisans towards members within the university environment.
- Sexual harassment

6.8.3 Redress Mechanism Steps

The general steps of grievance process comprise:

- Registration of complaints.
- Screening/sorting of the grievance
- Determining and implementing the redress action.
- Verifying the redress action.
- Monitoring and Evaluation.
- Achieving of Grievance Resolution Documents

Grievance Dedicated Phone Lines

The Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE), Ahmadu Bello University, Zaria, Nigeria has a zero tolerance for sexual harassment. The Centre's Sexual Harassment Coordinator is Prof. Binta Abdulkarim who is also the university's former Director, Gender Policy Unit.

- A dedicated GRM phone numbers will need to be provided by the SPIU to stakeholders. *These lines are recommended to be toll-free lines).*
- This number will be provided on the project signpost and the complaint box for ease of access of stakeholders
- All complaints received on the phone will be recorded in the grievance logbook
- ACENPEE is to sensitize student, staff and community members on the phone numbers
- The cost of maintaining the phone lines will be borne by the ACENPEE Project

Meetings/Consultations/Focus Group Discussions (FGDs)/Oral reports

- Complaints and suggestions could be received during on-site project progress meetings, focal group discussions, community meetings or other forms of oral receipt etc.
- These complaints from such meetings will be channeled to the GRC and documented
- This will also follow the complaints resolution process

Grievance Redress Committees

- Complaints/suggestions can be received through Grievance Redress Committees (GRCs)
- GRCs will be set up at the project level, the Management level and the governing council

- Members of the communities would be sensitized on the GRM use, process and procedure.
- Stakeholders can channel their concerns through any member of the GRC, who will in-turn inform the committee for proper recording and subsequent action

6.8.4. Processing and Resolution of Grievances

The grievances from the stakeholders or their representatives may be communicated through the designated channels (complaints boxes, designated phone numbers, online complaint forms, direct complaints lodged with any member, complaints raised at progress review meetings/FGDs/public consultations etc., anonymous complaints amongst others). All grievances communicated in any of these mediums will be recognized and recorded by the GRCs as and when it is expressed.

Grievance Logbook/Database

All project related grievances will be logged in the grievance logbook/database (Table 6.7).

- The grievance logbook will be maintained by the GRCs at the project level
- This will be used to record grievances and how they are resolved
- The project will provide the logbook for the project GRC
- The logbook will be kept by the GRC secretary/GRM officer at each level
- A separate GRM log would be available for recording GBV related issues. The log will contain minimum information and be manned by the Guidance Counsellor at the project level and kept in a confidential manner.

Table 6.7: Logbook Format

S/N	Date & Time	Grievance No.	Name of Complainant	Department/ Designation	Name of Recording Officer	Medium of Communication	Details of Grievance	Action Taken and Date	Status*	Remarks**
1.										
2.										

* **Status** – Open/Closed/Referred

****Remarks** – provide a summary feedback and any strategy the project has put in place to prevent re-occurrence of such complaint

The principal steps in grievance processing and resolution are stated in Table 6.8 and GRM flow chart in Figure 6.1.

Table 6.8: Steps in Handling Grievances

N	Steps	Responsibility	Timeline
1	Receipt of the grievance and acknowledgement to the complainant	Environmental and Safeguard Officer (ESO)	1 day
2	Entry of the complaint into the grievance	ESO	1 day

	database/ logbook		
3	Preliminary assessment of grievance to ascertain whether it is project related. Where it is not project-related, the complainant should be duly informed and advised on the appropriate authority to report to. This is updated in the logbook and closed	ESO	2 days
4	Convene project level committee meeting to investigate the grievance	Centre Coordinator/ ESO	2 days
5	Agree on a resolution strategy, timeline, costs in conjunction with all parties involved	Complainant/ GRC/Accused	2 – 5 days
6	Response letter and register in the database/logbook if the solution is accepted, resolution (including any payments) and close the case. Monitor implementation of resolution	ACENPEE Environmental and Social safeguard team	1 - 2 weeks
7	If the resolution is not accepted by any/both parties, it is referred to the Higher-Level Committee for resolution	Centre Coordinator/ Vice Chancellor/ Governing Council	2-4 weeks after registration of grievance
8	Resort to judicial measures	State Judiciary	At any stage in the process though complainant would be persuaded to exercise patience until thorough utilization of this mediation path

- *Where grievances remain unresolved, the complainant is advised of their right to seek judicial redress.*
- *In this instance, the Centre coordinator will inform the World Bank officially including all steps taken to resolve the issue*

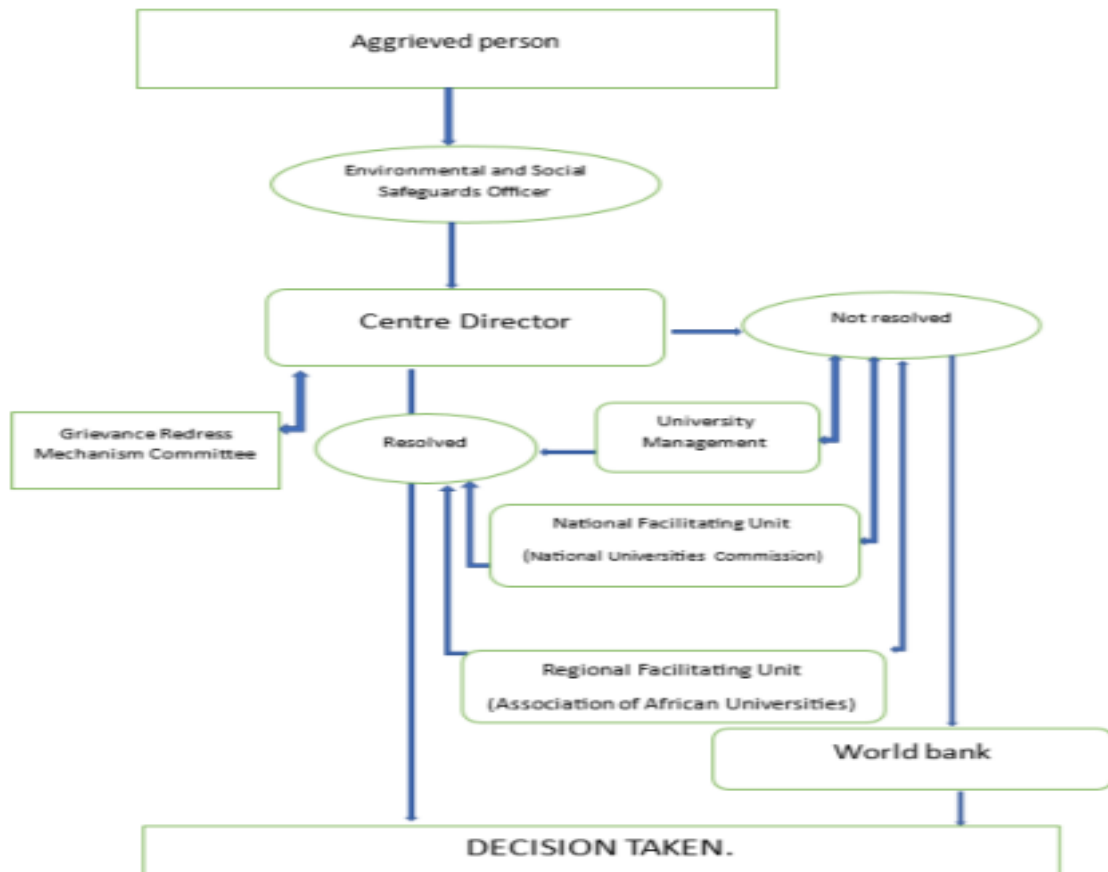


Figure 6.1: Grievance Redress Mechanism Flow Chart Of ACENPEE

6.9. 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.

6.9.1 In-Country Disclosure Process.

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 as part of the tender documents for contractors to bid in tendering process which will be published in a national newspaper.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

Generally, the study has indicated that the proposed project will not severely impact negatively on the existing environmental, social and health as well as safe conditions of the people, locally.

- There was no identification of cultural and heritage sites that may be affected by the proposed development
- Appropriate use of green hedges is existing around project sites so that the project site is not visually intrusive from public road.

7.2 Recommendations

From the foregoing, the recommendations include the following:

- Academic Community members should be sensitized and duly informed on the time and duration of works through consultations;
- Construction works should be carried out in an environmentally sustainable and socially responsible and inclusive manner;
- Potential environmental and social impacts of sufficient magnitude that could interrupt the execution of the project were not detected. Although, there were few negative environmental and social impacts that may potentially occur due to the activities associated with the proposed works at operational phase but adequate mitigation measures have been provided to address them;
- The proposed intervention work is most desirable because of the obvious environmental, health and socio-economic benefits. These far out-weigh the negative environmental and social impacts that could arise in the course of implementation;
- Appropriate institutional framework has been drawn up to implement the mitigation measures and environmental management plan including the proposed monitoring programmes.
- The project would influence the social and economic conditions of people and communities for commercial business. It is a long-term venture to create spinoff companies/ start-up digital engineering companies such that when the students eventually graduate, they would be able to stand on their own without looking for any job.
- The long-term beneficial impacts include improved learning experience for students in the campus, improved job opportunities in the Engineering Sector and the growth potential for technological development in Nigeria.

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ANNEXES

Annex 1 Result of water and soil analysis

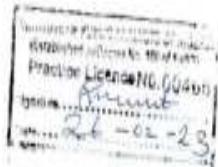
Physicochemical and Microbiological Analysis Results of treated Water Sample.

Parameters	Treated water sample	WHO Maximum permitted level
General appearance	Clear	Clear
Temperature (°C)	24	-
Odour	Odourless	Odourless
pH	7.2	6.50-8.5
Conductivity (us/cm)	153.7	1000
Turbidity (NTU)	0	5
Total suspended solids (mg/l)	0	-
Total dissolved solids (mg/l)	70.8	500
Total solids (mg/l)	70.8	-
Calcium hardness (mg/l)	11	50
Magnesium hardness (mg/l)	8	50
Total hardness (mg/l)	19	100
Phenolic compounds (mg/l)	0	-
Total alkalinity (mg/l)	3	50
Sulphate (mg/l)	2	500
Chloride (mg/l)	5	250
Cyanide (mg/l)	0	-
Nitrate (mg/l)	1	50
Nitrite (mg/l)	0	0
Sulphide (mg/l)	0	0
Copper (mg/l)	0.01	1.5
Zinc (mg/l)	0.8	3
Manganese (mg/l)	0.01	0.5
Nickel (mg/l)	0	0.02
Iron (mg/l)	0.03	0.03
Lead (mg/l)	0	0.01
Chromium (mg/l)	0	0.05
Cadmium (mg/l)	0	0.01
Residual chlorine (mg/l)	0	1
Phosphate (mg/l)	0	0.03
Coliform (cfu/100ml)	0	0
E.coli (cfu/ml)	0	0
Total plate bacteria count (cfu/ml)	0	100

Dr Saminu Murtala Yakasai.

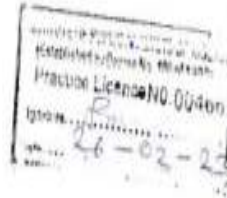
Name of Public analyst

Saminu



Dr. Saminu Murtala Yakasai.

Name of Public Analyst



Chemical Properties of Soil sampled

Parameter	Soil sample	NESREA 'S Limit
pH	6.1	
Conductivity (us/cm)	282	
Organic matter (%)	0.5	
Calcium (mg/kg)	45	
Magnesium (mg/kg)	29	
Phosphorous (mg/kg)	7	
Nitrate (mg/kg)	22	
Chloride (mg/kg)	49	
Potassium (mg/l)	11	
Oil and grease (mg/kg)	1.3	
Iron (mg/kg)	2.8	
Lead (mg/kg)	0.7	164
Copper (mg/kg)	1.5	100
Nickel (mg/kg)	0.9	70
Zinc (mg/l)	2.1	421
Cadmium (mg/kg)	0.07	3
Chromium (mg/kg)	0.08	100
Coliform (cfu/100ml)	182	

ANNEX 2:

TERMS OF REFERENCE TO ENGAGE A CONSULTANT TO PREPARE AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR THE CONSTRUCTION OF AFRICA CENTRE OF EXCELLENCE ON NEW PEDAGOGIES IN ENGINEERING EDUCATION (ACENPEE), AHMADU BELLO UNIVERSITY, ZARIA

A. INTRODUCTION & BACKGROUND

The Africa Higher Education Centres of Excellence (ACE) Project is a World Bank initiative in collaboration with governments of participating countries to support Higher Education institutions in specializing in Science, Technology, Engineering and Mathematics (STEM), Environment, Agriculture, applied Social Science / Education and Health. It is the first World Bank project aimed at the capacity building of higher education institutions in Africa.

The first phase (ACE I) was launched in 2014 with 22 Centres of Excellence in nine (9) West and Central African countries; Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, Ghana, Nigeria, Senegal and Togo. The Project aims to promote regional specialization among participating universities in areas that address specific common regional development challenges. It also aims to strengthen the capacities of these universities to deliver high quality training and applied research as well as meet the demand for skills required for Africa's development. The second phase (ACE II) was launched in East and Southern Africa with 24 Centres across Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda and Zambia.

Based on the initial successes, the World Bank and the French Development Agency (AFD) in collaboration with the African governments, launched the ACE Impact Project in 2018 to strengthen post-graduate training and applied research in existing fields and support new fields that are essential for Africa's economic growth. There are 53 ACEs from 12 African countries whose thematic areas include sustainable cities; sustainable power and energy; social sciences and education; transport; population health and policy; herbal medicine development and regulatory sciences; public health; applied informatics and communication; and pastoral production.

In Nigeria, The Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE) at Ahmadu Bello University, Zaria was selected as part of the new ACE Impact Centres. Part of the projects of the Centre is the construction of a new building to house the ACENPEE-ACE Centre. This will have significant environmental and social impacts on the immediate surrounding (Ahmadu Bello University main campus). Therefore, to ensure all impacts are identified and mitigation

measures as well as responsibilities for implementing these measures are in place, an Environmental and Social Management Plan (ESMP) is required. The ESMP will also include recommendations on good work practices considering the COVID-19 situation which, requires physical/social distancing, good hygiene practices and consultations where required. It will ensure that the ACENPEE-ACE project is in compliance with the World Bank Safeguard Policies particularly OP 4.01 Environmental Assessment and OP 4.11 Physical Cultural Resources both triggered for the ACE II Project. The ESMP will also ensure the project complies with the Nigeria EIA Act CAP. E12 L.F.N. 2004.

B. PRESENTATION OF THE PROMOTER

The African Centre of excellence on New Pedagogies in Engineering Education is the promoter of this project. The mandate of the Centre is to improve the quality of postgraduate training in the African sub-region through enhancement of curriculum review and development, development of new teaching methodologies so as to produce high-quality professionals that can impact higher order skills, entrepreneurial spirit, and research capacity within the engineering disciplines and technology. The Centre aims at sharpening the pedagogical knowledge and skills of students in curriculum and course design, learning theories in engineering, use of multimedia technology and practical micro teaching. The knowledge and skills in new pedagogies is expected to supplement the traditional lecture method in educating the engineers of the present and future.

C. RATIONALE FOR THE STUDY

The proposed project will involve construction of a new building to accommodate the ACENPEE-ACE Centre. Activities associated with the project such as, foundation laying, cement works, burrow pits, digging/excavation, de-vegetation, waste generation etc, will pose negative environmental and social risks/impacts due to the nature of works. Some of the potential negative impacts that would arise during the construction works will include: generation of hazardous, non-hazardous waste and medical wastes, noise/air pollution, accident from movement of equipment and materials to site, occupational health & safety risks, risks associated with labour influx (security threat, gender based violence (GBV) in particular Sexual Exploitation and Abuse due to labour influx, increase in STIs/STDs), grievance and disturbance to physical and cultural resources among others. All these triggers the World Bank's Environmental and Social Standards ESS1 (Assessment and Management of Environmental and Social Risks and Impacts), ESS 2 (Labour and Working

Conditions) and ESS6 (Biodiversity Conservation and Sustainable Management of Living resources). In addition, the Nigeria EIA Act mandates that any construction that would have significant impact on the environment must be subjected to an environmental assessment prior to commencement of the civil works.

Hence, in meeting the requirements of the World Bank Safeguard Policies and the Nigeria EIA Act CAP. E12 L.F.N. 2004, the project proposes to engage an experienced consultant who would conduct an Environmental and Social Management Plan (ESMP) to identify the environmental and social impacts associated with this project as well as to proffer mitigation measures to address potential negative impacts.

D. OBJECTIVES OF THE CONSULTANCY

Based on the requirement of the World Bank ESS and the Nigeria EIA Act CAP. E12 L.F.N. 2004, there is the need to carry out an ESMP for the proposed ACENPEE projects. The objective of the study is to prepare an Environmental and Social Management Plan (ESMP) for the proposed construction of the Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE). The ESMP will provide an overview of the environmental and social baseline conditions of the proposed sub-project, summarize the potential impacts associated with the proposed demolition/construction works, and set out the management measures required to mitigate potential adverse impacts in a series of sector specific Environmental Management Plans (ESMPs).

The ESMP will be utilized by the contractor(s) to be commissioned by ACE Impact Centre (ACENPEE) in the preparation of the required Contractor's ESMP (C-ESMP), which will form the basis of the site-specific management plan prior to works commencing.

The ESMP will be used by the contractor to address all Occupational Health and Safety (OHS) issues and community health and safety issues associated with the proposed construction work.

As the proponent for the sub-projects, it is our objective to avoid, where practical, unacceptable adverse environmental, OHS, social and/or economic impacts.

The ESMP will achieve the following objectives:

- Provide a detailed description of the main phases of the works (preparation, execution/construction, operation) and key activities of the works to be executed;

- Conduct public consultations with all the stakeholders of the Project in order to collect their suggestions that will be integrated in the ESMP;
- Carry out an analysis of the initial environmental status of the sites concerned and describe the biophysical, socio-economic and cultural characteristics of the environment in which the sub-project activities will take place,
- Highlight the major constraints that need to be taken into account at the time of site preparation, construction and during the construction and installation of equipment and during the operation phase;
- Identify the environmental and social components that may be impacted by the implementation of the works
- Check to ensure that the design and construction methods and the various components of the works are consistent with the ecological, social, economic and cultural realities of the project areas and, if necessary, propose any necessary readjustments;
- Analyse the legal and regulatory framework for environmental management in relation to national legislation and World Bank safeguard policies;
- Identify and analyse, by implementation phase, the potential social and environmental impacts, both positive and negative (including impacts on physical cultural resources) that may result from the realisation of the rehabilitation, renovation or construction works of the infrastructures
- Assess the significance of these impacts during the project phases, compared to the no-project scenario;
- Propose measures to optimise the positive impacts during the different phases of the works and technically viable and economically feasible mitigation measures to avoid, minimise, mitigate or compensate for the negative environmental and social impacts so as to bring them to acceptable levels; on the environment and the human environment;
- Present the costs of implementing the proposed mitigation measures;
- Assess the need for solid and liquid waste collection, disposal and infrastructure management, and make recommendations;
- Propose a mechanism for managing complaints that may arise in the course of the works.
- Potentially screen out environmentally unsound activities
- Proposes modified designs to reduce environmental and social impacts
- Identify feasible alternatives
- Predicts significant adverse impacts
- Identifies mitigation measures to reduce, offset, or eliminate adverse impacts
- Engages and informs potentially affected communities and individuals
- Influences decision-making and the development of terms and conditions

E. DESCRIPTION OF THE PROPOSED SUB-PROJECT ACTIVITIES

The Centre currently operates from a temporary office accommodation provided by the university. The Centre, however, has a window in the Disbursement Linked Indicators (DLI 4.3) of the project to design and build a permanent structure to house the Centre's operations. To achieve this, the University has been written to allocate a space for the construction of the permanent Centre building of the ACENPEE in the phase II development area of the University

In the construction of the Centre building, the proposed activities will involve construction of a new building and associated structures and works such as plumbing, electrical fittings, soak away, roofing etc to accommodate the ACENPEE building. The construction will be implemented on land belonging to Ahmadu Bello University Zaria, hence, it is expected that there will be no involuntary resettlement, acquisition of land, relocation, compensation, loss of physical and economic assets, and/or loss of livelihoods.

The Centre have obtained a beautiful architectural design with the best of modern facilities that meets international standards. The design incorporates provision for people with disability (ramps) and other features as highlighted below:

- One story building (Ground and upper floor)
- Building that has a beautiful approach (Face)
- Entrance foyer
- Reception desk area
- Visitors waiting area
- Centre Leader's office ensuite with attached secretary's office ensuite (with enough space to accommodate conference table for 10 people.
- Deputy Centre Leader's office ensuite with space for mini conference table for 5 people
- 10 ensuite offices (each with toilet facilities)
- Techno - pedagogy laboratory
- ICT/Computer laboratory
- Conference room for 30 persons (with video conferencing facilities)
- 2 class rooms (50-seater each with modern teaching facilities)
- 2 meeting rooms for 20 persons each (with modern facilities)
- Store room (with shelves)

- General toilets - 3 male, 3 females (urinary, cubicles and modern facilities)
- Gate house
- Generator house
- Car park
- Beautiful landscaping

E. SCOPE OF WORK

The Consultant will work in close collaboration with the engineering design consultants and the project team. The consultant will have to consider the technical variants of the proposed activities and in return, inform the technical design consultants of any major constraint or recommendation that may arise due to the social and environmental situation on ground.

The Consultant will consider the proposed civil, electrical and refrigeration engineering designs, remodeling, landscaping, drainage construction, alternative power sources provision and other activities that would be carried out within the project location. The consultant will assess natural resources and infrastructure potentially affected during project implementation and operation and select the management strategies needed to ensure that environmental and social risks/impacts are appropriately mitigated.

F. METHODOLOGICAL APPROACH TO CONDUCT THE STUDY

The consultant is requested to describe precisely and clearly each of the methods and tools he will use for both data collection and data processing. He will examine the interactions between the project's nuisance emitters and the environmental receptors subject to the corresponding interference, while excluding those aspects which have little or no relevance to the environmental impacts of the proposed action. It will identify those elements of the biophysical and social environment which may be affected by the project and for which there is public and/or professional concern. It will identify all the potential environmental impacts of the project and assess them using an appropriate methodology to rank them in order of importance. Only significant impacts will be examined in depth. The Consultant will then propose realistic and feasible mitigation or enhancement measures and a monitoring program for these.

A particular attention will be paid to sensitising the population in the project area and the drivers of construction machines and vehicles on environmental protection and safety aspects. The Consultant will assess the risks associated with the project and propose measures to be taken in case of emergency. The Consultant will propose responses to the environmental feasibility of the project.

The Consultant is advised to use the Participatory Research Method (PRM) for the collection of environmental information.

The study will also propose, among others, the following

- a waste management plan for the project's activities
- a gender and vulnerability assessment plan
- a Grievance Redress Mechanism.

The study will be conducted in compliance with the environmental impact assessment procedures developed by the country. It should also take into account the World Bank's ESS triggered by the project.

The methodology adopted by the consultant will be rigorous and will involve a study of the initial state, the identification of potential impacts, the evaluation of relevant impacts and the identification of insertion measures.

Therefore, the consultant will cover by all means (vehicles and/or feet) the whole area of influence of the project previously well defined in agreement with the Promoter

Tasks of the Consultant include the following:

The core tasks of the consultant shall include

- Prepare a complete ESMP
- Provide a baseline description of the characteristics of the environment in which the activities of the sub-project will take place.
- Highlight the major constraints that need to be taken into account when preparing the land, construction and during operation.
- Conduct a detailed risk analysis.
- Evaluate the potential environmental and social impacts due to sub-project activities.
 - Determine the significance of positive and negative impacts, direct and indirect impacts and immediate and long-term impacts associated with the sub-project
 - Identify risk mitigation measures.
 - Consider the potential impacts of a project on physical cultural resources and follow the required procedures.
- Analyze alternative options.
- Identify work supervision mechanisms
- Define the framework of information, consultation and public participation.
- Present institutional arrangements for implementation of the ESMP as well as reporting systems
- Describe the arrangements for handling complaints and resolving potential conflicts
- Consultations: The Consultant should carry out consultations with identified primary and secondary stakeholders in order to obtain their views about the sub-project/project.

These consultations shall occur during the preparation of the ESMP to identify key environmental and social issues and impacts, and after completion of the draft ESMP to obtain comments from stakeholders on the proposed mitigation/enhancement measures.

***Ethical requirements**

- Before undertaking any activity, the Consultant will ensure that S/He understands all ethical considerations related to gender-based violence (GBV) (in particular Sexual Exploitation and Abuse [SEA]). The consultant should not collect any primary data and should NOT conduct interviews or research using the SEA survivors and will only make use of secondary sources and data. The objective of this is to minimize harm to women and children.

G. REPORTS AND ESMP STRUCTURE

The ESMP Report shall be presented in a concise format and should contain all studies, processes, analyses, tests and recommendations for the proposed intervention. The report shall focus on the findings, conclusions and any recommended actions, supported by summaries of the data collected and citations for any references used.

The ESMP report will include the following Chapters and Sections:

Preliminary pages

Cover page

Table of contents

List of acronyms and their definitions

Executive Summary

Chapter 1: Introduction

- Introduction to the ACE Project and Description of the proposed construction activities
- Rationale for ESMP
- Methodology

Chapter 2: Project Description

- Project Activities and Schedules including expected duration of the construction works

Chapter 3: Biophysical and Socio-Economic Characteristics of Project Area

- Relevant Maps and engineering designs for proposed construction activities.

- Description of the area of influence and environmental and social baseline conditions

Chapter 4: Assessment of Potential Adverse Environmental and Social Impacts.

- Methods and techniques used in assessing and analyzing the environmental and social impacts of the proposed construction.

Chapter 5: Consultation with Stakeholders

- This chapter shall summarize the actions undertaken to consult the groups affected by the construction. The detailed record of the consultation meetings shall be presented in annex to the ESMP.

- Discussion of the positive and negative potentially significant environmental and social impacts of the proposed construction.

Chapter 6: Environmental and Social Management Plan (ESMP)

- ESMP Table highlighting Activities, identified adverse impacts, mitigation measures and corresponding Indicator(s), Mode of Measurement, corresponding Cost of Mitigation, monitoring indicators, Frequency, Monitoring Cost, as well as responsibilities for implementing these measures
 - Institutional responsibilities for monitoring and implementation of mitigation;
- Capacity Building
- Monitoring and Reporting
- Implementation Schedule
- Contractual Measures
- Measures for Non-Compliance with the ESMP
- Cost Estimates for ESMP Implementation
- Grievance Redress Mechanism (GRM)

Chapter 7: Conclusion and Recommendations

Annexes

Annex 1: References

Annex 2: Terms of Reference

Annex 3: List of Persons Met in consultations and summaries of meetings

Annex 4: Summary of World Bank Safeguard Policies

Annex 5: General Environmental Management Conditions for Constructions/Civil Works.

Annex 6: Project Occupational Health and Safety (OHS) Plan

Annex 7: Company Code of Conduct on Preventing Gender Based Violence and Violence Against Children

Annex 8: Manager's Code of Conduct on Preventing Gender Based Violence and Violence against Children

Annex 9: Individual Code of Conduct on Preventing Gender Based Violence and Violence against Children

Annex 10: Waste Management Plan

Annex 11: Workers Campsite Management Plan

Annex 12: Safeguard Guidance on Covid-19 Consideration In Construction/Civil Works Projects

(d) Training (when appropriate),

H. DATA, LOCAL SERVICES, PERSONNEL, AND FACILITIES TO BE PROVIDED BY THE PROCURING ENTITY.]

The ACE Impact Centre (ACENPEE) shall provide to the consultant all relevant/supportive environmental reports/documents previously carried out. Land survey report and the interpretation, soil suitability test and meteorological reports would amongst others be inclusive.

I. REQUIRED QUALIFICATION AND EXPERIENCE

Consultant's Experience

The working language of the for the preparation of the ESMP will be English, in addition the consultant should have:

- University degree at the Master's level (or equivalent), specialization in environmental sciences or geography or agronomy or development studies or affiliated disciplines.
- At least 5 years of experience in practical safeguards, and in conducting environmental studies or environmental assessment of projects or implementing environmental initiatives. Excellent analytical, communication and writing skills.
- It is highly desirable that the consultant have experience with working with international development institutions like the World Bank, and on infrastructure related projects.

Annex 3: List of Persons Met in consultations and summaries of meetings

S/N	Names	Faculty/Department	Phone Number
1	Prof. Raymond B. Bako	Centre Director ACENPEE	08037037436
2	Prof. Fatai O. Anafi	M&E Officer ACENPEE	08035899886
3	Prof. Fatima B. Ibrahim	E&S Officer ACENPEE	08023327728
4	Prof. Adrian O. Eberemu	A&R Officer ACENPEE	08035447149
5	Mr. Yusuf Owoseni	WREEN ABU	07067892326
6	Abdullahi Abdulkarim	Education Islamic Studies	09130353883
7	Ogenyi Aaron	Life Science/Microbiology	08052462500
8	Cynthia Odili	Water Resources and Environmental Engineering	08129525246
9	Juliana Iji	Water Resources and Environmental Engineering	08066373328
10	Auwal Muhammad Yola	Environmental Design/Building	08141651706
11	Salyiu Attah	Business School/Economics	08075904565
12	Adekunle Abdulroqeeb Oladimeji	Engineering	07012828312
13	Abdulmuni Nasir	Chemical Engineering	08032909377
14	Amaya J. Habila	Life Science Department of Biochemistry	08039684207
15	Adams	Pharmacy	08105047391
16	Suleiman Salihu Garba	Veterinary Medical	07051084988
17	Isah Idris	Education	09069961600
18	Hassan Balarabe	Human Anatomy	09031916914
19	Habibu Abubakar	Human Anatomy	09032889243
20	Muhammad Auwal	Human Anatomy	08148356852
21	Ahmad Abdullahi	Human Anatomy	08067494845
22	Abubakar Zubairu	MBBS	07044501517
23	Usman Kabiru	Education	07068867765
24	Abdulrahaman Jaafar	MBBS	09067791141
25	Ahmed Abdullahi	Basic Clinical Science/MBBS	09027745173
26	Jamiu Issa	Medicine	08039939643
27	Umar Aminu Adamu	Medicine	08130039698
28	Fatima Usman	Security Unit	08063215232
29	Mrs Blessing Yakubu	Bassa Kawa	08109975109
30	Gouegni E. Flore	Department of Biochemistry	08067278920
31	Abdulgafar Agboola	Business School /Insurance and Actuarial Science	0903411746
32	Wakili Sedi	Electrical Engineering	08034852416
33	Terseer Abraham Suyhnen	Business School /Accounting	07011428727
34	Rimamfenten Godwin Tanko	Business/Accounting	08140736481
35	Abdullahi Abdulkarim	Education Islamic Studies	09130353883

Annex 4: Summary of World Bank Safeguard Policies

Summary of World Bank policies and Potential triggers for the ACENPEE project.

No.	World Bank Safeguard Policy	Summary of core requirement	Potential Trigger under proposed project	Remarks
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 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.	Triggered because the project activities such as site clearing and excavation will impact the air, water, and land.	<p>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.</p> <p>2. Develop the ESMP and implement all measures set out in the plan, conduct monitoring and reporting on performance of the plan</p>
2	OP 4.11: Physical cultural Resources	Investigate the inventories cultural resources potentially affected. Include mitigation measures when there are adverse impacts on physical cultural resources or avoid if possible	Triggered because the project will involve major excavations, earthworks, and environmental modifications.	<p>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.</p> <p>2. Develop the ESMP and Implement all measures set out in the plan, conduct monitoring and reporting on performance of the plan.</p>

Annex 5: General Environmental Management Conditions for Constructions/Civil Works.

1. In addition to these general conditions, the Contractor shall comply with any specific Environmental Management Plan (EMP) or Environmental and Social Management Plan (ESMP) for the works he is responsible for. The Contractor shall inform himself about such an ESMP, and prepare his work strategy and plan to fully take into account relevant provisions of that EMP. If the Contractor fails to implement the approved ESMP after written instruction by the Project Implementation Unit (PIU) to fulfill his obligation within the requested time, the ACE reserves the right to arrange through the PIU for execution of the missing action by a third party on account of the Contractor.

2. Notwithstanding the Contractor's obligation under the above clause, the Contractor shall implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in an ESMP. In general, these measures shall include but not be limited to:

(a) Minimize the effect of dust on the surrounding environment resulting from earth mixing sites, asphalt mixing sites, dispersing coal ashes, vibrating equipment, temporary access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of dust producing activities.

(b) Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.

(c) Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels is maintained and/or re-established where they are disrupted due to works being carried out.

(d) Prevent bitumen, oils, lubricants and waste water used or produced during the execution of works from entering into rivers, streams, irrigation channels and other natural water bodies/reservoirs, and also ensure that stagnant water in uncovered borrow pits is treated in the best way to avoid creating possible breeding grounds for mosquitoes.

(e) Prevent and minimize the impacts of quarrying, earth borrowing, piling and building of temporary construction camps and access roads on the biophysical environment including protected areas and arable lands; local communities and their settlements. In as much as possible restore/rehabilitate all sites to acceptable standards.

(f) Upon discovery of ancient heritage, relics or anything that might or believed to be of archaeological or historical importance during the execution of works, immediately report such findings to the SE so that the appropriate authorities may be expeditiously contacted for fulfillment of the measures aimed at protecting such historical or archaeological resources.

(g) Discourage construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities.

(h) Implement soil erosion control measures in order to avoid surface run off and prevents siltation, etc.

(i) Ensure that garbage, sanitation and drinking water facilities are managed properly in construction areas.

(j) Ensure that, in as much as possible, local materials are used to avoid importation of foreign material and long distance transportation.

(k) Ensure public safety, and meet traffic safety requirements for the operation of work to avoid accidents.

3. The Contractor shall indicate the period within which he/she shall maintain status on site after completion of civil works to ensure that significant adverse impacts arising from such works have been appropriately addressed.

4. The Contractor shall adhere to the proposed activity implementation schedule and the monitoring plan / strategy to ensure effective feedback of monitoring information to project management so that impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.

5. Besides the regular inspection of the sites by the PIU for adherence to the contract conditions and specifications, the on a need basis the PIU shall appoint an Inspector to oversee the compliance with

these environmental conditions and any proposed mitigation measures. State environmental authorities may carry out similar inspection duties. In all cases, as directed by the PIU, the Contractor shall comply with directives from such inspectors to implement measures required to ensure the adequacy of rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.

Material Excavation and Deposit

6. The Contractor shall obtain appropriate licenses/permits from relevant authorities to operate quarries or borrow areas.
7. The location of quarries and borrow areas shall be subject to approval by relevant local and national authorities, including traditional authorities if the land on which the quarry or borrow areas fall in traditional land.
8. New extraction sites:
 - a) Shall not be located in the vicinity of settlement areas, cultural sites, wetlands or any other valued ecosystem component, or on high or steep ground or in areas of high scenic value, and shall not be located less than 1km from such areas.
 - b) Shall not be located adjacent to stream channels wherever possible to avoid siltation of river channels. Where they are located near water sources, borrow pits and perimeter drains shall surround quarry sites.
 - c) Shall not be located in archaeological areas. Excavations in the vicinity of such areas shall proceed with great care and shall be done in the presence of government authorities having a mandate for their protection.
 - d) Shall not be located in forest reserves. However, where there are no other alternatives, permission shall be obtained from the appropriate authorities and an environmental impact study shall be conducted.
 - e) Shall be easily rehabilitated. Areas with minimal vegetation cover such as flat and bare ground, or areas covered with grass only or covered with shrubs less than 1.5m in height, are preferred.
 - f) Shall have clearly demarcated and marked boundaries to minimize vegetation clearing.
9. Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.
10. Stockpile areas shall be located in areas where trees can act as buffers to prevent dust pollution. Perimeter drains shall be built around stockpile areas. Sediment and other pollutant traps shall be located at drainage exits from workings.
11. The Contractor shall deposit any excess material in accordance with the principles of these general conditions, and any applicable EMP, in areas approved by local authorities and/or the PIU.
12. Areas for depositing hazardous materials such as contaminated liquid and solid materials shall be approved by the PIU and appropriate local and/or national authorities before the commencement of work. Use of existing, approved sites shall be preferred over the establishment of new sites.

Rehabilitation and Soil Erosion Prevention

13. To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.
14. Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.
15. Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2m high are recommended.
16. Re-vegetate stockpiles to protect the soil from erosion, discourage weeds and maintain an active population of beneficial soil micro-organisms.
17. Locate stockpiles where they will not be disturbed by future construction activities.
18. To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired.
19. Remove toxic materials and dispose of them in designated sites. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute groundwater and soil.
20. Identify potentially toxic overburden and screen with suitable material to prevent mobilization of toxins.

21. Ensure reshaped land is formed so as to be inherently stable, adequately drained and suitable for the desired long-term land use, and allow natural regeneration of vegetation.
22. Minimize the long-term visual impact by creating landforms that are compatible with the adjacent landscape.
23. Minimize erosion by wind and water both during and after the process of reinstatement.
24. Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.
25. Revegetate with plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem. The choice of plant species for rehabilitation shall be done in consultation with local research institutions, forest department and the local people.

Water Resources Management

26. The Contractor shall at all costs avoid conflicting with water demands of local communities.
27. Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the relevant Water Authority.
28. Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.
29. Temporary damming of streams and rivers shall be done in such a way avoids disrupting water supplies to communities downstream, and maintains the ecological balance of the river system.
30. No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.
31. Wash water from washing out of equipment shall not be discharged into water courses or road drains.
32. Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.

Traffic Management

33. Location of access roads/detours shall be done in consultation with the local community especially in important or sensitive environments. Access roads shall not traverse wetland areas.
34. Upon the completion of civil works, all access roads shall be ripped and rehabilitated.
35. Access roads shall be sprinkled with sufficient water at least five times a day in settled areas, and three times in unsettled areas, to suppress dust emissions.

Blasting

36. Blasting activities shall not take place less than 2km from settlement areas, cultural sites, or wetlands without the permission of the PIU.
37. Blasting activities shall be done during working hours, and local communities shall be consulted on the proposed blasting times.
38. Noise levels reaching the communities from blasting activities shall not exceed 90 decibels.

Health and Safety

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

Repair of Private Property

42. Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the PIU, a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.
43. In cases where compensation for inconveniences, damage of crops etc. are claimed by the owner, the ACE has to be informed by the Contractor through the PIU.

Annex 6: Project Occupational Health and Safety (OHS) Plan

The management of OHS must be in accordance with the general principles, which should be applied to control workplace hazards in order to:

- eliminate the risks;
- assess the risks, which cannot be avoided;
- reduce the risk at source;
- give priority to collective protective measures over individual protective measures;
- adapt the work to the individual, especially with regard to the design of workplaces and the choice of work equipment and production methods;
- adapt working methods to technical progress;
- develop a coherent overall prevention policy, which covers technology and work organization and
- give appropriate instructions to employees.

The application of prevention and control measures to be taken against occupational hazards should be based on job safety and its hazard analyses. The risk assessment of jobs should be evaluated, and related protection/prevention actions should be designed. In order to identify priorities, risk ranking table should be used as given in Table 1.

Table 1. Risk Ranking to Classify Worker Scenarios

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Low risk	Moderate risk	Extreme risk	Extreme risk	Extreme risk
Likely	Low risk	Moderate risk	High risk	Extreme risk	Extreme risk
Moderate	Low risk	Moderate risk	High risk	Extreme risk	Extreme risk
Unlikely	Low risk	Low risk	Moderate risk	High risk	Extreme risk
Rare	Low risk	Low risk	Moderate risk	High risk	High risk

Above-mentioned rankings in Table 1 help to define potential consequences of exposure to a hazard. Low risk can be managed by routine procedures. In order to manage moderate risk class, management responsibilities should be specified. The jobs with high risk classification require senior management attention. Extreme risks require immediate actions and it should be avoided as much as possible.

The Project operations and facility itself should be designed according to reduction of high-risk classifications and protection of employees. Training and drills to practice the procedures and plans should be undertaken periodically to minimize the risks of occupational hazards.

In this Occupational Health and Safety Management Plan, management approaches of physical, chemical, biological and radiological hazards are defined. The mitigation measures are not limited with the ones mentioned in this plan. During the operational phase, the Project operations may require

additional actions to be taken. The risk assessment should be undertaken periodically, site-specific occupational hazards should be identified, and related actions should be defined and undertaken.

It will be ensured that all the personnel (including contractors) are aware of their responsibilities, risks of their jobs and precautions to be taken on the workplace. Related training with communication codes for any occupational hazard and personal protective equipment will be provided to all personnel by the Project.

OHS Management Approaches

OHSMP provides implementing programs that contribute to mitigation of health and safety risks that may arise as a direct or indirect result of the Project. By implementing the measures provided in this Plan, it is aimed to mitigate the potential risks that arises from the work during construction and operation phases of the design studio Project. Following issues are specified in the main approach of this OHSMP:

- Identifying and controlling occupational hazards and eliminating OHS risks,
- Ensuring that all necessary actions which are suggested in laws, regulations, standards and guidelines are taken to prevent any OHS incident,
- Ensuring third parties such as contractors, subcontractors, visitors and suppliers understand and comply with site safety rules,
- Ensuring safe procurement and proper use of hazardous materials,
- Raising OHS awareness of all employees and third parties by providing suitable and adequate site safety information, training and instructions,
- Ensuring minimization or elimination of risks regarding points of entry and exit to the site,
- Ensuring that actions regarding risks associated with falling object, excavation work, working at height, lifting operations, working in confined spaces, working alone, etc. are taken,
- Raising driving safety awareness of employees and ensuring the compliance of safe driving provisions for all vehicles,
- Ensuring the prevention of adverse impacts of chemicals/waste on human health and the environment,
- Raising OHS awareness of employees and third parties who use, store or transport hazardous materials/wastes,
- Ensuring the compliance of all standards established in Turkish legislation,
- Ensuring that measures for fire are taken and providing to all personnel about emergency preparedness and response,
- Ensuring the prevention of traffic accidents and promoting traffic safety with all personnel and third parties.

General Facility and Operation

General Site Rules

General site rules will be applied to all employees on the project, including employees of contractors and subcontractors, all related personnel from third parties and visitors. Those rules are comprised of brief information about site emergency response plan, emergency contacts, map with permission marks and all other necessary information, and those will be shared with all employees and third parties.

Site Entrance and Exit

The entry to the Project area will be subject to the security personnel's supervision to ensure that all entries are performed in accordance with health and safety system and to prevent unauthorized access.

Security personnel should be trained to meet both legislative and international standards by HSE Manager. Emergency exits of buildings and Project site should be clearly marked to be visible even in total darkness and be unobstructed at all the times.

There should be minimum two exits from any work area.

Safe Access

Passageways for pedestrians and vehicles within and outside buildings should be segregated and provide for easy, safe, and appropriate access. Equipment and installations requiring servicing, inspection, and/or cleaning should have unobstructed, unrestricted, and ready access. Only authorized personnel have access to dangerous operation areas and measures will be taken by locked door to prevent unauthorized access to dangerous areas should be in place.

Parking in Project Area

Parking at the Project site will only be restricted to the designated area. Parking shall be reverse and in the direction of exit. It is forbidden to park in front of fire extinguishers or hydrants, waste storage areas and emergency exits. Plant Management takes the necessary measures and informs the entire plant personnel.

Smoking

Smoking in the construction site, in the plant and in offices is strictly forbidden. There will be a designated open-air area or areas for smoking, where smoking is allowed only. Warning signs will be placed in accordance with standard regulations. Moreover, employees smoking other than at the designated areas will be warned and fined, if necessary.

Vehicles, Construction Machinery and Trucks

Back-up alarms of construction machinery and trucks shall be operational, and all vehicles will have a fire extinguisher and a first aid kit. If there is no sight during maneuvers, a banksman shall be present. It is forbidden to dump for trucks and reverse maneuver for construction machinery without a banksman.

Industrial Hygiene

Industrial hygiene training will be included in general OHS training for all employees and further training, awareness sessions, etc. organized by workplace/company doctor to raise industrial hygiene awareness. Eating in the plant and construction site is forbidden. Only designated areas shall be used for eating purposes. Restrooms shall be cleaned, and soap and tissue dispensers shall be refilled daily.

Working environment in terms of dust, noise, lighting, temperature, airflow and quality, etc. will be adjusted according to related regulations and measurements should be completed according to the Regulation on Occupational Hygiene Measurement, Testing and Analysis Laboratories during the construction and operational phases.

Working Hours

The working hours in construction and operation phases of the Project will be in accordance with the legal work and overtime hours stated in the Labor Law. Working hours can be shortened and additional required resting hours can be provided to the workers as a result of risk assessments and exposure to a hazardous situation.

Special working hour arrangements will be made under extreme conditions such as exposure to extreme hot, cold and humid environments to prevent health risks of employees. Work and rest periods can be determined and implemented by work-specific risk assessments for the activities such as working in confined spaces, gaseous, dusty or noisy areas.

Office Works

Offices will be cleaned and ventilated regularly. If it is not ensured, necessary warning signs shall be placed indicating the floor is slippery. Deteriorations, shelves and other materials will be repaired and/or fixed. Cleaning materials will be used with proper PPE and informed with the Material Safety Data Sheets (MSDSs).

Air conditioning devices will be regularly controlled according to industrial hygiene necessities. Sufficient lighting will be provided to the personnel working in the office. All employees shall be trained on office ergonomics.

Electrical equipment will be checked and labelled color codes in every three months by the electricians. Electrical distribution panels and fuse boxes will be kept locked, labelled and prevented from unauthorized use. Office will be equipped with detectors and fire extinguishers in case of fire hazards. Emergency exit doors and roads will be set at least 80 cm in length.

Employees who are exposed to workplace violence, retaliation, mobbing or any types of discrimination will be encouraged to report the situation in accordance with the Grievance Mechanism Procedure.

Housekeeping

Employees will be informed through training that the major sources of hazards are negligence of keeping the site clean and tidy during all phases of the Project. Those training will include the some of the following consequences of lack of cleanliness and tidiness:

- Trip and fall hazards: Materials and equipment left on the floor can cause trip and fall of an employee. The result can be bone fractures and severe injury. If trip and fall is happened in a higher place without fall protection equipment, the incident may result with fatality.
- Drop of a Material: Materials left in higher places may fall down and cause injuries.
- Hygiene: Non-clean areas threaten employees' health. Biological risks that may arise in the site are also assessed in this context and are tried to be avoided. All employees should wash their hands regularly, especially prior to eating and drinking.

All wastes generated in the site will be stored in the designated waste storage areas, by segregating according to their type. Waste management implementations are specified in Waste Management Plan for all phases of the Project.

Storage Conditions

Spare parts and materials will be stored in designated areas by considering their availability in the market and storage conditions. Maximum stacking height should be 3 meters. Heavy materials will be stored on lower shelves while lighter ones on the higher shelves as a measure against falling.

Chemicals will be stored according to their hazardousness classifications and MSDSs. All chemicals will be ordered according to need and stored according to MSDSs. Bulk buying and storage will not be allowed. Hazardous materials will be stored in accordance with the relevant national regulations.

Emergency Preparedness and Response

Existing Emergency Response Plan (see Appendix A) will be followed, and the following issues should be prepared and implemented, if they are not included in the existing ERP. Moreover, existing Covid-19 Emergency Response Plan (see Appendix B) should be followed and updated, if the standards differ and become more stringent.

- Emergency scenarios and relevant emergency preparedness and response actions with the allocations of responsibilities to local communities and authorities where appropriate,
- First Aid training,

- Specific stakeholder engagement based on consultation and participation with government and communities regarding the nature and potential consequences of the Project-related risks,
- Training of the personnel for the response to emergencies in accordance with the requirements outlined in the specifications,
- Emergency drills to be conducted, frequencies and formats according to Regulation on Emergencies in Workplaces,
- Evaluation of findings and lessons learnt from drills and corrective actions.

Management of Physical Impacts

Noise and Vibration

In the construction and operation phases of the Project, noise sources include the machinery and equipment as well as the Project units such as cogeneration and wastewater treatment plant. Noise limits of workplaces is defined by the NESREA Regulations.

Mitigation measures for reducing noise both in construction and operation phases including the measures against the occupational noise exposures are provided below:

- Equipment will be selected with lower sound power levels.
- Silencers will be installed where possible.
- High noise areas will be identified and marked, and personnel will wear personal noise protecting gears all the time when working in such high noise areas where the noise level is over 85 dBA.
- Structures will be designed and constructed with effective noise isolation.
- No employee will be exposed to a noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection.
- The grievance mechanism will be used effectively.

Mitigation measures in order to minimize the impact of vibration are listed below:

- Tools and equipment with lower vibration levels will be selected.
- Protective clothing to keep the employees warm and dry will be supplied.
- Task rotation and time limits will be implemented on activities with high exposure levels.
- Right equipment for works with risks are needed to be provided and well maintenance in good condition will be ensured.
- Information on self-protection and training will be provided to employees in tool maintenance and usage, for example avoiding gripping the tool too tightly.

Electrical Works, Electrical Equipment and Hand Tools

Recommended measures to prevent, minimize and control electrical hazards that might result from electrical works, equipment and/or hand tools are presented below:

- All energized electrical devices and lines will be marked with warning signed.
- Devices will be locked-out and tagged-out during service and maintenance.
- Locked-out and tagged-out awareness will be provided by HSE Manager before the work.
- All electrical cords, cables and hand power tools for worn-out or exposed cords and manufacturer recommendations for the maximum permitted operating voltage of the portable hand tools will be checked.
- Power cords and extension cords will be protected against damage.
- Only approved extension cords will be used.

- No approach zones around or under high voltage power lines will be established.
- Rubber tired construction or other vehicles that come into direct contact with, or arching between high voltage wires will be taken out of service for periods of 48 hours and the tires will be replaced to prevent catastrophic tire and wheel assembly failure potentially causing serious injury or death.
- Detailed identification will be performed and all buried electrical wiring before any excavation work will be marked.
- Flexible cords to be used on construction site will be rated as heavy duty, and those cords will be either protected by a suitable enclosure or barrier or located where protected from mechanical damage, damaged by liquids or high temperature.
- Cords will not exceed the maximum length stated in the related regulations.
- Hazard warning lights will be installed inside electrical equipment enclosures to warn of inadvertent energization.
- Appropriate labelling of service rooms housing high voltage equipment and where entry is controlled or prohibited will be ensured.
- Voltage sensors will be used before and during workers' entrance into enclosures containing electrical components.
- Specialized electrical safety training will be given to those personnel working with or around exposed components of electrical works.
- Deactivation and proper grounding of live power equipment and distribution lines according to applicable legislation and guidelines whenever possible before work will be performed.
- Electrical hand tools will be inspected by a qualified electrician every three months and by workers any time before starting the work.
- Electrical equipment that does not have a control mark on it will not be used.
- Electrical equipment shall only be repaired by electricians.
- Protective parts of any electrical hand tool will not be removed.
- If the electrical hand tool is sparking, it will be used with Hot Work Permit or in the general permitted area.
- After the completion of work, electrical hand tools will be kept with pulling their plug out to prevent trip and falls.
- When the work with electrical hand tool is finished, it will be returned to its storage place.
- The employees that will use the electrical hand tool will be trained.
- The employees conducting electrical works or using electrical equipment and tools will use the relevant PPE.

Eye Hazards

Eye hazards should be assessed in detail in risk assessment reports/plans. The protective equipment for eyes will be used depending on the work to be conducted.

Hot Works

The mitigation measures on the hot works such as welding, cutting, grinding, and post-weld heat treatment works to be conducted during the construction and operational phases of the Project are explained in this section.

Work permits will be required for the hot works and employees without Hot Work Permit will not conduct any hot work. The Work Permit might be given with necessary training, licenses or certificates. Risks of the work or related risk assessment should be read and understood by the employees who are going to involve in hot works. Minimum OHS requirements to start a hot work are: Work Permit,

approved fire work equipment, fire extinguisher or fire extinguishing system, fire blanket, fire observe (if necessary) and hot work specific PPE according to related risks.

The area where the hot work will be conducted will be free of any flammables and explosives, and the area will not be left without cooling.

Industrial Vehicle Driving and Site Traffic

Traffic and traffic-related risks and impacts will be eliminated, minimized or prevented through the following measures:

- Unauthorized vehicles will not be allowed to enter the Project area.
- All drivers will comply with the Highway Traffic Regulation.
- Pedestrian walkways will be marked and kept clear.
- For pickups, heavier vehicles and all construction vehicle operators, SRC certificate is obligatory.
- On-site and off-site speed limits, which is determined by national legislation, will be complied with by employees.
- Drivers and passengers shall fasten the seat belts. Seat belts shall be fastened before driving and cannot be unfasten until the vehicle is properly parked.
- Regular and legal maintenance of the vehicles will be performed in line with the related regulations.
- Each vehicle will carry first-aid kit, fire extinguisher, reflector and spare tire.
- Overloading of the vehicles is forbidden, even if the vehicle tonnage is appropriate.
- Headlights, mirrors, windows and seat belt system of the vehicles will be operational and maintenance of those will immediately be provided when these systems have problems.
- No passenger is allowed to be carried on the back of a pickup or in heavier vehicles, or in the cabinets of construction machinery.
- Tires will be controlled regularly.
- Smoking is prohibited on vehicles.
- Cell phone usage in vehicles on the road is prohibited.

Working with Construction Machinery

Measures to be taken when working with or around the construction machinery are listed as:

- Construction machinery will be accepted to the site according to site entry rules.
- Daily and periodic maintenance of construction machinery will be ensured and shared with OHS team and the operator will perform a visual check before each use.
- Obeying general rules for operators, which are summarized below, will be ensured.
 - Operators will have a valid operator license.
 - Operators will have induction training.
 - Operator will visually control his/her construction machinery from top and bottom.
 - Operator will check any leakages such as oil, engine fluids, accumulator etc.
 - Operator will check engine, gearbox, hydraulic oil and radiator fluid levels.
 - Operator will check the pallets/tires, bolts, pins etc. whether they are broken or not.

Operator will be sure there is nobody around the work area and work with the guidance of flagman.

Operator will start the engine while parking brake is set.

Operator will check all the displays while the engine is warming up for 2-3 minutes.

Operator will control all the lights before night work.

Operator will not work if his/her view is blocked or continue to work with one or more flagmen.

Operator will not use cell phone while using the machinery.

Helmet usage is not obligatory for closed cabin machinery, but the operator will use safety shoes and reflector vests.

Operator will pay attention to power lines. If there is a risk of contact, energy will be cut-off first.

At the end of the work, the operator will also control the machine surroundings and park the machine at a safe location. If there are malfunctions or areas to improve, the operator will inform the next shift's operator.

When the work is finished, the operator will turn off the engine and lock and secure the machinery.

- Obeying general rules for employees, which are listed below, will be ensured.

Employees must be aware of the hazards and dangers of nearby working machines before starting the work.

All employees will use reflective vests/work clothes.

Pedestrian walkways should be used. The construction machinery's work area will not be used as a shortcut.

Employees will have the eye contact with the operator during works they perform nearby the machinery in motion.

- Refueling of construction machinery will be performed in designated areas or outside of the Project area.
- Construction machinery will not reverse without a flagman.

Working Environment Temperature

Mitigation measures for prevention and control of occupational exposure to heat occurring during the Project activities are listed below:

Pressure vessels and piping will be inspected and maintained regularly.

- Adequate ventilation will be supplied to the work areas to reduce heat and humidity.
- The time required for work in elevated temperature environments will be reduced and access to drinking water will be ensured.
- Surfaces where personnel come in close contact with hot equipment will be shielded.
- Appropriate warning signs and PPE will be used near high temperature surfaces and environments.

Ergonomics

Employees will be provided with the appropriate tools, equipment, parts and materials. Controlling and identification of ergonomic risk factors and reduction of hazards will be provided through the following means when and where necessary:

- Engineering controls; which are the most reliable means to controlling or preventing injury. This is achieved by focusing on the physical modifications of jobs, workstations, tools, equipment, or processes.

- Administrative controls; which means controlling or preventing injury by implementing administrative changes such as job rotation, job enlargement, rest/recovery breaks, work pace adjustment, redesign of methods and/or worker education.
- Work practice controls; which means controlling or preventing injury through proper work practices. These include proper work techniques, posture and conditioning.
- PPE; which is personal protective equipment and can control or prevent injury.

Working at Height

Working from a level difference and the possibility of injury as a result of falling are considered for the employees as “working at height”. Travelling, conducting a stationary job, or any time under risk of exposure to a fall from a surface that is not protected by approved handrails, guardrails or some other/similar types of approved arrest or restraint devices are included in the scope of working at height.

The hazard distance for falling is measured from the employee’s feet to the walking/working ground. The prevention of fall should be planned during the design stage as possible, and continuously controlled. Hazards resulting from fall risks can be eliminated by several measures. These are:

- Elimination of the works at height: performing the work on the ground as much as possible or maximizing the pre-assembly works on the ground for the structural components
- Design safety and engineering controls: reviewing the project drawings, interfacing with the project owners and material suppliers to design safety features into structure, material or equipment to be used, or addition of the safety features such as attachment points for guardrail system, etc. to the project design.
- Fall prevention and protection systems: fall prevention and protection systems differ in terms of the work type. Guardrail systems, fall restraints, fall arrest systems, barricades, etc. are some of them. The most effective one should be selected depending on the work to be performed.
- Elevated equipment: this equipment are the ones which the employees are required to be tied-off 100% of the time when conducting the job such as crane suspended works or scissors lifts.
- Housekeeping: housekeeping is also another important factors which may cause falling. The whole area should be enforced daily clean-up and free of debris, materials, unnecessary equipment and provided a sufficient number of trash containers for cleanup.

Working with Ladders

General procedures for the portable ladders are listed below in the scope of the Project:

- Handmade ladders are forbidden.
- The ladders will be checked daily before usage and controlled by the maintenance team and tagged.
- Ladder steps will be clean and anti-slide.
- There will be insulating caps on the ends of the ladders; ladders without caps will not be removed from the site.
- Ladders will not be considered as working platforms and no work will be performed on ladders more than 15 minutes.
- Ladders will be installed at 1:4 and it will be 90 cm longer than the climbed level.
- Last two steps of the ladders will not be used.
- Damaged ladders or ladders with broken steps will not be removed from the site and those ladders will be notified to the maintenance team.
- When climbing, 3-point rule (two hands and a foot, or two feet and a hand) will be maintained at all time. While climbing and going down, manual handling is forbidden.

- For vertical ladders, a cage is required after 2.5 m length and a resting platform for longer than 4 m.
- Conductive (metal) ladders will not be used in electrical works and in areas where power lines are present. In such works and areas, fiberglass and nonconductive ladders will be used.
- The ladders will not be used in strong windy weathers. Strong wind speed is determined as 12 m/s unless otherwise specified.
- The ladders will not be placed at door entrances. If it is inevitable to do so, the door will be locked.
- The ladders will not be placed on ice or snow. If it is necessary to do so, it will be fixed.
- The ladders will not be placed at places where there is active traffic. If it is necessary to do so, appropriate barriers and warning signs will be placed. This measure must be effective enough to remove vehicle crash risks.
While there is an employee on the ladder, it is forbidden to change the position or location of it.
Ladders will be carried horizontally to minimize the chance of its contact with power lines.
- Ladders will only be used for their purpose of manufacture. Ladders will not be used in a horizontal position like a walking platform, bridge, etc.
- For fixed ladders, handrails will be installed for ladders with more than four steps.
- There will be a minimum gap of 18 cm between the steps, and between the ladder and wall (or another fixed part).
- The distance between the steps will be equal and never exceed 30 cm.
- The ladder will be kept oil- and grease-free.
- Worn-out or damaged ladders will not be used.

Excavation Works

Mitigation measures for the excavation works are listed below:

- Work Permit shall be obtained to establish excavation works.
- Excavation works shall be performed under supervision.
- Excavation equipment shall be checked before use.
- Excavation team shall have training on Excavation Risks.
- Excess excavated material shall be disposed of at least 1 meter away from the excavation area.
- Risk assessment shall be done during the planning of excavation works.
- If there is a live line (electricity, gas, steam, etc.) in the excavation area, energy shall be cut off or if it is not required to cut it off, the precautions that should be taken shall be specified by Work Permit.
- If vibration will likely cause subsidence, special precautions shall be taken.
- Depending on the condition of the excavated soil, it shall be strengthened by excavation or lining or by 45 degrees angling, after the opinion of HSE Manager.
- Working in the excavated area subjects to Confined Spaces Work Permit.
- For excavations deeper than 5 m, vehicle operation around the excavation area shall be prohibited. At least two locations shall be determined to go down, if it is necessary and the slope of the excavated area shall be checked by supervisor before going down.

- The excavation area shall be normally closed within the same day. If it is not possible, the excavation area shall be surrounded by barriers and warning lights shall be located for the night. Manual excavation shall not be preferred if it is not compulsory due to technical reasons. Excavations deeper than 50 cm shall not be performed manually. Special training shall be conducted for workers who will perform manual excavation.
- The working hours of employees are evaluated according to the condition of the ground and the working hours are shortened according to this assessment

Illumination

Light intensity of working areas should be adequate for the general purpose of the location and type of activity. Minimum limits for workplace light intensity as defined by NESREA regulations shall be adhered to. Measures regarding the illumination of the project site area are provided below:

- Energy-efficient light sources with minimum heat emission shall be used.
- Measures shall be undertaken to eliminate glare/reflections and flickering of lights.
- Precautions shall be taken to minimize and control optical radiation including direct sunlight. Exposure to high-intensity UV and IR radiation and high-intensity visible light shall also be controlled.
- Measurements shall be done according to Regulation on Health and Safety Measures to be taken in Workplace Buildings and Annexes and TS EN 12464-1: 2013.
- Emergency lighting shall be installed to all necessary areas and buildings.

Lifting Operations

Mitigation measures regarding lifting operations are provided below:

- Before lifting machinery and vehicles start to work, they shall be checked by their operators. The steel ropes, chains, hooks, sling, chain blocks, and automatic stoppers shall be checked by authorized technical personnel once a year. This period might be shortened by risk assessments.
- The crane that will be used during lifting operations shall be accepted in accordance with site acceptance rules.
- Minimum requirements of the crane are crane license (official registration certificate), periodic maintenance documentation, operation of the detection devices, condition of the operator cabin, presence of at least fire extinguisher and first-aid kit
- Minimum requirements of the operator are operator license, insurance of the operator, the medical condition of the operator, induction training of the operator and PPE usage of the operator.
- Before starting the lifting operation, the whole area or the area where the load will travel shall be enclosed with barriers to protect working under the load. If this is not possible, the area shall be controlled by several watchmen.
- Standing under the suspended load is forbidden in any case. If it is necessary to do so, the risks to people must be minimized by safe systems of work and appropriate precautions.
- The lifting shall be performed by tying down the load by a trained rigger.
- Even though the operation can be performed by only one rigger, another rigger with greater experience can be used as superintendent together with several flagmen.
- If the flagmen are more than one, the operator shall follow the only one flagman's instructions and this flagman shall be selected before the operation starts.

- The communication method between the flagman and operator shall be determined before the operation by considering any malfunctions in communication devices. For the lifting with high risks or for human lifting, free heave and barge are forbidden by considering the risk of communication gaps.
- Riggers, flagmen and superintendent shall start to the work as trained in lifting operations. This shall be recorded in the Training Plan.
- The operation shall not start without lifting plan

Management of Chemical Impacts

Air Quality

Air quality of working environment will be maintained and measured according to NESREA regulations and standards. Necessary PPE and training will also be decided according to risk assessments.

Fire and Explosions

Mitigation measures regarding fires and explosions resulting from self-heating fuel piles, ignition of flammable materials and sources are presented:

- Flammables shall be stored away from ignition sources and oxidizing materials.
- Flammables storage area shall be remote from entry and exit points into buildings, away from plant ventilation and intakes or vents. It should have natural or passive floor and ceiling level ventilation and explosion and use spark-proof mixtures.
- Electrical grounding, spark detection and if needed quenching systems shall be provided where the flammable material is mainly comprised of dust.
- Fire hazard areas shall be defined and labelled to warn of special rules such as prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment.
- Specific worker training in handling of flammable materials and fire prevention and suppression shall be provided.
- Fire extinguisher equipment (ladders, ventilation devices, fire extinguishers, etc.) will be purchased and will be kept in good condition.
- Fire extinguisher equipment will be labelled /signed according to related regulations and will be placed at easily accessible locations.
- Fire extinguishers will be placed close to areas that have fire risks such as chemical storage and welding areas.
- Personnel shall not be allowed to interfere with electrical appliances; only authorized personnel will be allowed to change the electrical installation. Electrical appliances will be closed and unplugged when they are not in use.
- Personnel who are responsible for the management of inflammable materials shall be appointed and shall be trained. Storage, transportation, and use of these inflammables will be established in compliance with national and international standards.
- Leakage and spillage of inflammable liquids shall be immediately cleaned and repaired.
- Fire exits and exit doors will be installed in both temporary and permanent structures/buildings and will be kept open all the time.
- A smoking area out of the plant will be designated and a fire extinguisher will be provided for this area.
- Fire practices will be established according to health and safety regulations.

Working in Flammable and Explosive Environments

Risk assessment shall be performed before working in flammable and explosive environments. Necessary signs should be placed on the site. Emergency communication numbers shall be placed. Conditions and situations to be aware of are defined under this section. These conditions and related mitigation measures are as follows:

Flammable and explosive liquid storage shelves and barrels shall be earthed against static electricity hazards. Static electricity is the most important fire cause.

- Hot works such as welding, cutting etc. shall not be performed near flammable and explosive liquids. Special precautions shall be taken when it is necessary to do so.
- It shall be ensured that there is no spill, leakage etc. where flammable and explosive liquids are present.
- Fire extinguishers shall be placed to appropriate locations where there is a work with flammable and explosive liquids.
- Training shall be conducted on the use of fire extinguishers.
- The storage areas of flammables and explosives shall have ventilation and the area shall be ventilated three times in an hour. The frequency might be increased in special occasions.
- Flammable and explosive materials shall be stored in their original packages. For small usage quantities, they shall be carried with special safety containers, not in glass or plastic containers.
- Gasoline and thinner shall not be used in cleaning works. Non-flammable solvents shall be used.
- During the operation of the Project classification should be assessed beforehand where explosive mixtures could be generated by biogas releases,
- The employees shall be trained on the explosive gases and their potential impacts.
- In order to prevent unauthorized access, area limitations and labelling shall be done.
- Places, where potentially explosive atmospheres to be able to occur, are marked with specific signs.

Hazardous Materials

Measures shall be taken to avoid or minimize the potential for occupational exposure to hazardous materials and substances that may be released by the Project. Mitigation measures regarding hazardous materials are presented below:

- All hazardous materials shall be assessed in accordance with relevant regulatory and international requirements.
- All chemicals purchased from suppliers used on the site will be accompanied by their MSDSs that meet the standards.
- Storage of fuel will be in tanks equipped with locking devices and which have secondary containment (with %110 volume capacity) that are located on a platform in a designated area located away from any watercourse or drain.
- Spill kits, protective equipment, and other necessary equipment will be available where hazardous materials are handled, to enable any spills to be cleaned up.
- Appropriate first aid will be located close to hazardous material storage areas such as eyewash, showers, and first aid kits.
- Hazardous materials will only be transported in vehicles authorized for the transport of hazardous substances.

The transfer of hazardous materials from vehicles to storage tanks shall be conducted on impervious hard standing, which is sloped to a collection or a containment structure, not connected to municipal wastewater/storm water collection system.

- Incompatible materials (acids, bases, flammables, oxidizers, reactive chemicals) shall be stored in separate areas, and with containment facilities separating material storage areas.
- The storage and use of hazardous substances shall be done under conditions of maximum security.
- Drummed hazardous materials shall be stored in areas with impervious surfaces that are sloped to retain any spills/leaks.
- Containers holding flammable and/or toxic materials will be kept permanently closed and covered. They shall be kept in their original packaging and they shall be handled and transported under maximum security.
- Any accidental leaks of fuel or oil will be immediately cleaned up with absorbent material and collected in closed and labelled containers - temporarily stored in specially designed spaces until delivery to an operator.
- Chemicals with different hazard symbols shall not be stored together.
- All Hazardous Materials shall be disposed of according to the requirements of relevant regulation.

Gas Cylinders and Chemicals

Mitigation measures developed to be implemented during works with compressed gas cylinders and chemicals are presented below.

- Cylinders shall be kept in vertical position all the time and be stored separately as full or empty and in accordance with their gassiness. The storage areas shall be away from the smoking areas.
- Manual handling of the compressed cylinders shall be forbidden.
- It shall be forbidden to roll full or empty gas cylinders on the ground.
- The flammable gas cylinders shall be stored with 6 m interspaces.
- Working with chemicals shall not be performed without MSDSs.
- MSDS shall be read by the person who assigns the work to workers and he/she shall be sure that it is completely understood.
- A copy of MSDSs should be kept with chemicals in languages that all employees can understand and if it is necessary copies and MSDSs should be shared with workers.
 - Special risk assessments shall be performed for working with chemicals. The work shall not be initiated without taking the precautions recommended in MSDSs.
- The work shall not be started without ensuring the minimum PPE usage as recommended in MSDSs.
- Areas, containers, pipes and similar installations that contain hazardous chemicals shall be labelled or marked in accordance with the relevant legislation and Chemicals and Hazardous Materials Management Plan in a way that the label shall indicate the chemical and its hazards.
- Containers that will be used for temporary transportation shall be suitable for chemical transportation and shall be labelled. The label shall indicate at least name of the chemical, hazard description (corrosive, poisonous, suffocative, irritant, etc.) and pictogram.
- Chemicals that are transported to the application area with temporary containers shall be taken back to the Storage Area after the work is finished.
- The environmental hazards of the chemical shall be assessed before the work and proper spill kits shall be placed in the work area.
- Chemical spill drills and training should be repeated at least once in a year.

- For the works performed in confined spaces, the chemicals and the risks shall be indicated in Work Permit.
- The volatilization of the chemical shall be assessed for the works that will be conducted in confined spaces. Toxic and suffocating chemicals shall only be used in confined spaces after special risk assessments have been made.
- Corrosive, oxidizing and reactive chemicals shall be segregated from flammable materials and from other chemicals of incompatible class (acids vs. bases, oxidizers vs. reducers, water sensitive vs. water-based, etc.), stored in ventilated areas and in containers with appropriate secondary containment to minimize intermixing during spills.
- Workers who are required to handle corrosive, oxidizing, or reactive chemicals shall be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, face shield or goggles, etc.).
- Where corrosive, oxidizing, or reactive chemicals are used, handled, or stored, qualified first aid shall be ensured at all times. Appropriately equipped first-aid stations shall be easily accessible throughout the place of plant, and eye-wash stations and/or emergency showers shall be provided close to all workstations where the recommended first-aid response is immediate flushing with water.

Management of Biological Impacts

Biological agents, which include bacteria, viruses, fungi (mold), other microorganisms and their associated toxins, have the ability to adversely affect human health in a variety of ways, ranging from relatively mild, allergic reactions to serious medical conditions, even death. These organisms are widespread in the natural environment; they are found in air, water, soil, plants, and animals. Because many microbes reproduce rapidly and require minimal resources for survival, they are a potential danger in a wide variety of occupational settings.

Exposure to Biological Hazards

Exposure to biological hazards may occur during demolition, renovation, sewer work, work on air handling systems, or other construction work from contact with contaminated or disease-carrying materials, such as soil, water, insects (mosquitoes, ticks) and animals. In the site, biological health hazards will be most commonly found from an accumulation of animal waste and the presence of rodents and insects. Common areas have potential of biological hazards.

Fungi (Mold) Hazards

Fungi (mold) are found both indoors and outdoors, all year round. There are many thousands of species of mold and most, if not all, of the mold found indoors comes from outdoor sources. Mold seems likely to grow and become a problem only when there is water damage, high humidity, or dampness. Molds are organized into three groups according to human responses: Allergenic, Pathogenic and Toxigenic. Potential health effects and symptoms associated with mold exposures include allergic reactions, asthma, and other respiratory complaints. There is no practical way to eliminate all molds and mold spores in the indoor environment; the way to control indoor mold growth is to control moisture.

- If mold is a problem in the workplace, the mold and eliminate sources of moisture must be cleaned up.
- Fixation of the source of the water problem or leak is needed to prevent mold growth.
- Reduction of indoor humidity (to 30-60%) is required to decrease mold growth.
- Cleaning mold off from hard surfaces with water and detergent, and drying it completely is required.
- Absorbent materials, such as ceiling tiles that are moldy may need to be replaced.
- Condensation on cold surfaces can be prevented by adding insulation.
- In areas where there is a perpetual moisture problem, do not install carpeting.

Respiratory protection for exposure to mold will depend on the size of the particle and its level of toxicity. It is important to take precautions to limit your exposure to mold and mold spores. To limit the exposure to airborne mold, at a minimum, an N-95 respirator is suggested. If oil is present in the air, make sure to use either an R or a P designed filter.

Poisonous and Infectious Animals

Many different poisonous and infectious animals might be found in or around the Project site and workers should be aware of these health hazards before starting work in a specific location. All bites by such wildlife must be considered a possible exposure to the biological hazards. Rodents can exist around the Project site. The most sensible way to avoid contact with rodents is to prevent them from infesting the work site. Safety precautions should be taken. Safe disposal of rodents and proper cleaning and disinfection of rodent-inhabited areas are keys to minimizing exposure to the virus.

Management of Radiological Hazards

Some of the project personnel may have high exposure to electric and magnetic fields due to working in proximity to electric power generator, equipment and connecting transmission lines. Occupational exposure shall be prevented or minimized through the mitigation measures provided below:

- Potential exposure levels in the plant shall be identified and personal monitors shall be used during working activities.
- Personnel shall be given training in the identification of occupational electric and magnetic field levels and hazards.

Special Hazard Environments

Working in Confined Spaces

Management measures for confined spaces are presented:

- Engineering measures shall be implemented to eliminate, to the degree feasible, the existence and adverse character of confined spaces.
- Permit-required confined spaces shall be provided with permanent safety measures for venting, monitoring, and rescue operations, to the extent possible. The area adjoining access to a confined space shall provide ample room for emergency and rescue operations.
- Confined spaces shall be identified and labelled by HSE Manager.
- Works in confined spaces shall require a Work Permit. Working without a permit shall require disciplinary action.
- Work Permits for confined spaces shall be given after the following inspections:
 - Control of proper entrance and escape,
 - Gas measurement,
 - Confirmation that all workers are trained (at least two employees go in and one employee as watchmen),
 - If a continuous gas measurement is required, the measurement device shall be given to the employees that go in,
 - Ventilation and lighting control.
- The works to be performed inside the confined areas shall be performed for the periods determined by the risk assessments.
- The watchmen shall not leave his/her workplace. If he/she needs to do so, another watchman shall be appointed, or the work shall be stopped.
- If there is no natural ventilation or if there is hazardous gas accumulation, a ventilation system shall be installed.
- A rescue kit shall be ready for fainting and other situations in confined spaces.
- Employees entering the confined space shall use PPE in accordance with the risk assessments.
- If lighting is not enough in confined spaces, lighting shall be provided. In case of a presence of gas in the environment, ex-proof lightning equipment shall be used to prevent any possible explosion risks.
- Instead of using 220 V electrical hand tools, air-powered or low power hand tools shall be preferred for confined spaces. However, if the work requires 220 V or more, an isolation transformer shall be used.
- The decision on the power of the isolation transformer shall be made depending on the work to be done and the opinion of the electricity team.

Working Alone

General procedure for Working Alone are presented below:

Risk Assessment: Risks arising from the conditions and circumstances of the work site will be assessed with the Occupational Health and Safety Committee and Risk Assessment Team, including input from the worker, in order to reduce the probability of an incident. Refer to the Risk Assessment Procedure.

Eliminate or Reduce the Risk: All reasonable measures will be taken to eliminate the risks identified, which include the development of safe work procedures, establishment of an effective communication system, training of workers, and ensuring access to emergency services in case of injury or incident.

Key Steps to Follow:

- Perform a risk assessment.
- Identify the risks in working alone.
- Establish safe work procedures.
- Keep work alone procedures current.

Certain circumstances make working alone hazardous. Identifying the hazards inherent to these circumstances depends on accurately defining what working alone is and evaluating the situation and the degree of risk. Whether a situation poses, a high or low risk will depend on the type of work activity, the work environment, and the potential consequences of an emergency, accident, or injury. The wide range of factors makes it important to assess hazards specific to each work alone situation; determine the level of risk; and consider the employee's knowledge, skills, and training. Working Alone or Working in Isolation describes situations when a worker performs a job function during employment, where they:

- Are the only worker for the employer at a workplace at any time;
- Work at a worksite remote from other workers;
- Work in circumstances where assistance is not readily available;
- Do not have direct supervision by the employer or a supervisor;
- Are not in the presence of another employee directly associated with the same employer;
- Work in an area where the worker does not have visual contact with a co-worker; or
Travel away from a base office to perform job tasks; for example, client meetings.

Employees who travel alone may be exposed to the risks of injury from a vehicle accident, extreme weather conditions, or being stranded in remote areas. Doing fieldwork alone carries a degree of risk in relation to the location and access to communication and emergency response. The employer must identify workplace hazards to ensure the health and safety of the employee who works alone. Determining the level of risk involved with the type of activity, task, and environment helps form safe work procedures and develop controls to eliminate or reduce the risks.

A worker representative must participate in assessing the hazards and risks and developing the necessary controls. Employers must inform affected workers of the hazards identified and the methods they will use to control or eliminate the hazards in working alone. The worker should also receive a copy of the hazard assessment.

Factors to consider in hazard identification will be:

- Locations where employees work alone.

- Type of work activity (for example, welding).
- Hazards inherent to the work activity (for example, equipment failure, toxic gasses).
- Hazards inherent to the work environment (for example, heat, cold, hostility, drug abuse).
- Previous incidents, injuries, reports, and near misses.
- Control measures and precautions currently in use.
- Details on how to seek or provide emergency assistance.
- Evacuation and emergency procedures.
- Equipment needed for employees working alone.
- Information and training provided to the worker.
- Gaps or patterns to address.

After all hazards have been identified, reducing risks requires safety measures and systems suitable to the worker's needs. Before any employee can work alone or in isolation, employers must develop a procedure that both the employer and employee sign. Each working alone activity requires procedures specific to that activity and work environment. The worker must have adequate training in the use of the equipment, systems, and procedures for their effective application.

Consulting with the occupational health and safety committee representing the worker or with the worker directly is key to developing and successfully implementing safe work practices. Workers experience the hazards first-hand and can help identify controls.

Written safe work procedures shall include an effective communication system and a way for employees to get help if there is an incident. The communications system must be responsive to the type and level of risk of the work and worksite. The three main components of effective communication are the frequency of check-in, dependability of the system, and training.

Effective communication systems include:

- Radio communication;
- Phone or cellular communication; and
- Any means that provide effective communication considering the risks involved (for example, satellite phone, two-way radios, silent alarms).

Effective communication may require constant or intermittent mechanical or electrical surveillance or use of security systems, personal pagers, two-way radios, emergency sounding devices, visual monitoring systems, or similar equipment. Post telephone numbers of the regular and emergency contacts in easily visible locations.

The level of risk identified in the hazard assessment will determine the frequency of check-in or call-in times to contact the worker. Using the telephone for communication at regular intervals may be adequate in low risk situations. For personnel working in high hazard environments or at night in work environments that attract criminal victimization, check-in would be more frequent.

Check-in scheduled at regular intervals ensures the safety and well-being of the employee working alone. Check-in procedures must clearly define time intervals (time between checkins), shift end check-in, and procedures to follow when you cannot contact the worker. The employer, another employee, or the person the employer designates to check on the employee who is working alone, must know about that employee's activities and be capable of putting the emergency response plan into effect.

Personnel Protective Equipment (PPE)

Other than office and allowed areas, minimum acceptable PPE that shall be used in the plant area are not limited with but determined as below.

- Helmet (TS EN 397 +A1)
- Eye Protection Goggles (TS 5560 EN 166)
- Work Shoes (TS EN ISO 20345, TS EN 13832-3)
- Ear Protection PPE according to Decibel (dB), comply with standards (TS EN 352-1, 352-2, 352-3)
- Working at Height PPE;
 - Positioning Points and Safety Rope (TS EN 358)
 - Parachute Type Seat Belt (TS EN 361)
 - Personnel Protective Equipment to prevent falling from a height-seat belt (TS EN 813)
 - Rescue Equipment-Rescue Belts (TS EN 1497)
 - Rescue Equipment-Rescue Rings (TS EN 1498)
- High Visibility Jacket (According to weather conditions) (TS EN ISO 20471)
- Respiratory Protection – Face Mask against dust biological risks FFP-1,2,3 (TS EN 12942/A2)

The requirements of special PPE or any change according to site needs shall be determined by HSE Manager. Mitigation measures for PPE usage are provided below:

- If alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce a hazard or exposure, work-appropriate PPEs shall be used actively.
- Appropriate PPE that offers adequate protection to the worker, co-workers, and third parties, without incurring unnecessary inconvenience to the individual shall be identified and provided.
- PPE shall be maintained properly including cleaning when dirty and shall be replaced when damaged or worn out.
- Training programs for employees shall include proper use of PPE.
- Selection of PPE shall be based on the hazard and risk ranking and selected according to criteria on performance and testing established.

IMPLEMENTATION SCHEDULE

This Plan will be reviewed on a minimum of a three-monthly basis during construction phase and annually during operation. During steady state operations, this Plan will be reviewed on an annual basis and any necessary revisions made to reflect the changing circumstances or operational needs of the Project. Revision of this Plan will be the responsibility of project Contractor HSE Manager during construction and the environmental safeguard specialist during operations.

If the circumstances change, this Plan may be updated on an “as required” basis.

Any revisions to this Plan will be uploaded to the Document Control Centre (DCC) to ensure that all Project staff and Contractors have access to the latest version of this OHSMMP.

MONITORING

Overview of Monitoring Requirements

The monitoring measures that are to be implemented during the construction and operation phase to assess the compliance of the Project with the relevant Project Standards are described in this section. In case that any non-conformances with the Project Standards are identified, these will be investigated, and appropriate corrective actions will be put forward.

Key Performance Indicators (KPI)

The table below summarizes the key performance indicators and associated key monitoring measures that can be used to assess the progress and effectiveness of the proposed mitigation strategies.

Table 2: Key Performance Indicators (KPI)

KPI	Target	Monitoring Measure
Number of the recorded worker (internal) grievances relevant to OHS	Minimize and achieve continuous improvement in the number of the recorded internal grievances related to OHS (Target: Zero)	Internal Grievance records
Number of the reported OHS incidents	Minimize and achieve continuous improvement in the number of the reported OHS incidents (Target: Zero)	Regular internal inspections (incident reports) and audits
Total number of non-compliances with the measures identified in this Plan.	Minimize the number of non-compliances (Target: Zero)	Audit records

Record Keeping and Reporting

The records of audits, inspections, complaints, trainings and incidents will be managed in accordance with the Project's ESMS and DCC.

Annex 7: Company Code of Conduct for Implementing ESHS and OHS Standards, Preventing Gender Based Violence and Violence against Children

Our company ----- acknowledge that adhering to environmental, social health and safety (ESHS) standards, following the project's occupational health and safety (OHS) requirements, and preventing gender based violence (GBV) and violence against children (VAC) is important.

The company considers that failure to follow ESHS and OHS standards, or to engage workers to partake in GBV or VAC activities- be it on the work site, the work site surroundings, at workers' camps, or the surrounding communities-constitute acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of workers' employment. Prosecution by the Police of those who commit GBV or VAC may be pursued if appropriate.

We agree that while working on the project we will:

1. Attend and actively partake in training courses related to ESHS, OHS, HIV/AIDS, GBV and VAC as requested by our client and provide same to our workers.
2. Provide and ensure our workers wear their personal protective equipment (PPE) at all times when at the work site or engaged in project related activities.
3. Develop and take all practical steps to implement the contractor's environmental and social management plan (CESMP).
4. Implement the OHS Management Plan.
5. Ensure workers adhere to a zero-alcohol policy during work activities, and refrain from the use of narcotics or other substances which can impair faculties at all times.
6. Consent to Police background check.
7. Treat women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status.
8. Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
9. Not engage in sexual harassment-for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct, of a sexual nature, including subtle acts of such behavior (e.g. looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; giving personal gifts; making comments about somebody's sex life; etc.).
10. Not engage in sexual favors-for instance, making promises or favorable treatment dependent on sexual acts-or other forms of humiliating, degrading or exploitative behavior.
11. Not participate in sexual contact or activity with children-including grooming, or contact through digital media. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.
12. Unless there is the full consent' by all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex-such sexual activity is considered "non-consensual" within the scope of this Code.
13. Mandate our workers to consider reporting through the GRM or to their managers any suspected or actual GBV or VAC by a fellow worker, whether employed by our company or not, or any breaches of this Code of Conduct.

With regard to children under the age of 18:

14. Ensure wherever possible, ensure that another adult is present when working in the proximity of children.

15. Mandate our workers not to invite unaccompanied children unrelated to their family into their home, unless they are at immediate risk of injury or in physical danger.
16. Not use any computers, mobile phones, video and digital cameras or any other medium to exploit or harass children or to access child pornography (“Use of children’s images for work related purposes” below).
17. Refrain from physical punishment or discipline of children.
18. Refrain from hiring children for domestic or other labor below the minimum age of 14 unless national law specifies a higher age, or which places them at significant risk of injury.
19. Comply with all relevant local legislation, including labor laws in relation to child labor and World Bank’s safeguard policies on child labor and minimum age.
20. Take appropriate caution when photographing or filming children.

Use of children’s images for work related purposes

When photographing or filming a child for work related purposes, we must:

21. Before photographing or filming a child, assess and endeavor to comply with local traditions or restrictions for reproducing personal images.
22. Before photographing or filming a child, obtain informed consent from the child and a parent or guardian of the child. As part of this we must explain how the photograph or film will be used.
23. Ensure photographs, films, videos and DVDs present children in a dignified and respectful manner and not in a vulnerable or submissive manner. Children should be adequately clothed and not in poses that could be seen as sexually suggestive.
24. Ensure images are honest representations of the context and the facts.
25. Ensure file labels do not reveal identifying information about a child when sending images electronically.

Sanctions

We understand that if we breach this Company Code of Conduct, our client can authorize disciplinary action and sanctions as appropriate and Report to the Police if warranted.

We therefore understand that it is our responsibility to ensure that the environmental, social, health and safety standards are met. That we will adhere to the occupational health and safety management plan. That we will avoid actions or behaviors that could be construed as GBV or VAC. Any such actions will be a breach of this company Code of Conduct. we do hereby acknowledge that we have read the foregoing company Code of Conduct, do agree to comply with the standards contained therein and understand our company’s roles and responsibilities to prevent and respond to ESHS, OHS, GBV and VAC issues. we understand that any action inconsistent with this company’s Code of Conduct or failure to act as mandated by this company’s Code of Conduct may result in disciplinary action and may affect our ongoing tasks.

Company representative

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Annex 8: Manager’s Code of Conduct on Preventing Gender Based Violence and Violence against Children

Managers at all levels have particular responsibilities to uphold the company’s commitment to preventing and addressing GBV and VAC. This means that managers have an acute responsibility to create and maintain an environment that prevents GBV and VAC. Managers need to support and promote the implementation of the Company Code of Conduct. To that end, managers must adhere to this Manager’s Code of Conduct and also sign the Individual Code of Conduct. This commits them to supporting and developing systems that facilitate the implementation of the Action Plan and maintain a GBV-free and VAC-free environment at the workplace and in the local community. These responsibilities include but are not limited to:

Implementation

To ensure maximum effectiveness of the Company and Individual Codes of Conduct:

Prominently displaying the Company and Individual Codes of Conduct in clear view at workers’ camps, offices, and in public areas of the workspace. Examples of areas include waiting, rest and lobby areas of sites, canteen areas, health clinics.

Ensuring all posted and distributed copies of the Company and Individual Codes of Conduct are translated into the appropriate language of use in the work site areas as well as for any international staff in their native language.

Verbally and in writing explain the Company and Individual Codes of Conduct to all staff.

Ensure that:

All direct reports sign the ‘Individual Code of Conduct’, including acknowledgment that they have read and agree with the Code of Conduct.

Staff lists and signed copies of the Individual Code of Conduct are provided to the GCCT and the client.

Participate in training and ensure that staff also participate as outlined below.

Staff are familiar with the Grievance Redress Mechanism (GRM) and that they can use it to anonymously report concerns of GBV or VAC incidents.

Staff are encouraged to report suspected or actual GBV or VAC through the GRM by raising awareness about GBV and VAC issues, emphasizing the staff’s responsibility to the Company and the country hosting their employment, and emphasizing the respect for confidentiality.

In compliance with applicable laws and to the best of your abilities, prevent perpetrators of sexual exploitation and abuse from being hired, re-hired or deployed. Use background and criminal reference checks for all employees.

Ensure that when engaging in partnership, sub-contractor or similar agreements, these agreements: Incorporate the GBV and VAC Codes of Conduct as an attachment.

Include the appropriate language requiring such contracting entities and individuals, and their employees and volunteers, to comply with the Individual Codes of Conduct.

expressly state that the failure of those entities or individuals, as appropriate, to take preventive measures against GBV and VAC, to investigate allegations thereof, or to take corrective actions when GBV or VAC has occurred, shall constitute grounds for sanctions and penalties in accordance with the Individual Codes of Conduct.

Provide support and resources to the GCCT to create and disseminate internal sensitization initiatives through the awareness-raising strategy under the Action Plan.

Ensure that any GBV or VAC issue warranting police action is reported to the client and the World Bank immediately.

Training

All managers are required to attend an induction manager training course prior to commencing work on site to ensure that they are familiar with their roles and responsibilities in upholding the GBV and VAC Codes of Conduct. This training will be separate from the induction training course required of all employees and will provide managers with the necessary understanding and

technical support needed to begin to develop the Action Plan for addressing GBV and VAC issues. Ensure that time is provided during work hours and that staff attend the mandatory project facilitated induction training on GBV and VAC required of all employees prior to commencing work on site.

Ensure that staff attend the monthly mandatory refresher training course required of all employees to combat increased risk of GBV and VAC during civil works.

Managers are required to attend and assist with the project facilitated monthly training courses for all employees. Managers will be required to introduce the trainings and announce the selfevaluations.

Collect satisfaction surveys to evaluate training experiences and provide advice on improving the effectiveness of training. Response

Managers will be required to provide input to the GBV and VAC Allegation Procedures and Response Protocol developed by the GCCT as part of the final cleared Action Plan.

Once adopted by the Company, managers will uphold the Accountability Measures set forth in the Action Plan to maintain the confidentiality of all employees who report or (allegedly) perpetrate incidences of GBV and VAC (unless a breach of confidentiality is required to protect persons or property from serious harm or where required by law).

If a manager develops concerns or suspicions regarding any form of GBV or VAC by one of his/her direct reports, or by an employee working for another contractor on the same work site, s/he is required to report the case using the GRM.

Once a sanction has been determined, the relevant manager(s) is/are expected to be personally responsible for ensuring that the measure is effectively enforced, within a maximum timeframe of 14 days from the date on which the decision to sanction was made.

Managers failing to report or comply with such provision can in turn be subject to disciplinary measures, to be determined and enacted by the company's CEO, Managing Director or equivalent highest-ranking manager. Those measures may include:

Informal warning.

Formal warning.

Additional Training.

Loss of up to one week's salary.

Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.

Termination of employment.

Ultimately, failure to effectively respond to GBV and VAC cases on the work site by the company's managers or CEO may provide grounds for legal actions by authorities.

I do hereby acknowledge that I have read the foregoing Manager's Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to GBV and VAC. I understand that any action inconsistent with this Manager's Code of Conduct or failure to take action mandated by this Manager's Code of Conduct may result in disciplinary action.

Signature: _____

Printed Name: _____ Title: _____

Date: _____

Annex 9: Individual Code of Conduct on Preventing Gender Based Violence and Violence against Children

I, _____, acknowledge that preventing gender-based violence (GBV) and violence against children (VAC) is important. The company considers that GBV or VAC activities constitute acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of employment. All forms of GBV or VAC are unacceptable be it on the work site, the work site surroundings, or at worker’s camps. Prosecution of those who commit GBV or VAC may be pursued if appropriate.

I agree that while working on the project I will:

Consent to police background check.

Treat women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status.

Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.

Not participate in sexual contact or activity with children—including grooming or contact through digital media. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.

Not engage in sexual favors—for instance, making promises or favorable treatment dependent on sexual acts—or other forms of humiliating, degrading or exploitative behavior.

Unless there is the full consent⁶ by all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex—such sexual activity is considered “non-consensual” within the scope of this Code.

Attend and actively partake in training courses related to HIV/AIDS, GBV and VAC as requested by my employer.

Consider reporting through the GRM or to my manager any suspected or actual GBV or VAC by a fellow worker, whether employed by my company or not, or any breaches of this Code of Conduct.

With regard to children under the age of 18:

Wherever possible, ensure that another adult is present when working in the proximity of children. Not invite unaccompanied children unrelated to my family into my home, unless they are at immediate risk of injury or in physical danger.

Not sleep close to unsupervised children unless absolutely necessary, in which case I must obtain my supervisor's permission, and ensure that another adult is present if possible.

Use any computers, mobile phones, or video and digital cameras appropriately, and never to exploit or harass children or to access child pornography through any medium (see also “Use of children's images for work related purposes” below).

Refrain from physical punishment or discipline of children.

Refrain from hiring children for domestic or other labor which is inappropriate given their age or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.

⁶ Consent is defined as the informed choice underlying an individual’s free and voluntary intention, acceptance or agreement to do something. No consent can be found when such acceptance or agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of

18, even in the event that national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defense.

Comply with all relevant local legislation, including labor laws in relation to child labor.

Use of children's images for work related purposes

When photographing or filming a child for work related purposes, I must:

Before photographing or filming a child, assess and endeavor to comply with local traditions or restrictions for reproducing personal images.

Before photographing or filming a child, obtain informed consent from the child and a parent or guardian of the child. As part of this I must explain how the photograph or film will be used. Ensure photographs, films, videos and DVDs present children in a dignified and respectful manner and not in a vulnerable or submissive manner. Children should be adequately clothed and not in poses that could be seen as sexually suggestive.

Ensure images are honest representations of the context and the facts.

Ensure file labels do not reveal identifying information about a child when sending images electronically.

Sanctions

I understand that if I breach this Individual Code of Conduct, my employer will take disciplinary action which could include:

Informal warning.

Formal warning.

Additional Training.

Loss of up to one week's salary.

Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.

Termination of employment.

Report to the police if warranted.

I understand that it is my responsibility to avoid actions or behaviors that could be construed as GBV or VAC or breach this Individual Code of Conduct. I do hereby acknowledge that I have read the foregoing Individual Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to GBV and VAC. I understand that any action inconsistent with this Individual Code of Conduct or failure to take action mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Annex 10: Waste Management Plan

1. All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing materials and other hazardous chemicals shall be enclosed in a bund wall in order to contain spillage. All waste containers, litter and any other waste generated during the construction shall be collected and disposed of at designated disposal sites in line with applicable government waste management regulations.
2. All drainage and effluent from storage areas, workshops shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations.
3. Used oil from maintenance shall be collected and disposed off appropriately at designated sites or be re-used or sold for re-use locally.
4. Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.
5. Construction waste shall not be left in stockpiles along the road, but removed and reused or disposed of on a daily basis.
6. If disposal sites for clean spoil are necessary, they shall be located in areas, approved by the ACENPEE centre PIU, of low land use value and where they will not result in material being easily washed into drainage channels. Whenever possible, spoil materials shall be placed in low-lying areas and shall be compacted and planted with species indigenous to the locality.

Disposal of Unusable Elements

7. Unusable materials and construction elements such as electro-mechanical equipment, pipes, accessories and demolished structures will be disposed of in a manner approved by the PIU. The Contractor has to agree with the PIU which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.
8. As far as possible, abandoned pipelines shall remain in place. Where for any reason no alternative alignment for the new pipeline is possible, the old pipes shall be safely removed and stored at a safe place to be agreed upon with the PIU and the local authorities concerned.
9. AC-pipes as well as broken parts thereof have to be treated as hazardous material and disposed of as specified above.
10. Unsuitable and demolished elements shall be dismantled to a size fitting on ordinary trucks for transport.

Annex 11: Workers Campsite Management Plan

As an operator or manager of Temporary Worker Housing (TWH), Contractors need to have a Camp Management Plan (plan) for your TWH facility(s). The plan is to assure that the temporary housing is operated in a safe and secure manner and is kept within its approved capacity.

All occupants of the Camp must be aware of the Camp Management Plan in a language the occupant understands. Furthermore, it is a requirement to provide individual copies of it to each occupant or post the plan in the housing area for the occupants to see.

For licensing purposes, the Contractor will need to provide a copy of your Camp Management Plan to the PP&MS so that their Inspection staff will verify that compliance of engagement of occupants of camp with awareness of the Camp Management Plan during occupancy inspections.

A template for the plan is provided hereunder. The template provides the four essential parts to be cover in the plan.

Four Essential Parts Needed in Your Plan

Planning

Explain how you will maintain a safe site. Describe how you ensure security on-site, and describe how you ensure camp occupants can get immediate medical attention and other emergency services. Please submit descriptions to the department.

Emergency Contact Information

Provide emergency contact and location information, including how to get a hold of the owner/manager. Important contacts are listed in the template. Please fill in the needed information or create your own list. Remember to provide emergency procedures in case of fire, earthquake, or serious injury. Include others as appropriate.

Fees/Charges

Include information about any fees or charges required of the occupants to stay in your temporary worker housing.

Camp Rules

Include camp rules in your Camp Management Plan. Let the list of rules provided in the template serve as examples. Please add and subtract rules as you need for your camp. provide information in formats acceptable for people with disabilities, on request.

Camp Management Plan	
These are the rules for living in this camp. The rules are for your protection and are intended to help you live in a safe place. Each person must follow the rules or they may be asked to leave.	
Emergency Contact Information	
Camp Owner/Manager Name:	Phone:
Camp Address:	City:
Police Phone:	Ambulance Phone:
Clinic Address:	Phone:
Hospital Address:	Phone:
First Aid Trained Name:	How to contact:
First aid supplies are located at:	

State Health Department Address:

Phone:

Housing Complaints:

State Department of Health

Phone:

Emergency Procedures:

In case of fire, do this:

In case of earthquake, do this:

Note: An emergency escape map/plan is posted in each building or sleeping area. If missing, notify the owner/manager.

Camp Fees

Charges for staying in the camp (if applicable) are:

Rent ₦

per month

per week

Utilities: ₦

per month

per week

Damage Deposit: ₦

Other Charges: ₦

Camp Rules

Do not overcrowd the housing. The maximum number of people allowed to stay in the camp is:

Report problems – sickness, drinking water quality, or gas fumes and odor – to the owner/manager.

Know your exit routes, keep them clear and unobstructed, report any exit routes that do not open.

Do not alter or remove batteries from smoke detectors, or repair electrical wiring or devices.

Report to owner/manager any equipment or items that do not operate or are broken; e.g. stoves, heaters, hot water, air conditioning, laundry, toilets, broken septic, windows, leaks, drains.

Do not damage the camp, its equipment, or contents.

Put all garbage in proper containers and put the lids back on the containers.

Flush all used toilet paper down the toilet.

No fighting, alcohol, firearms, or other illegal activities.

No keeping livestock in the dwelling units or in the housing area.

No storing toxic or hazardous materials in the camp and report any to the owner/manager.

Keep cook areas clean, and food in proper storage containers to prevent mice and insect damage.

Laundry facilities are for camp occupant use only.

Do not change your car oil here. You can change your car oil at:

Do not move beds.

No unauthorized persons are allowed. Report unauthorized or suspicious people to owner/manager.

Follow camp hours for arriving

and leaving

and guests must leave by

No loud noises before

a.m. or after

p.m.

Each person must follow the rules or they may be asked to leave.

Annex 12: Safeguard Guidance on Covid-19 Consideration In Construction/Civil Works Projects

Some of the COVID-19 guidelines are:

This generic guidance provides a guide for this project on adequate precautions to prevent and/or minimize an outbreak of COVID 19, and actions to take in the event of such an outbreak.

Suggestions on how to do this are set out below:

- The PIU, either directly or through the Supervising Engineer, should request details in writing from the main Contractor of the measures being taken to manage covid19 related risks.
- The PIU should require the Contractor to convene regular meetings with the project health and safety specialists and medical staff (and where appropriate the local health authorities), and to take their advice in designing and implementing any agreed measures.
- Where possible, a senior person should be identified as a focal point to deal with COVID-19 issues. This can be a work supervisor or a health and safety specialist. This person can be responsible for coordinating preparation of the site and making sure that the measures taken are communicated to the workers, those entering the site and the local community. It is also advisable to designate at least one back-up person; in case the focal point becomes ill; that person should be aware of the arrangements that are in place.

Workers should be encouraged to use the existing project grievance mechanism to report concerns relating to COVID-19, preparations being made by the project

These guidelines will be communicated to general labour workforce during staff trainings & toolbox meetings to ensure that all employees are aware of steps to take regarding COVID19:

Protect yourself and those around you:

- Keep physical distance of at least 1 metre from others, even if they don't appear to be sick. Avoid crowds and close contact.
- Wear a properly fitted mask when physical distancing is not possible and in poorly ventilated settings.
- Clean your hands frequently with alcohol-based hand rub or soap and water.
- Cover your mouth and nose with a bent elbow or tissue when you cough or sneeze. Dispose of used tissues immediately and clean hands regularly.
- If you develop symptoms or test positive for COVID-19, self-isolate until you recover.

Make your environment safer

The risks of getting COVID-19 are higher in crowded and inadequately ventilated spaces where infected people spend long periods of time together in close proximity.

Outbreaks have been reported in places where people have gathered, often in crowded indoor settings and where they talk loudly, shout, breathe heavily or sing such as restaurants, choir practices, fitness classes, nightclubs, offices and places of worship. To make your environment as safe as possible:

- Avoid the 3Cs: spaces that are closed, crowded or involve close contact.
- Meet people outside. Outdoor gatherings are safer than indoor ones, particularly if indoor spaces are small and without outdoor air coming in.
- If you can't avoid crowded or indoor settings, take these precautions:

- Open a window to increase the amount of natural ventilation when indoors.
- Wear a mask (see above for more details).

Keep good hygiene

By following good respiratory hygiene, you protect the people around you from viruses that cause colds, flu and COVID-19.

To ensure good hygiene you should:

- Regularly and thoroughly clean your hands with either an alcohol-based hand rub or soap and water. This eliminates germs that may be on your hands, including viruses.
- Cover your mouth and nose with your bent elbow or a tissue when you cough or sneeze. Dispose of the used tissue immediately into a closed bin and wash your hands.
- Clean and disinfect surfaces frequently, especially those which are regularly touched, such as door handles, faucets and phone screens.

What to do if you feel unwell

If you feel unwell, here’s what to do.

- If you have a fever, cough and difficulty breathing, seek medical attention immediately. Call by telephone first and follow the directions of your local health authority.
- Know the full range of symptoms of COVID-19. The most common symptoms of COVID-19 are fever, dry cough, tiredness and loss of taste or smell. Less common symptoms include aches and pains, headache, sore throat, red or irritated eyes, diarrhoea, a skin rash or discoloration of fingers or toes.
- Stay home and self-isolate for 10 days from symptom onset, plus three days after symptoms cease. Call your health care provider or hotline for advice. Have someone bring you supplies. If you need to leave your house or have someone near you, wear a properly fitted mask to avoid infecting others.
- Keep up to date on the latest information from trusted sources, such as WHO or your local and national health authorities. Local and national authorities and public health units are best placed to advise on what people in your area should be doing to protect themselves.

COVID-19 PREPAREDNESS REPORT TEMPLATE

COVID-19 RESPONSE report should follow the template format provided below. Make sure to provide breakdown between different sub-projects, construction sites and/or contractors. Analyze discrepancies and assess their causes, as well as necessary adjustments.

Refer to guidance documents provided above – COVID-19 Considerations on Construction Civil Works documents (Guidance for Borrower and Guidance for Contractor), Advisory Note on Contingency Planning for existing operations – for examples of mitigation measures/practices for COVID-19 spread prevention/containment etc.

GENERAL INFORMATION
Name of the project/sub-project, Date of the report
Provide identifying information
Requirements/guidance on COVID-19 protection issued by the state authority of all levels

Provide information of legal framework on the issue, the date it became effective, both on national, regional and local (community) level

Brief description of activities/sub-projects which are active, stalled or partially active

Describe level of activity for each project/sub-project (PIU is operational in Client's premises; ongoing civil works on sites, etc.), as well as types of civil works (if ongoing) and number of workers on each site separately and for each sub-project/contractor collectively

(a) ASSESSING WORKFORCE CHARACTERISTICS

Information on workers accommodation

For each sub-project/contractor, provide information on how many workers live in workers camps, how many live in residential accommodations, hotels, etc.; how many live in their own private residences.

Transportation to/from work sites and for other work-related reasons

If workers need to commute to/from work sites from the place of residence, specify the type of transportation (public transport, own vehicle, arranged transportation by the Employer, etc.)

COVID-19 PREPAREDNESS/RESPONSE MEASURES

(b) Entry/exit to the work site and checks on commencement of work

Describe measures taken to secure entrance procedure and medical checks.

(c) General hygiene

Describe what are requirements on general hygiene applied for project-related workforce (both PIU and project workers) and how these requirements are communicated

(d) Cleaning and waste disposal

Provide review of cleaning protocols (including disinfection) for all site facilities, including offices, accommodation, canteens, common spaces, as well as key construction equipment.

(e) Adjusting work practices

Describe what changes to work processes and timings have been done to reduce or minimize contact between workers

(f) Project medical services

Provide assessment whether existing project medical services on site are adequate, taking into account existing infrastructure (size of medical post, number of beds, isolation facilities), medical staff, equipment and supplies, procedures and training. If not, describe what measures have been taken to upgrade.

(g) Local medical and other services

Provide overview of resources and capacity of local medical services, what procedure is established for the event of ill workers needing to be referred. Availability of health facility nearby to refer the patient and agreement between the Contractor and the facility.

(h) Instances or spread of the virus

Describe what is planned to be done to treat a person who becomes sick or displays symptoms that could be associated with the COVID-19 virus

(i) Continuity of supplies and project activities

Assess if COVID-19 restriction will impact supply chains and what arrangement are in place to secure continuity of operation. Specify critical supplies.

(j) CONTINGENCY PLANNING FOR AN OUTBREAK

Measures to address COVID-19 may be presented in different ways – as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures. Describe, how such measures are presented for each individual sub-project/contractor and when such plan/procedures came into force.

AWARENESS AND COMMUNICATION

(k) Training and communication with workers

Workers should be made aware of the procedures that have been put in place by the project, and their own responsibilities in implementing those procedures. Provide description of awareness/preparedness building exercises (issue of specific work instructions, public announcements on medical check-ins procedures, access to health care Centre, etc.) for workforce.

(l) Communication and contact with the community

The community may be concerned about the presence of non-local workers, or the risks posed to the community by local workers presence on the project site. Describe risk-based procedures to be followed for communication with local community stakeholders.

Grievance Redress Mechanism

Project-related GRM log needs to include additional column monitoring COVID-19 related complains/reports/grievances. Provide an update on number of COVID-related GRM log entries since last regular report.

(m) COVID-19 REPORTING

Number of COVID-19 cases – confirmed and suspected/under investigation

Provide information on project-related employees who are confirmed or suspected of being infected with COVID-19 virus: number, date of isolation, severity of the case. **No private information should be provided!**

Reporting arrangements

Outbreaks of diseases must be reported. PIU/Contractor should report an outbreak following the guidance in herein for a ‘Serious’ incident. Borrower must be informed of any concerns or problems associated with providing care to infected workers on project sites, particularly if infection rate is approaching 50% of the workforce.

Confirm, that these reporting requirements are accepted by the relevant/responsible staff within PIU/Contractor’s organizational structure.

ANNEX 13: Cultural and Physical Resources Management Plan

The contractor(s) shall implement the following cultural resources plan.

- Carry out sensitization and capacity building on identification, management and reporting of cultural and physical resources including chance find.
- Integrate the process of cultural and physical resources management plan with the HSE mechanism
- Build the capacity of both Field/HSE personnel for cultural and physical resource management, chance find and reporting protocols.
- Avoid activities around known cultural and physical resources such as shrines, grooves, burial sites/cemetery etc.
- Clearly mark the boundaries of identified site from project and create appropriate buffer for the protection and possibly design and erect signages for awareness.
- Keep record of such cultural and physical resources (including names, address, geographic location, maps)
- Keep equipment away from such resources
- Site office and general operational areas should not be located close to such resources.
- Ensure appropriate measures are taking to prevent or reduce soil disturbance around such cultural and physical resources area.

Chance Find Plan (for Cultural and Physical Resources)

- Avoid further work in such area
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and Bureau of Art and Culture take over;
- Report chance find to the local community, PIU and authorities (LGA and Kaduna State Ministry of Culture and Tourism)
- Mark and protect such areas for restrictions
- Implementation for the authority decision concerning the management of the finding shall be communicated in writing by Kaduna State Ministry of Culture and Tourism
- These procedures must be referred to as standard provisions in construction contracts, when applicable, during project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered are observed.
- Relevant findings will be recorded in World Bank Project Supervision Reports (PSRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.
- Construction work could resume only after permission is given from the responsible Local Government, Kaduna State Ministry of Culture and Tourism concerning safeguard of the heritage
- **Monitoring**
Physical monitoring of sites of cultural heritage will require synergized involvement attention by several relevant state and national agencies e.g. State Ministry for Culture and Tourism.

ANNEX 14: ACENPEE Documentation of Allocation of Land & Resettlement Plans for The Encumbered Part

PHYSICAL PLANNING & MUNICIPAL SERVICES
AHMADU BELLO UNIVERSITY,
ZARIA, NIGERIA

VICE-CHANCELLOR: Kabir Bala, B.Sc (Hons) Building, M.Sc (Bldg.Serv), MBA Ph.D. (Construction Mgt) (ABU), FNAOR, MAPM, MCABE, C.Bldg
ENGINEER. Telegram: UNIBELLO ZARIA e-Mail: pp&ms@abu.edu.ng Telephone: 0803781862
Ag. DIRECTOR: Arc. Sulaiman Mohammed, Bsc.Msc (Arch) ABU, MNLS, ARCONS Regd. Arch.

PP&MS/DC/22 9th December, 2022

The Director,
Africa Centre of Excellence on New
Pedagogies in Engineering Education,
Ahmadu Bello University,
Zaria.

Dear Sir,

RE: REQUEST FOR ALLOCATION OF LAND FOR ACENPEE BUILDING

I write to convey the Vice Chancellor's approval for the allocation of space at Engineering Phase III for the construction of the Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE).

Please liaise with Physical Planning and Municipal Services Department before commencement of works in order to ensure compliance with development control.

Thank you.

Yours sincerely,



Arc. Sulaiman Mohammed
Ag. Director: PP&MS



NOTICE	
ALL DIMENSIONS ARE IN METERS	
GENERAL NOTES	
1. THIS PLAN IS FOR THE PROPOSED DEVELOPMENT OF THE SITE AS SHOWN ON THE ATTACHED SITE PLAN. ALL DIMENSIONS ARE IN METERS.	
PROJECT DATA	
PROJECT NO.	ARC. 2023/001
CLIENT	DR. GEORGE A. KOUSSIS
ADDRESS	101, ARABIAN BAY
DATE OF PLAN	2023/12/01
SCALE	1:500
DATE	DEC. 2023



AHMADU BELLO UNIVERSITY
ZARIA, NIGERIA.
OFFICE OF THE VICE-CHANCELLOR

Vice - Chancellor: Professor Kabiru Bala, BA (Hons) (Eng), MSc (Eng Sci), MEd, PhD (Eng. Mg.) (MS), FRCOE, MFRM, MCAE, C. Eng. E. MCAE

VC/ORG/152

12th December 2022

The Dean,
Students Affairs Directorate,
Ahmadu Bello University,
Zaria.

**RE-ALLOCATION OF STUDENTS CURRENTLY OCCUPYING THE
SASAKAWA HOSTEL IN ENGINEERING PHASE III**

As you may be aware, part of the Engineering Phase III land has been allocated to African Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE) for the construction of their Centre building. The Sasakawa hostel is within the space allocated for this purpose.

Please arrange for the reallocation of the students currently residing in the hostel to the Akenzua postgraduate hostel. Also, you are to inform the students that they will be re-allocated by the end of first semester in April, 2023.

Thank you.

Yours faithfully,


Prof. Kabiru Bala

Vice Chancellor

Cc: Centre Director, ACENPEE

Director, Physical Planning and Municipal Services



AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA
Vice - Chancellor's Office
(STUDENT AFFAIRS DIVISION)

Vice Chancellor: Professor Kabir Bala, B.Sc. (Hons) (Building), M.Sc. (Bldg. Desig), MBA, Ph.D. (Comm. Mgt.) (ABU), FRIBA, MIPM, MCASE, C. Eng, E. MCIMB
Dean: Professor Muhammad Yakasai Fatihu, DVM, MSc, PhD (ABU) FCVDF

14th December, 2022

To: Students occupying Sasakawa Hostel,
Engineering Phase III,
Ahmadu Bello University,
Zaria.

NOTICE OF REALLOCATION OF STUDENTS CURRENTLY OCCUPYING THE SASAKAWA HOSTEL IN ENGINEERING PHASE III

Part of the Engineering Phase III land has been allocated to African Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE) for the construction of their Centre building. Sasakawa falls within the space allocated for this purpose.

You are hereby notified that you will be re-allocated to other postgraduate hostels at Akenzua and Dangote halls.

Thank you.

Prof. Muhammad Yakasai Fatihu
Dean, Students Affairs

cc: Sasakawa Hall Administrator
Centre Director, ACENPEE

ANNEX 15: ESMP Questionnaire

QUESTIONNAIRE FOR ESMP OF THE PROPOSED CONSTRUCTION OF AFRICA CENTRE OF EXCELLENCE ON NEW PEDAGOGIES IN ENGINEERING EDUCATION ACENPEE ABU, ZARIA.

RESPONDENT'S INFORMATION

1. Name:
.....
2. Faculty/Department:
.....
3. Phone Number:
.....
4. Do you live/work in ABU? Yes () No ()
5. If yes, how long have you lived/worked here?.....
6. Do you live in university house or hostels? Yes () No ()
7. How old are you now?
(i) 0-10 years (ii) 11-20 years (iii) 21-30 years (iv) 31-40 years (v) Above 40 years
8. Sex: Male () Female ()
9. Marital Status
(i) Married () (ii) Single () (iii) Divorced () (iv) Widowed ()
10. Religious affiliation: (i) Muslim () (ii) Traditional () (iii) Christianity ()
11. Level of education (i) None () (ii) Primary () (iii) Secondary () (iv) Post-Secondary () (v) Quranic education () (vi) Others (specify) ()
12. What is the view of population of the inhabitant in the neighbour / each house?
1 – 5 [] 6 – 10 [] 11 – 15 [] 16 - 20 [] above 20 []
13. Is there traffic congestion in this area? Yes () No ()
14. When time do you experience traffic congestion in these areas?
6am – 10am [] 11am – 3pm [] 4pm – 8pm [] 9pm – 12am []
15. What type of waste is generated in this area?
16. what is your observation of waste disposal in this environment?
Dump site [] Dropping at the side of the road [] pick up by waste management authority [] Burning []
17. Is your waste sorted? Y / N

18. How frequently do you dispose your waste? Daily [] weekly [] monthly []
19. Who is responsible for your waste collection? Self-disposal [] Waste pickers []
waste management authority []
20. What is the source of your water in this environment?
Pipe- borne water [] bore-hole [] hand dug deep well [] river or stream/spring []
Stored rain water []
21. Are there any local animals around this area? Y / N
If Yes, please specify
22. Are there any pedestrian safety signs around the area? Y / N
If Yes, please specify
23. Have there been any accident issue within the area? Y / N
If Yes, please describe
24. Is there any issue related to noise and air pollution in the area? Y / N
If Yes, please describe
25. Is there flood or erosion issues in this area? Y/N
26. Is there any issue with informal traders in this environment? Y/N
27. Are you aware of the construction work ongoing in the neighbourhood? Y/ N
28. what impact do envisage the construction can have on your work? state
them.....
.....
29. what impact do you envisage the construction can have on your environment? state
them-----

30. Are there any concerns you have with the construction site? Y/N
If yes, please state them
31. Are there any concerns with the research centres program in this area? Y/N
If yes please state them
32. Are there any concerns with gender-based violence in this area? Y/N