Environmental and Social Impact Assessment for PHC Facilities

Lagos State Health Infrastructure Project (LSHIP)

Badagry Axis (Group 8)

By

Lagos State Ministry of Health (LSMoH)
Project Implementation Unit (PIU)

Submitted to

Federal Ministry of Environment (FMEnv)

Abuja, Nigeria

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This Document Information Matrix

Environmental and Social Impact Assessment for Lagos State Health Infrastructure Project (LSHIP) Group 8 Badagry Axis

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Consultant Certification

This ESIA Report for the Lagos State Health Infrastructure Project (LSHIP) Badagry Axis (Group 8) has been prepared by Multiple Development Services Ltd. (MDS), supported by Natural Eco Capital, in accordance with:

- The Environmental Impact Assessment Act No. 86 of 1992 (as amended)
- FMEnv Sectoral Guidelines for Health Facilities
- Lagos State Environmental Protection Agency (LASEPA) regulations
- African Development Bank (AfDB) Integrated Safeguards System (ISS, 2024)

We hereby certify that:

1. The ESIA was conducted using accepted scientific, environmental, and social assessment methodologies.
2. Field data collection, stakeholder engagement, and baseline studies were carried out in accordance with FMEnv requirements.
3. All information presented is accurate to the best of our knowledge and based on data obtained during fieldwork, consultations, and technical analysis.

Lead ESIA Expert:

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FMEnv Registration No.: _____

Signature: _____

Date: _____

Firm Representative (MDS):

Name: _____ *Designation:* _____ *Signature:* _____ *Date:* _____

Disclaimer / Caveat

This Environmental and Social Impact Assessment (ESIA) Report for the Lagos State Health Infrastructure Project (LSHIP) Badagry Axis (Group 8) is issued as a Draft for Review.

The contents of this document are not final and shall not be cited, distributed, or used for regulatory approval until all comments from the Federal Ministry of Environment (FMEnv), Lagos State Environmental Protection Agency (LASEPA), African Development Bank (AfDB), and relevant stakeholders have been fully incorporated.

All findings, assessments, baseline data, and recommendations contained herein are subject to modification following:

- Regulatory review and directives
- Stakeholder consultations
- Additional field sampling and laboratory analysis
- Technical validation by the Project Implementation Unit (PIU)

The Lagos State Ministry of Health (LSMoH) and its Project Implementation Unit (PIU) accept no liability for any use of this draft report outside the formal review process.

A final ESIA will be issued only after completion of the mandatory 120-day public disclosure period required for AfDB Category 1 projects and subsequent FMEnv approval.

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The PIU appreciates the cooperation of all stakeholders whose contributions have strengthened the environmental and social integrity of this ESIA.

A Final Note of Appreciation

This ESIA represents a collective effort to ensure that the Lagos State Health Infrastructure Project (LSHIP) delivers safe, climate-resilient, and socially responsible healthcare infrastructure for the communities of Agbowa, Ejirin, Solu-Alade, and Orimedu. The commitment of all stakeholders – from federal and state regulators to local communities – is deeply appreciated.

Any errors or omissions in this report are solely the responsibility of the preparers.

This document is issued as a Draft for Review. It is not a final ESIA and should not be cited, distributed, or used for regulatory approval. All findings, assessments, and recommendations are subject to modification based on stakeholder feedback, regulatory comments, and further technical validation.

Lagos State Ministry of Health (LSMoH)

Project Implementation Unit (PIU)

Alausa Secretariat, Ikeja, Lagos State

Federal Republic of Nigeria

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Abbreviations List

Abbreviation	Definition
ACM	Asbestos-Containing Material
AADT	Annual Average Daily Traffic
AfDB	African Development Bank
APHA	American Public Health Association
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BSL	Biosafety Level
BTOR	Back-to-Office Report
CASHES	Community Affairs, Safety, Health, Environment and Security
CEC	Cation Exchange Capacity
CESMP	Contractor Environmental and Social Management Plan
CFU	Colony-Forming Unit
CHEW	Community Health Extension Worker
CIZ	Cumulative Influence Zone
CoC	Code of Conduct / Chain of Custody
COD	Chemical Oxygen Demand
CRM	Certified Reference Material
DAI	Direct Area of Influence
DO	Dissolved Oxygen
DPC	Damp Proof Course
E&S	Environmental and Social
EC	Electrical Conductivity
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMR	Electronic Medical Record

EPRP	Emergency Preparedness and Response Plan
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
FGD	Focus Group Discussion
FFL	Finished Floor Level
FMEnv	Federal Ministry of Environment
FPIC	Free, Prior and Informed Consent
GBV	Gender-Based Violence
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning System
GRM	Grievance Redress Mechanism
HAI	Healthcare-Associated Infection
HEFAMAA	Health Facility Monitoring and Accreditation Agency
HEPA	High-Efficiency Particulate Air
HIRA	Hazard Identification and Risk Assessment
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
HMWMP	Hazardous and Medical Waste Management Plan
HRDD	Human Rights Due Diligence
HRIA	Human Rights Impact Assessment
HSE	Health, Safety and Environment
IAI	Indirect Area of Influence
IBA	Important Bird Area
IDRI	Infectious Disease Research Institute
IEQ	Indoor Environmental Quality

IESM	Independent Environmental and Social Monitor
IFC	International Finance Corporation
ILO	International Labour Organization
IPC	Infection Prevention and Control
IPCC	Intergovernmental Panel on Climate Change
ISS	Integrated Safeguards System
IUCN	International Union for Conservation of Nature
KII	Key Informant Interview
KPI	Key Performance Indicator
LASEPA	Lagos State Environmental Protection Agency
LASG	Lagos State Government
LASM	Lagos State Museum
LASODA	Lagos State Office for Disability Affairs
LASWARCO	Lagos State Water Regulatory Commission
LAWMA	Lagos State Waste Management Authority
LCDA	Local Council Development Area
LGA	Local Government Area
LSHIP	Lagos State Health Infrastructure Project
LOS	Level of Service
LOTO	Lockout/Tagout
LSDP	Lagos State Development Plan
LSMoH	Lagos State Ministry of Health
LTI	Lost-Time Injury
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health
MDS	Multiple Development Services
MEP	Mechanical, Electrical, and Plumbing

MIRA	Mirabel Centre
MOU	Memorandum of Understanding
NBMA	National Biosafety Management Agency
NCDC	Nigeria Centre for Disease Control
NDC	Nationally Determined Contribution
NESREA	National Environmental Standards and Regulations Enforcement Agency
NGN	Nigerian Naira
NGSA	Nigerian Geological Survey Agency
NHMIS	National Health Management Information System
NIMET	Nigerian Meteorological Agency
NIOMR	Nigerian Institute for Oceanography and Marine Research
NOSDRA	National Oil Spill Detection and Response Agency
NPHCDA	National Primary Health Care Development Agency
NPK	Nitrogen, Phosphorus, Potassium
NTU	Nephelometric Turbidity Unit
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
OS	Operational Safeguard
PAH	Polycyclic Aromatic Hydrocarbon
PAP	Project Affected Person
PCM	Phase Contrast Microscopy
PEP	Post-Exposure Prophylaxis
PHC	Primary Healthcare Centre
PHCB	Primary Healthcare Board
PIU	Project Implementation Unit
PLC	Portland Limestone Cement
PM	Particulate Matter

PPE	Personal Protective Equipment
PPP	Public-Private Partnership
PPV	Peak Particle Velocity
PS	Performance Standard
PSP	Private Sector Participation
PTSD	Post-Traumatic Stress Disorder
PV	Photovoltaic
PWD	Person with Disability
QA/QC	Quality Assurance / Quality Control
RAP	Resettlement Action Plan
RCP	Representative Concentration Pathway
RO	Reverse Osmosis
SDG	Sustainable Development Goal
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SH	Sexual Harassment
SRI	Solar Reflectance Index
SRTM	Shuttle Radar Topography Mission
STI	Sexually Transmitted Infection
SWP	Safe Work Procedure
TCFD	Task Force on Climate-related Financial Disclosures
TDS	Total Dissolved Solids
TEM	Transmission Electron Microscopy
TMP	Traffic Management Plan
TPC	Total Plate Count
TPH	Total Petroleum Hydrocarbon
TSS	Total Suspended Solids

UHC	Universal Health Coverage
UNGPs	United Nations Guiding Principles on Business and Human Rights
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VAPP	Violence Against Persons (Prohibition) Act
VOC	Volatile Organic Compound
VPSHR	Voluntary Principles on Security and Human Rights
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization
WGS84	World Geodetic System 1984

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EXECUTIVE SUMMARY

ES.1 Project Background and Purpose

ES.1.1 Project Overview

The Lagos State Ministry of Health (LSMoH), through its Project Implementation Unit (PIU), is implementing the Lagos State Health Infrastructure Project (LSHIP), a US$200 million health system strengthening programme financed by the African Development Bank (AfDB). The project focuses on modernizing healthcare infrastructure across Lagos State to address systemic challenges such as high maternal mortality and limited diagnostic capacity.

This Volume addresses the Badagry Axis (Group 8), which includes the refurbishment and revitalization of three Primary Healthcare Centres (PHCs) that serve geographically isolated and climate-vulnerable populations:

- Ibereko PHC (Badagry LGA, Olorunda LCDA)
- Gberefu PHC (Badagry LGA, Badagry Central)
- Agboyi PHC (Kosofe LGA, Agboyi-Ketu LCDA)

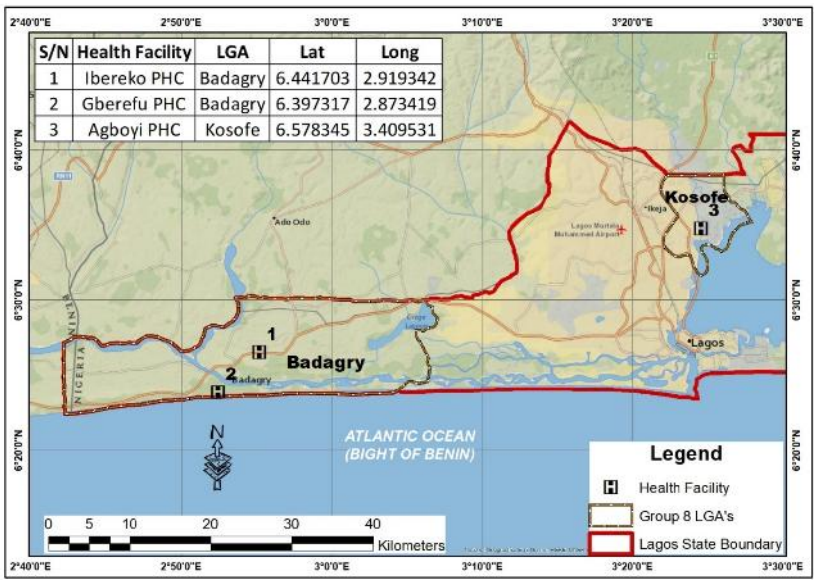


Figure ES1: Project Locations

ES.1.2 Project Rationale

The Badagry Axis Group 8 occupies the coastal lowland and riverine corridor along the Badagry Creek and Kosofe riverine systems, where communities depend principally on fishing, farming, and small-scale (including cross-border) trade. Existing health facilities are critically under-resourced:

- **Ibereko** sits in a zone affected by rising damp and structural distress with wall cracks.
- **Gberefu** has experienced severe dilapidation and physical abandonment, having been largely taken over by bats, reptiles, and thickets.
- **Agboyi** is located in an extreme fluvial flood-prone zone (water levels reaching up to 5 meters during peak flooding) with water-locked access via wooden canoes and notable gaps in all-weather motorable roads.
- Across the catchment, there are historical gaps in reliable power for cold chains, waste management, and secure infrastructure.

The project directly responds to these deficits by:

- Improving access to quality primary healthcare for low-income, fishing, and trading communities.
- Upgrading structural integrity (remediating rising damp and wall cracks), water supply, sanitation, and waste management systems.
- Designing out seasonal flood and climate risk (elevated floor slabs, flood-resistant electrical panels, and drainage upgrades).
- Ensuring continuity of essential health services during and after construction.
- Strengthening climate resilience through green building design, natural ventilation, and solar-hybrid power systems.

ES.1.3 Project Classification

The Lagos State Health Infrastructure Project (LSHIP) is classified as:

- **AfDB Category 1 (High Risk)** under the Integrated Safeguards System (ISS) – requiring a full ESIA.
- **FMEnv Category I** under the EIA Act CAP E12 LFN 2004 – requiring a full ESIA.

This classification reflects the project's multi-site footprint, involuntary resettlement addressed through the axis RAP (at Agboyi), presence of hazardous materials (asbestos-suspected roofing structures at Ibereko and Gberefu), proximity to sensitive riverine,

wetland, and mangrove ecosystems (Likely Critical Habitats at Gberefu and Agboyi), and the scale of construction activities in economically vulnerable coastal and island communities.

ES.1.4 ESIA Objectives

The overarching objective of this ESIA is to serve as the principal due diligence instrument for the LSHIP in this axis. Specifically, this report:

- Establishes comprehensive baseline conditions for the three PHC sites (Ibereko, Gberefu, and Agboyi) across two LGAs (Badagry and Kosofe).
- Identifies and assesses all potential environmental and social impacts, including waterborne logistics risks and mangrove ecosystem disturbances.
- Develops clear, actionable, site-specific mitigation measures.
- Prepares safeguard instruments including the ESMP, HMWMP (featuring the Barge-to-Truck waste transfer protocol), GBV/SEA/SH Action Plan, and Asbestos Management Plan.
- Demonstrates full compliance with the AfDB ISS, FMEnv EIA Act, and international good practice standards.
- Supports informed decision-making by regulators, financiers, and stakeholders.

ES.1.5 Facility Typology and Scope of Assessment

The scope of this ESIA reflects both the AfDB Category 1 programme classification and the specific typology of the Group 8 facilities. While the Lagos State Health Infrastructure Project has been designated Category 1 due to its statewide footprint and cumulative considerations, the individual facilities assessed in this Group—Ibereko (refurbishment), Gberefu (refurbishment), and Agboyi (refurbishment)—are small Primary Healthcare Centres undergoing total revitalization with modest service footprints and basic infrastructure requirements.

These PHCs do not generate the scale or complexity of environmental pressures typically associated with general hospitals or large medical facilities. Accordingly, the baseline parameters and impact pathways relevant to these sites are inherently limited, and the level of analysis applied at the facility level is proportionate to their operational realities. The ESIA therefore maintains Category 1 rigour while tailoring the depth of assessment to the specific, context-appropriate risks associated with small rural and island PHCs undergoing structural refurbishment.

This ESIA has been prepared in accordance with AfDB's Integrated Safeguards System and is consistent with internationally recognised environmental assessment practices, ensuring that the analysis and documentation meet globally accepted technical standards.

ES.2 Project Description

ES.2.1 Project Components

Component	Description
New Construction / Major Works	One (1) major facility revitalization at Agboyi located within an extreme fluvial flood-prone zone (water levels reaching up to 5 meters during peak flooding) with water-locked access via wooden canoes, requiring elevated-platform designs and specialized logistical coordination.
Refurbishment	Two (2) existing PHCs (Ibereko and Gberefu) refurbished and expanded. Ibereko addresses structural distress (rising damp and wall cracks), while Gberefu addresses severe dilapidation and physical abandonment (remediation of overgrowth and vacant structural decay).
Infrastructure	Solar power systems, boreholes, septic tanks, small-scale non-burn medical waste treatment facilities, digital health infrastructure.
Access Improvements	Upgraded access pathways, water-transport docking facilities/ramps where applicable, and drainage within PHC premises to tackle water-logged environments.

ES.2.2 Design Features

All facilities incorporate climate-resilient green building design, including:

- Elevated platforms and flood-resistant designs at Agboyi to design out seasonal flood and high water-level risks.
- Solar power systems with battery storage (24–48 hours backup) to bridge reliable power gaps for cold chains.
- Rainwater harvesting integrated with borehole supply (programme standard).
- Cool roofs and natural ventilation to mitigate high coastal temperatures and rising damp.
- Disability-friendly design (ramps, wide doorways, accessible toilets).
- Oversized drainage designed for the 1:100-year storm + 30% climate factor.

ES.2.3 Project Phases

Phase	Duration	Key Activities
Pre-construction	6–12 months	RAP implementation (compensation at full replacement cost before any works, particularly concerning Agboyi), asbestos surveys (addressing suspected asbestos roofing at Ibereko and Gberefu), design, permitting, contractor procurement.
Construction	12–18 months per facility (staggered schedule)	Earthworks and elevated platform construction (Agboyi), building and retrofit works, asbestos safe-removal protocols, MEP installation, equipment installation.
Operation	50+ years	Routine outpatient, maternal/child health, immunization, basic laboratory services, and sustainable medical waste management via small-scale non-burn systems.

ES.2.4 Project Resources

Resource	Estimated Quantity	Sourcing
Labour (peak)	85–105 workers (staggered per facility)	≥50% local hiring (within Kosofe, Badagry, and respective local LCDAs)
Cement	4,500–6,000 bags (225–300 tonnes)	Local (≥ 60% local sourcing)
Sand and Gravel	1,200–1,500 m^3 (sand); 900–1,100 m^3 (gravel)	Local (≥ 80% local sourcing)
Steel	45–60 tonnes	Nigerian mills (≥ 40% local sourcing)
Concrete Blocks	60,000–150,000 blocks	Local (≥ 80% local sourcing)
Marine-Grade Roofing	2,200–2,800 m^2	Specialized regional manufacturers (suited for corrosive coastal and riverine air)
Solar Panels	120–150 panels	Imported
Batteries (Lithium-ion)	45 units	Imported
Water Tanks	250,000–350,000 litres	Local (plastic or concrete)

ES.3 Legal and Institutional Framework

ES.3.1 Nigerian Regulatory Framework

This ESIA complies with:

- **EIA Act Cap E12 LFN 2004** – Mandatory EIA for prescribed activities (Category I designation).
- **NESREA Regulations (2007–2021)** – Air quality, noise, water quality, sanitation, and waste control standards.
- **Harmful Waste Act Cap H1 LFN 2004** – Prohibits improper disposal of hazardous waste (addressing legacy asbestos at Ibereko and Gberefu).
- **Land Use Act Cap L5 LFN 2004** – Governs land acquisition and compensation structures.
- **Violence against Persons (Prohibition) Act 2015, Child Rights Act 2003, Labour Act 2004, and the Lagos State Domestic Violence Law 2007** – underpinning the GBV/SEA/SH framework.
- **Lagos State Environmental Laws** – LASEPA permits, LAWMA waste management (including specialized barge-to-truck protocols for riverine sites like Agboyi), physical planning approvals.

ES.3.2 AfDB Operational Safeguards (ISS)

Safeguard	Requirement	Project Compliance Action
OS1 – Environmental and Social Assessment	Full ESIA for Category 1 projects	This ESIA report
OS2 – Labour and Working Conditions	Worker protection, OHS, non-discrimination	Labour Management Plan, OHS Plan (including water safety protocols for riverine transit)
OS3 – Resource Efficiency and Pollution Prevention	Waste management, pollution control	HMWMP (non-burn treatment), wastewater management, creek discharge prevention
OS4 – Community Health, Safety and Security	Community safety, traffic management	Traffic Management Plan (including water transport/canoe logistics for Agboyi), EPRP

OS5 – Land Acquisition and Involuntary Resettlement	Compensation, livelihood restoration	Resettlement Action Plan addressing components across the axis (such as Agboyi) to ensure compensation at full replacement cost prior to works.
OS6 – Biodiversity and Ecosystem Services	Sensitive ecosystem screening, buffers	Riverine/creek buffers, sediment controls, protection of fragile mangrove/wetland interfaces near Agboyi and Gberefu
OS10 – Stakeholder Engagement and Information Disclosure	Public consultation, GRM, 120-day disclosure	SEP, tiered GRM, public disclosure

ES.3.3 International Standards

Where Nigerian law is silent or weaker, the following international standards are adopted:

- **IFC Performance Standards (PS1–PS8)** and EHS Guidelines.
- **WHO Safe Management of Wastes from Health-Care Activities (2014)**.
- **ILO Conventions** 155, 161, 187, and core labour standards.
- **Equator Principles IV (EP4)**.
- **UN Guiding Principles on Business and Human Rights (UNGPs)**.

ES.4 Baseline Environmental and Social Conditions

ES.4 Baseline Environmental and Social Conditions

ES.4.1 Physical Environment

Parameter	Description
Location & Topography	Agboyi, Ibereko, and Gberefu Axis – defined by low-lying coastal plain sands and hydromorphic clay soils. Gberefu is specifically characterized as a narrow barrier island.
Climate	Humid tropical coastal climate; marine-influenced; bimodal rainfall (1,500–1,800 mm/year); 26–35°C
Air Quality	PM10: 1.2-168.8 µg/m³; PM2.5: 4.1-116.7 µg/m³; – localized exceedance at Ibereko/Agboyi monitoring points; Gberefu within baseline limits
Noise	Daytime: 49.5-63.3 dB(A) – 56% of monitoring points exceed the 55 dB(A) guideline

Water Quality	Groundwater generally meets WHO/FMEnv standards; total coliform present at all sites; E. coli detected at Agboyi water interfaces
Geology	Coastal plain sands with clay intercalations; riverine/alluvial deposits; high-water table
Erosion Risk	High at Agboyi (fluvial bank erosion); medium at Ibereko and Gberefu (sandy and degraded soils)
Flood Risk	Agboyi functions as a natural floodplain with water levels reaching up to 5 meters during peak fluvial flooding; Gberefu is a narrow barrier island highly susceptible to storm surges; high risk at Ibereko requiring elevated-platform or drainage mitigation designs
Coastal Erosion/SLR	Gberefu and coastal-adjacent points identified among coastal-erosion/sea-level-rise high-risk zones

ES.4.2 Biological Environment

Aspect	**Findings**
Setting	Riverine, mangrove, and creek-margin ecosystems along the axis waterways; coastal and wetland vegetation
Sensitive Ecosystems & Critical Habitats	Both Gberefu and Agboyi are classified as "Likely Critical Habitat" due to the presence of red mangroves (Rhizophora racemosa) and sensitive riparian corridors serving as receptors for any waste or sediment discharge
Ecosystem Services	Fisheries (primary livelihood), water transport, groundwater (water supply), flood attenuation
Safeguards Applied	Riverine/creek buffers, sediment and spill controls, shoreline/bank protection at waterfront or water-locked sites (Agboyi and Gberefu)

ES.4.3 Socio-economic Environment

Aspect	**Findings**
Population	Approximately 42,500–48,000 residents across catchment areas (~14,000–16,000 per facility across Agboyi, Ibereko, and Gberefu)
Livelihoods	Dominated by artisanal fishing and farming, alongside small-scale trade, boat operation, and fish processing

Land Tenure	Government-owned/public parcels (Gberefu); community-interface and customary land dynamics (Agboyi and Ibereko)
Resettlement	Axis RAP: NGN 175,534,518 allocated for compensation at full replacement cost before any works commence
Vulnerable Groups	Fisher households, women-headed households, elderly, persons with disabilities, economically vulnerable residents, and water-dependent transit populations
GBV Risk	Medium–High at Agboyi and Gberefu; Medium at Ibereko (driven by labour influx, poor lighting, lack of confidential reporting mechanisms, economic vulnerability, and riverine isolation)
Cultural Heritage	Gberefu Island holds unique cultural heritage as the site of the historic "Point of No Return". No other heritage sites within 100 m; chance finds possible during excavation; traditional sacred grounds and local heritage markers near Agboyi and Ibereko

ES.4.4 Climate Baseline and Projections (2050, RCP 8.5)

Parameter	High-Risk Exposure	Projected Change
Flooding (pluvial/fluvial)	Agboyi (extreme fluvial flood high-risk site); Ibereko and Gberefu (flood-prone zones)	+30% rainfall intensity; 1:100-year storm becomes ~1:30-year
Coastal erosion / sea-level rise	Gberefu and coastal-adjacent segments	Sea-level rise 0.2-0.5 m; increased storm surge
Heatwaves	All sites (Agboyi, Ibereko, Gberefu)	+2-3^{0}C; days >40^{0}C increase from ~10/year to ~60/year
Extreme rainfall / storms	All sites	+20–30% intensity

ES.4.5 Sensitive Receptors

- **Residential Enclaves:** Densely populated residential communities in Agboyi separated by narrow pathways.
- **Cultural and Community Assets:** The Spirit Attenuation Well located on Gberefu Island.

- **Educational Facilities:** Schools situated in close proximity to the project footprint near Ibereko.

ES.5 Key Environmental and Social Impacts

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ES.5.1 Summary of Unmitigated Impacts

Significance	Impact	Site(s)	Phase
CRITICAL	Asbestos fibre release and exposure during the removal of old roofing sheets	Ibereko and Gberefu	Pre-construction / Construction
CRITICAL	Aquatic pollution via fuel spills and siltation in the Badagry Lagoon and Maidan River from construction barges	Water-linked sites (Agboyi and Gberefu corridors)	Construction
CRITICAL	Economic displacement of one commercial kiosk owner	Agboyi	Pre-construction / Construction
CRITICAL	GBV/SEA/SH risks heightened by labour influx in isolated island communities	All sites (Agboyi, Ibereko, Gberefu)	Construction
CRITICAL	Biohazard risks if infectious medical waste is not transported via a secure "Barge-to-Truck" manifest system	All operational facilities	Operation
CRITICAL	Long-term risk of facility inundation due to a projected 0.5–0.8 m sea-level rise by 2100	Coastal and island facilities (Gberefu, Agboyi)	Operation
CRITICAL	Flooding of construction areas and facilities (including extreme fluvial flooding at Agboyi reaching up to 5 meters)	Ibereko, Gberefu; Agboyi (pre-mitigation)	Construction / Operation
MAJOR	Occupational health and safety risks (including slip/trip/fall hazards, water-transit risks for water-logged sites,	All sites	Construction

	material handling, and potential exposure to legacy waste/asbestos)		
MAJOR	Traffic and access disruption along water pathways and access corridors	Agboyi (water-locked access via canoes)	Construction
MAJOR	Water quality and erosion risks along sensitive riparian zones and mangrove habitats	Creek-adjoining and critical habitat sites (Agboyi, Gberefu)	Construction
MAJOR	Temporary livelihood disruption to fishers and traders	All sites	Construction
MODERATE	Dust, noise, construction waste, general traffic effects	All sites	Construction

ES.5.2 Key Beneficial Impacts

Benefit	**Quantification**
Healthcare access	Approximately 150,000 residents served across the three catchments (~50,000 per facility across Agboyi, Ibereko, and Gberefu)
Maternal mortality reduction	Estimated 20–30% reduction (programme estimate)
Under-five mortality reduction	Estimated 25–35% reduction (programme estimate)
Direct jobs created	85–105 jobs during construction (staggered, prioritizing local hiring ≥ 50%
Indirect jobs	Estimated 5,000–8,000 supply chain jobs
GHG emissions reduction	800–1,500 tCO_2e/year (solar PV transition)
Diesel savings	200,000–400,000 litres/year
Health system resilience	Strengthened pandemic and climate resilience for remote riverine and barrier island communities

ES.6 Analysis of Alternatives

Alternative	Assessment	Conclusion
No-Project Alternative	Continued infrastructure decay, severe flood exposure (such as up to 5-meter floods at Agboyi), and poor access for riverine communities	Rejected – unacceptable
Alternative Sites	Utilizing existing PHC land parcels at Agboyi, Ibereko, and Gberefu avoids additional land acquisition and displacement beyond the addressed RAP scope	Preferred – existing PHC land parcels
Conventional (at-grade) Design	Recurrent seasonal flood damage and service interruption in low-lying hydromorphic and floodplain areas	Rejected
Elevated-Platform / Green Building Design	Designs out extreme flood risks; lower operating costs; climate resilience tailored to water-logged environments	Preferred
Diesel Generators	High operating cost, air pollution, GHG emissions, and logistics challenges for water-locked locations	Rejected
Solar Power + Battery	Low operating cost, reduced emissions, resilient power matching 24–48 hour storage requirements	Preferred
Open Burning of Waste	Air pollution, community health risk, illegal status under environmental laws	Rejected
Non-burn HMWMP (AfDB-compliant)	Colour-coded segregation, non-burn treatment, licensed LAWMA disposal; protects the sensitive red mangrove and creek ecosystems	Preferred

ES.7 Environmental and Social Management Plan (ESMP)

ES.7.1 Key Mitigation Measures

Impact	Mitigation Measure	Responsibility
Asbestos	Licensed survey and abatement, wet removal, air monitoring (≤ 0.1f/ml)	Specialist Contractor
Creek / Water Pollution	Non-burn waste treatment; sediment and spill prevention; barge-to-truck manifest protocols; no	Contractor / Facility Operator

	unauthorized discharge to Badagry Lagoon, Maidan River, or local water corridors	
Flooding	Elevated platform design at Agboyi to manage extreme fluvial floods (up to 5 meters); oversized drainage; elevated electricals	Contractor / PIU
GBV/SEA/SH	Zero-tolerance Code of Conduct, training, confidential survivor-centred reporting, referral pathways tailored for isolated island communities	Contractor / PIU / GBV Specialist
Labour Influx	Labour Influx Plan; ≥50% local hiring; worker conduct rules	Contractor
Traffic and Water Transport Safety	Traffic Management Plan on land and water corridors (including canoe logistics for Agboyi): marshals, speed limits, navigation safety, signage	Contractor
Erosion / Water Quality	Silt fences, sediment traps, bunded fuel storage, spill kits	Contractor
Medical Waste	Colour-coded segregation, non-burn treatment, secure "Barge-to-Truck" transport, LAWMA disposal	Facility Operator
Dust / Noise	Water spraying, covered stockpiles; barriers, restricted hours, scheduling	Contractor

ES.7.2 Monitoring Plan

Parameter	**Indicator**	**Frequency**	**Trigger**
Air Quality	PM10, PM2.5	Daily PM10, Weekly PM2.5	> 50 µg/m³
Asbestos	Airborne fibres	Continuous during abatement	> 0.1 f/ml
Noise	Leq dB(A)	Weekly	> 55dB(A) residential daytime
Water Quality (Creek/Lagoon)	TSS, pH, hydrocarbons	Monthly	TSS > 30 mg/L
Erosion	Silt fence condition	Weekly	Any damage

Waste Segregation	% correct	Daily	< 90%
GBV Training	% workers trained	Monthly	< 100%
GRM	% cases resolved ≤14 days	Monthly	Any unresolved

ES.7.3 Institutional Responsibilities

Entity	Role
PIU (LSMoH)	ESMP oversight, contractor compliance, RAP delivery, GRM, reporting to AfDB
Contractor	CESMP implementation, monitoring, OHS, GBV, community/water-transit liaison; monthly reports to PIU
Facility Operator	Operational ESMP, HMWMP, IPC, wastewater management, barge-to-truck waste logistics
IESM	Independent quarterly audits, compliance verification
FMEnv / LASEPA	Regulatory oversight, permits, inspections
AfDB	Safeguard supervision, compliance enforcement

ES.7.4 ESMP Budget

The ESMP budget covers all environmental, social, monitoring, compliance, climate-resilience, and grievance-redress measures required for the three Group 8. This includes site-specific mitigation actions, environmental monitoring, asbestos management, climate-resilient design features, labour-influx and GBV/SEA/SH controls, stakeholder engagement, and full implementation of the GRM across the axis as shown below:

Site	Construction Phase (₦)	Construction Phase (US$)	Annual Operational (₦)	Annual Operational (US$)
Agboyi PHC	174,570,000	116,380	15,000,000 – 20,000,000	10,000 – 13,333
Ibereko PHC	169,510,000	113,007	12,000,000 – 16,000,000	8,000 – 10,667

Gberefu PHC	161,920,000	107,947	12,000,000 – 16,000,000	–	8,000 – 10,667
TOTAL	**506,000,000**	**337,333**	**39,000,000 – 52,000,000**	**–**	**26,000 – 34,667**

ES.8 Hazardous and Medical Waste Management Plan (HMWMP)

ES.8.1 Waste Categories and Management

Waste Category	Colour Code	Treatment / Disposal
General Waste	Black	LAWMA landfill
Infectious Waste	Yellow	Non-burn treatment (autoclave-type) – LAWMA landfill
Sharps	Red (puncture-proof)	Licensed treatment/disposal
Pharmaceutical Waste	Brown	Return to manufacturer / licensed disposal
Chemical Waste	Blue	Licensed hazardous waste contractor
Asbestos	Special label	Licensed abatement and hazardous waste landfill with manifest

No open burning; no discharge of any waste stream to the Badagry Lagoon, Maidan River, or local water corridors.

ES.8.2 Asbestos Management

- Asbestos-roofing at Ibereko; aged infrastructure likely containing hazardous materials at Gberefu and Agboyi.
- Licensed surveyor to confirm presence/absence and extent.
- Licensed abatement contractor: wet removal, HEPA controls, continuous air monitoring.
- Clearance monitoring: ≤ 0.01f/ml.
- Hazardous waste landfill disposal with manifest.

ES.8.3 Occupational Health and Safety for Waste Handlers

- PPE: gloves, boots, aprons, goggles, masks (P3 respirators for asbestos works).

- Hepatitis B vaccination, tetanus booster.
- Needle-stick protocol (PEP within 72 hours).
- Annual medical surveillance.

ES.9 Gender-Based Violence / SEA / SH Action Plan

ES.9.1 Risk Assessment

Site	Key GBV/SEA/SH Risks	Risk Level
Agboyi	Labour influx (new construction), poor lighting, lack of confidential reporting, economic vulnerability, extreme fluvial flood pressures, limited police response, restrictive cultural norms, and riverine isolation	Medium–High
Gberefu	Waterfront and barrier-island vulnerability, tourist/visitor dynamics, poor lighting, limited reporting channels	Medium–High
Ibereko	Flood-prone isolation, poor lighting, limited confidential reporting	Medium

ES.9.2 Prevention Measures

Measure	Description
Code of Conduct	Zero tolerance for GBV/SEA/SH; signed by all workers, subcontractors, security
Worker Training	Induction + monthly toolbox talks
Community Awareness	Regular sessions; women's groups; fisher and trader associations; youth engagement
Safe Recruitment	No minors; background checks; gender-balanced hiring
Improved Lighting	Solar lighting around PHCs, paths, and landing/docking areas
Safe Spaces	Confidential consultation rooms within the PHCs

ES.9.3 Response Measures

Measure	Description
Survivor-Centred Protocol	Confidentiality, safety, respect, no retaliation
Reporting Channels	Hotline, suggestion boxes, female GRM focal points, anonymous reporting options
Referral Pathways	Medical (PEP within 72 hours), psychosocial, legal, shelter – established before construction
Sanctions	Warning – suspension – termination – prosecution

GRM	48-hour acknowledgement; 14-day resolution

ES.9.4 Monitoring Indicators

Indicator	Target	Frequency
Workers trained	100%	Monthly
Community members reached	≥ 60%	Quarterly
GBV cases resolved ≤14 days	≥90%	Monthly
CoC compliance	100%	Monthly
Survivor satisfaction	≥80%	Quarterly

ES.10 Stakeholder Engagement and Grievance Redress Mechanism

ES.10.1 Stakeholder Consultation Activities

Activity	Number	Participants
Community meetings	6	342 total (48% women)
Focus Group Discussions	3	Women, youth, elderly
LGA health authority meetings	2	Health officials
LASEPA meeting	1	Regulatory officials

Concern	Response
Disruption of access during construction	Traffic Management Plan; maintain access
Waste management	HMWMP; LAWMA disposal contracts

Employment for locals	≥mpl local hiring target
Safety of children near construction sites	Fencing, signage, community liaison
Wetland/lagoon protection	50 m buffers; sediment controls
Asbestos risks	Licensed abatement; air monitoring
GBV/SEA/SH	Code of Conduct; confidential reporting; referral pathways

ES.10.2 Key Concerns Raised by Stakeholders

ES.10.3 Grievance Redress Mechanism (GRM)

The GRM provides accessible, confidential, and timely resolution of grievances:

Feature	Description
Entry Points	Toll free hotline, suggestion boxes, CLOs, female GRM focal points
Acknowledgement	Within 48 hours
Resolution	Within 14 days (Level 1); 21 days (final appeal)
Tiered System	PHC level → LGA liaison → PIU → FMEnv/AfDB
GBV Cases	Confidential handling; survivor-centred approach
Reporting	Monthly to AfDB

ES.11 Disclosure and Reporting

ES.11.1 Disclosure Requirements

This ESIA will be disclosed in accordance with AfDB and FMEnv requirements for Category 1 projects:

Requirement	Detail
Disclosure Period	120 days (AfDB requirement for Category 1 projects)
Disclosure Locations	LSMoH headquarters, Badagry LGA secretariat, project website, hard copies in PHC waiting areas
Public Hearing	Within 30 days after disclosure
Non-Technical Summary	In English and Yoruba

ES.11.2 Reporting Framework

Report	Frequency	From → To
E&S Monitoring Report	Weekly	Contractor → PIU
E&S Performance Report	Monthly	PIU → AfDB
ESMP Compliance Report	Quarterly	Facility Operator → PIU
Independent Audit Report	Quarterly	IESM → AfDB
Incident Report	Within 24 hours	Contractor → PIU

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ES.12 Conclusion and Recommendations

ES.12.1 Overall Conclusion

The ESIA concludes that the three PHC facilities in the Badagry Axis; Ibereko, Gberefu, and Agboyi are environmentally and socially viable. All adverse impacts; environmental, social, health, safety, and GBV-related can be effectively mitigated through the ESMP, HMWMP, GBV Action Plan, and other safeguard instruments.

The project will deliver substantial positive impacts, including:

- Expanded access to quality healthcare for residents of the Badagry Axis
- Reduced maternal and child mortality
- Strengthened climate resilience through green building design
- Local employment and economic growth
- Reduced GHG emissions through solar PV and energy-efficient infrastructure
- Improved gender safety and GBV prevention systems

The project aligns with the AfDB ISS (2024), the FMEnv EIA Act, the IFC Performance Standards, the WHO standards, the ILO conventions, and the Equator Principles IV.

ES.12.2 Recommendations

Pre-Construction Recommendations

1. Conduct asbestos surveys at Ibereko and Agboyi; implement abatement if confirmed
2. Establish GBV referral pathways (medical, psychosocial, legal, shelter)
3. Recruit GBV Specialist and activate confidential reporting channels
4. Implement climate-resilient design (oversized drainage, elevated electricals, solar PV)
5. Obtain all regulatory permits (LASEPA, LAWMA, building approvals)
6. Conduct wetland and lagoon Critical Habitat screening for Gberefu and Ibereko
7. Train contractors and PIU staff on AfDB ISS and ESMP implementation

Construction Phase Recommendations

1. Enforce CESMP: dust control, noise limits, erosion control, spill prevention
2. Implement GBV Action Plan: CoC, training, reporting, sanctions
3. Ensure ⩾50% local hiring to reduce labour influx
4. Conduct environmental monitoring (air, noise, water, waste)
5. Maintain GRM: 48-hour acknowledgement, 14-day resolution
6. Implement Traffic Management Plan where access routes are affected
7. Conduct quarterly IESM audits and implement corrective actions

Operational Phase Recommendations

1. Implement HMWMP: segregation, autoclaving, LAWMA disposal
2. Apply WHO IPC standards: hand hygiene, sterilisation, PPE, cleaning
3. Maintain climate-resilient features: solar PV, drainage, heat management
4. Continue GBV prevention and response: staff training, confidential reporting
5. Maintain GRM for patients and community members
6. Desludge septic tanks every 2–3 years
7. Prioritise solar power to reduce GHG emissions

ES.12.3 Final Statement

The Lagos State Health Infrastructure Project (LSHIP) for Badagry Axis Group 8 will significantly improve public health outcomes, strengthen health system resilience, and enhance environmental sustainability. With robust mitigation measures, strong institutional oversight, and continuous

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community engagement, the project will deliver long-term benefits while maintaining full compliance with national and international safeguards.

The project is recommended for approval by the Federal Ministry of Environment (FMEnv) and the African Development Bank (AfDB), subject to:

1. Full implementation of the ESMP before commissioning of each PHC
2. Availability of a third-party external monitoring report every 6 months
3. Evidence of functioning GRM and GBV referral pathway prior to construction start

CHAPTER 1 – INTRODUCTION AND PROJECT BACKGROUND

1.0 Introduction

The Lagos State Health Infrastructure Project (LSHIP) is a US$200 million health system strengthening programme implemented by the Lagos State Ministry of Health (LSMoH) with financing from the African Development Bank (AfDB) (African Development Bank, 2025). The initiative aims to modernize, expand, and climate-proof healthcare infrastructure across Lagos State through the construction of 11 new Primary Healthcare Centres (PHCs), refurbishment of 19 existing PHCs, and the development of secondary and tertiary healthcare facilities including a 140-bed General Hospital in Ibeju-Lekki and the Infectious Diseases Research Institute (IDRI) in Yaba (Lagos State Ministry of Health, 2025).

The AfDB has classified the LSHIP as Category 1 (High Risk) under its Integrated Safeguards System (ISS), requiring full Environmental and Social Impact Assessments (ESIAs) for all 30 PHC sites (African Development Bank, 2025). This classification reflects the project's multi-site footprint, potential involuntary resettlement at six locations, presence of asbestos in older facilities, proximity to wetlands and mangrove ecosystems, and the scale of construction activities in densely populated urban and peri-urban communities (African Development Bank, 2025).

This ESIA has been prepared in accordance with the FMEnv EIA Act CAP E12 LFN 2004 (Federal Ministry of Environment, 2004), the AfDB ISS (OS1–OS5) (African Development Bank, 2013), IFC Performance Standards (International Finance Corporation, 2012), WHO healthcare waste guidelines (World Health Organization, 2014), and relevant Lagos State environmental regulations (Lagos State Environmental Protection Agency, 2017). It provides a comprehensive assessment of the potential environmental and social impacts associated with the LSHIP and proposes mitigation, management, and monitoring measures to ensure that the project is implemented sustainably and in compliance with national and international standards.

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1.1 National and State Context

Nigeria's healthcare system faces significant challenges, including inadequate financing, high out-of-pocket expenditure, weak primary healthcare systems, and limited diagnostic capacity (Federal Ministry of Health, 2018). With a population exceeding 200 million (World Bank, 2024), the country allocates only 4-5% of its annual budget to health, far below the 15% Abuja Declaration target (African Union, 2001; World Health Organization, 2023). Out-of-pocket expenditure accounts for over 75% of health financing (National Bureau of Statistics, 2022).

The National Primary Health Care Development Agency (NPHCDA) has driven reforms through the Basic Health Care Provision Fund (BHCPF). Nigeria allocates 1% of its Consolidated Revenue Fund to healthcare through the BHCPF. In 2024, the Federal Government disbursed N45.43 billion under the BHCPF to states across the federation. Lagos State received only N995 million – approximately 2% of the total disbursement – despite housing over 30 million people and contributing more than 30% of Nigeria's GDP (National Primary Health Care Development Agency, 2024; National Bureau of Statistics, 2023). This funding inadequacy underscores the critical need for the LSHIP intervention.

Lagos State, with an estimated population exceeding 30 million (Lagos State Bureau of Statistics, 2024), experiences health challenges typical of a rapidly growing megacity: high maternal and child mortality, a rising burden of non-communicable diseases, and weak pandemic preparedness (Lagos State Ministry of Health, 2023). Only 220 of 339 public PHCs are functional (Lagos State Primary Healthcare Board, 2024). Most secondary hospitals operate at well above designed capacity, and the state has no BSL-3 or BSL-4 laboratory for emerging infectious diseases (Nigeria Centre for Disease Control, 2024).

Table 1.1: Lagos State Health System Overview

Indicator	Value
Lagos State GDP (nominal)	US$102 billion
Estimated Population (2022)	30 million
Total Healthcare Budget (2024)	N151 billion (6% of state budget)
Primary Health Centres (Public)	339
Functional PHCs	~220
Secondary/Tertiary Public Facilities	30
Private Hospitals	2,333
Health Insurance Coverage	1,300,000+ residents

1.2 Geographic & Strategic Context

1.2.1 Project Corridor & Lagos State Coverage

The 29 project sites are distributed across 20 Local Government Areas (LGAs) and 37 Local Council Development Areas (LCDAs) in Lagos State (Lagos State Ministry of Local Government and Community Affairs, 2024). Unlike a linear infrastructure project, the LSHIP footprint comprises 29 discrete nodes, which have been systematically organised into five geographical

clusters to enhance the efficiency of fieldwork, logistics, and environmental and social assessments (Multiple Development Services, 2026). These clusters are delineated based on geographic proximity, access routes, and ecological characteristics, ensuring that project sites with similar environmental conditions, settlement patterns, and administrative contexts are assessed cohesively and consistently (Lagos State Ministry of Environment, 2023).

The distribution of project sites across the eight clusters as presented below:

Table 1.2: Distribution of Project Sites across the Eight Clusters

S/N	PHC Facilities	LGA	LCDA	Status	Coordinates	
Group 1						
1	Agboju PHC	Amuwo Odofin	Oriade LCDA	Construction	6.458077	3.283238
2	Oridilu PHC	Ajeromi Ifelodun	Ifelodun LCDA	Refurbishment	6.464410	3.351390
3	Bada PHC	Alimosho	Ayobo Ipaja LCDA	Refurbishment	6.590535	3.228266
4	Ogbomosotedo PHC	Alimosho	Egbe Idimu LCDA	Refurbishment	6.575358	3.258728
Group 2						
1	Isolo PHC	Oshodi-Isolo	Isolo LCDA	Refurbishment	6.528600	3.320807
2	Oba Salami PHC	Lagos Mainland	Yaba LCDA	Refurbishment	6.522283	3.368430
3	Ojodu PHC	Ikeja	Ojodu LCDA	Construction	6.631394	3.342287
4	Otumara PHC	Lagos Mainland	Yaba LCDA	Construction	6.477588	3.374566

Group 3						
1	Omolaiye PHC	Ikorodu	Ikorodu North LCDA	Refurbishment	6.66839365	3.47307938
2	Eruwen PHC	Ikorodu	Ikorodu North LCDA	Construction	6.60440414	3.54358095
3	Olorunda PHC	Ikorodu	Ikorodu North LCDA	Construction	6.66833451	3.58520869
4	Agura PHC	Ikorodu	Ikorodu LGA	Construction	6.57996161	3.62752998
Group 4						
1	Imota PHC	Ikorodu	Imota LCDA	Refurbishment	6.66005734	3.66968297
2	Bayeiku PHC	Ikorodu	Igbogbo Bayeiku LCDA	Refurbishment	6.546943	3.543106
3	Abule Eko PHC	Ikorodu	Ijede LCDA	Refurbishment	6.58331880	3.59483036
4	Owutu PHC	Ikorodu	Ikorodu West LCDA	Construction	6.63301273	3.48131561
Cluster 5						
1	Agbowa PHC	Epe	Ikosi Ejirin LCDA	Construction	6.639779	3.712229

2	Ejirin PHC	Epe,	Ikosi Ejirin LCDA	Refurbishment	6.612939	3.897653
3	Solu Alade PHC	Ibeju Lekki	Ibeju Lekki LCDA	Refurbishment	6.43917	3.78986
4	Orimedu PHC	Ibeju Lekki	Ibeju Lekki LCDA	Construction	6.44066	3.90141
Group 6						
1	Magbon PHC	Ibeju Lekki	Lekki LCDA	Refurbishment	6.42880	3.99687
2	Idasho PHC	Ibeju Lekki	Lekki LCDA	Refurbishment	6.42940	3.98636
3	Idotun PHC	Ibeju Lekki	Lekki LCDA	Refurbishment	6.42451	4.2303
Group 7						
1	APA PHC	Badagry	Badagry West LCDA	Construction	6.430864	2.823958
2	Igbogbele PHC	Badagry	Badagry West LCDA	Refurbishment	6.423141	2.779165
3	Farasime PHC	Badagry	Badagry West LCDA	Refurbishment	6.425841	2.714320
Group 8						

1	Ibereko PHC	Badagry	Olorunda LCDA	Refurbishment	6.441703	2.919342
2	Gberefu PHC	Badagry	Badagry LGA	Refurbishment	6.397317	2.873419
3	Agboyi PHC	Kosofe	Agboyi Ketu LCDA	Refurbishment	6.578345	3.409531

Total = 29 PHCs

To support spatial understanding and ESIA planning, the clusters are presented in Table 1.3.

Table 1.3: Geographical Clusters for the 29 LSHIP Project Sites

Cluster	Description	LGAs / LCDAs Covered	General Characteristics
Cluster 1: Ikorodu Axis	Northern inland corridor	Ikorodu LGA, Ikorodu North LCDA, Ikorodu West LCDA, Igbogbo-Baiyeku LCDA, Imota LCDA, Ijede LCDA	Freshwater swamp forest zone; peri-urban expansion; erosion-prone and waterlogged pockets
Cluster 2: Badagry Axis	Western coastal corridor	Badagry LGA, Badagry West LCDA, Olorunda LCDA	Coastal/mangrove ecosystems; riverine communities; limited access routes; high climate vulnerability
Cluster 3: Eti-Osa / Ibeju-Lekki Axis	Eastern coastal and industrial corridor	Ibeju-Lekki LGA, Lekki LCDA, Ikosi-Ejirin LCDA	Rapid urbanisation; proximity to Lekki Free Zone; mangrove and wetland systems
Cluster 4: Mainland / Yaba Axis	Central metropolitan corridor	Lagos Mainland LGA, Yaba LCDA, Isolo LCDA, Ifelodun LCDA	High-density urban environment; mixed residential-commercial land use; ageing infrastructure

Cluster 5: Alimosho / Agege / Ikeja Axis	North-central metropolitan corridor	Alimosho LGA, Ayobo-Ipaja LCDA, Egbe-Idimu LCDA, Kosofe LGA, Agboyi-Ketu LCDA, Ikeja LGA	Densely populated; mixed urban/peri-urban; drainage and flooding challenges



Figure 1.1 – Map of Nigeria Showing Lagos State presents a map of Nigeria highlighting Lagos State, illustrating its strategic location in the southwestern region of the country and its coastal boundary along the Atlantic Ocean.



Figure 1.2 – Map of Lagos State Showing the 20 LGAs and 29 Project Sites

The map above provides a detailed administrative map of Lagos State, showing all 20 LGAs and the 29 LSHIP project sites, each represented by colour-coded markers corresponding to their assigned geographical clusters.

Figure 1.3 displays five cluster-specific maps, each depicting the project sites along a particular axis, including major access roads, surrounding water bodies, ecological features, and sensitive receptors relevant to the ESIA.

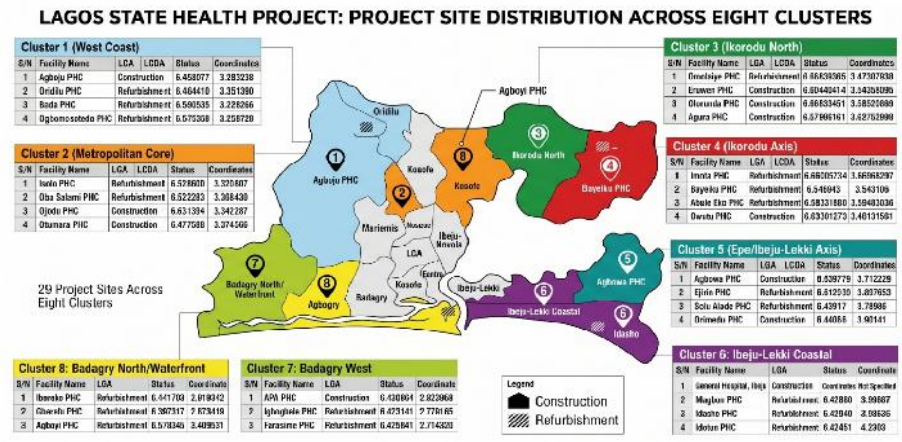


Figure 1.3: Spatial Overview of Project Sites Locations with Coordinates

1.2.2 Project Typology Overview

Lagos State sits at the transition between two major ecological zones (Lagos State Ministry of Environment, 2023; Nigerian Conservation Foundation, 2021):

- Freshwater Swamp Forest – Dominant in Ikorodu, Epe, and parts of the Ibeju-Lekki Axis. Characterised by seasonal flooding, clay soils, and high-water tables.
- Coastal Mangrove Wetlands – Dominant in Eti-Osa, Ibeju-Lekki, and the Badagry corridor. Tidal influence, saline conditions, and sensitive mangrove ecosystems (United Nations Environment Programme, 2020).

The following programme-wide ecological sensitivities are directly relevant to this project, with the Group 8 facilities specifically implicated as noted:

- Wetland areas: Agbowa, Oke Ogbe, Eruwen, Omolaiye (waterlogged/sensitive ecosystem)
- Mangrove proximity: Orimedu, Idotun, Gberefu, APA (Ibeju-Lekki Axis West) – Gberefu PHC (Group 8) is confirmed among the programme's mangrove-proximate sites,

consistent with its own axis baseline classifying it as Likely Critical Habitat (red mangrove, *Rhizophora racemosa*)

- Riparian corridors: Oridilu (Amukoko), Baiyeku (waterfront), Abule Eko (lakeside), Ejirin (riverside) – Agboyi PHC (Group 8), situated on the Maidan/Majidun River system in Kosofe LGA, shares this riparian/floodplain character, though it is administratively distinct from the Badagry LGA riparian sites listed here

In addition to the statewide cluster distribution, the 29 PHC facilities under the Lagos State Health Project comprise 10 new-construction sites and 19 refurbishment sites (Figure 1.4). All three Group 8 facilities Ibereko, Gberefu, and Agboyi are refurbishment sites ("Total Revitalization" of existing structures), reflecting the varying levels of structural intervention required across the project footprint.

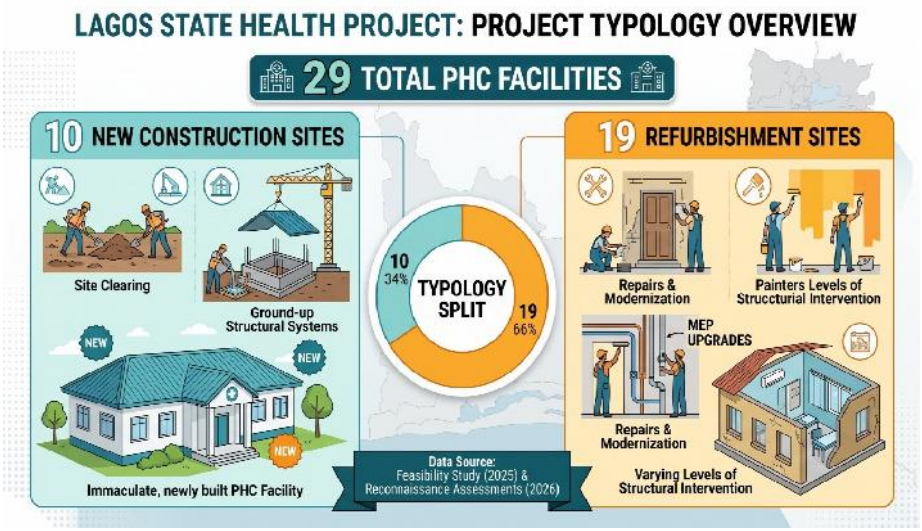


Figure 1.4: Project Typology Overview

1.2.3 Need for ESIA across All 29 PHC Facilities

Although the PHC sites differ in size, location, and intervention type, the entire programme requires full ESIA coverage due to the combined environmental and social risks identified during screening. The need for ESIA across all facilities, including the three Group 8 facilities, is driven by the following factors:

a) Multi-site, statewide footprint. The project spans 20 LGAs and 37 LCDAs. Group 8 itself illustrates this multi-jurisdictional complexity: Ibereko and Gberefu fall within Badagry LGA, while Agboyi falls within Kosofe LGA the three facilities span two separate local government areas despite being assessed within a single axis volume.

b) High-risk construction activities at multiple sites. Not applicable to Group 8 directly (all three facilities are refurbishment, not new construction), though refurbishment at this axis carries its own elevated risk profile (see (c) below).

c) Refurbishment sites still carry significant E&S risks. Nineteen PHCs programme-wide require refurbishment, including asbestos removal (confirmed or suspected), structural repairs, and construction waste management. Ibereko and Gberefu are among the sites with suspected asbestos in old roofing sheets, and all three Group 8 sites require structural repairs – notably remediation of "rising damp" at Ibereko and Gberefu.

d) Land acquisition and economic displacement at several sites. Once AfDB OS5 (Involuntary Resettlement) is triggered at any site, AfDB requires full ESIA coverage for the entire programme. Agboyi (kiosk operator) is one of the five programme-wide sites triggering a RAP requirement (Table 1.10), alongside Agboju, Ogba, Olorunda, and Agura.

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e) Sensitive environmental settings. Several PHCs are located in wetlands, coastal zones, or flood-prone areas requiring site-specific impact assessment and biodiversity screening under AfDB OS3/OS6. Gberefu (Barrier Island, storm-surge exposure, mangrove Critical Habitat) and Agboyi (natural floodplain, water levels to 5 m during peak fluvial flooding) both meet this criterion.

f) Public health infrastructure is inherently high-sensitivity, applying equally to Ibereko, Gberefu, and Agboyi as operational healthcare facilities generating medical waste and wastewater.

g) Need for a unified ESMP across all sites, ensuring the Group 8 axis-specific ESMP (costed at approximately USD 315,000 excluding the standalone Agboyi RAP) is harmonised with the consolidated, programme-wide management framework.

1.3 Project Delivery & Key Entities

1.3.1 Lagos State Health Project (LSHP) – Project Owner

The Lagos State Health Project (LSHP) is a flagship statewide health infrastructure upgrade programme covering 29 PHCs across 20 LGAs and 37 LCDAs. For Group 8, the LSHIP is responsible for coordination across both Badagry LGA (Ibereko, Gberefu) and Kosofe LGA

(Agboyi), a cross-jurisdictional coordination requirement not present in single-LGA axes such as Groups 6 and 7.

1.3.2 African Development Bank (AfDB) – Financier & Safeguard Authority

The African Development Bank (AfDB) is the primary financier of the Badagry Axis Group 8 Primary Health Centre (PHC) interventions (covering Agboyi, Gberefu, and Ibereko) and the lead institution responsible for enforcing environmental and social safeguards. Under the updated AfDB Integrated Safeguards System (ISS, 2023), the project requires comprehensive safeguard oversight due to its multi-site nature, construction activities, potential land-related impacts, and the sensitivity of healthcare infrastructure.

AfDB's Responsibilities Include:

- Reviewing and clearing the Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) documents.
- Ensuring compliance with the triggered Operational Safeguards under the 2023 ISS, specifically:
    - **OS1:** Environmental and Social Assessment
    - **OS3:** Resource Efficiency and Pollution Prevention and Management
    - **OS5:** Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
    - **OS6:** Biodiversity Conservation and Sustainable Management of Living Natural Resources
    - **OS10:** Stakeholder Engagement and Information Disclosure
- Conducting supervision missions and reviewing Back-to-Office Reports (BTORs).
- Monitoring the implementation of ESMP and RAP actions.
- Ensuring that mitigation measures are adequately funded and executed.

AfDB's involvement ensures that the project meets international best practices for environmental and social sustainability across the Agboyi, Gberefu, and Ibereko axis.

1.3.3 Environmental & Social Consultant – Multiple Development Services (MDS)

Multiple Development Services (MDS) is the environmental and social consultant appointed to prepare the ESIA, RAP, ESMP, and associated safeguard instruments for the Badagry Axis Group 8 PHC facilities. MDS conducted the feasibility-level screening and reconnaissance assessments that informed the project typology and safeguard categorisation.

MDS is responsible for:

- preparing the ESIA for APA, Igbogbele, and Farasime,
- conducting baseline studies, stakeholder engagement, and impact assessment,
- preparing RAPs for sites triggering AfDB OS5,
- developing the consolidated ESMP and monitoring framework,
- supporting regulatory submissions to FMEnv and LASEPA,
- Advising the project owner on safeguard compliance during implementation.

MDS also provides technical guidance to contractors and supervising engineers to ensure that mitigation measures are integrated into construction and operational activities.

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1.3.4 Other Supporting Entities

- **Federal Ministry of Environment (FMEnv):** The statutory regulator responsible for ESIA approval under the EIA Act CAP E12 LFN 2004. It issues the ESIA certification and monitors overarching project compliance.
- **National Environmental Standards and Regulations Enforcement Agency (NESREA):** The federal agency responsible for enforcing all national environmental standards, regulations, policies, and guidelines throughout the project lifecycle.
- **Lagos State Environmental Protection Agency (LASEPA):** The state-level regulator tasked with environmental compliance, pollution control, and continuous monitoring. LASEPA directly oversees noise, air quality, waste management, and water quality compliance within the state.
- **LGAs/LCDAs:** Provide essential local oversight, community liaison, and support for the implementation of the Resettlement Action Plan (RAP) or Livelihood Restoration Plan (LRP). They facilitate site access, coordinate local security, and drive grassroots stakeholder engagement.
- **Contractors & Supervising Engineers:** Responsible for the day-to-day implementation of construction-phase mitigation measures. They are strictly required to comply with the Environmental and Social Management Plan (ESMP), national Occupational Health and Safety (OHS) standards, the updated AfDB ISS (2023), World Bank Group Environmental, Health, and Safety (WB EHS) Guidelines, and core International Labour Organization (ILO) standards.

Figure 1.4 presents the institutional framework for the LSHIP, illustrating the relationships among the key entities responsible for financing, regulation, implementation, monitoring, and community engagement.

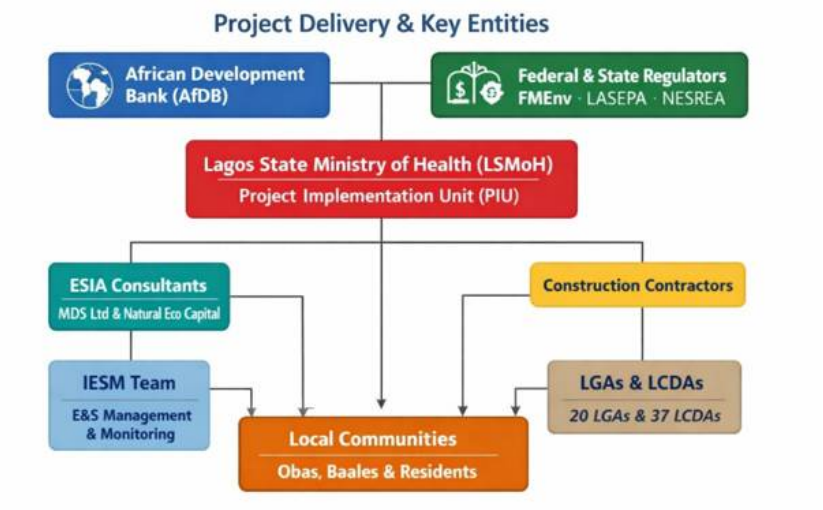


Figure 1.5: Institutional Framework Organogram

The framework positions the African Development Bank (AfDB) as the financing institution; the Federal Ministry of Environment (FMEnv), NESREA and LASEPA as regulatory authorities; and the Lagos State Ministry of Health (LSMoH) through its Project Implementation Unit (PIU) as the implementing agency. It further highlights operational linkages to the ESIA Consultants, Construction Contractors, the Independent Environmental and Social Monitor (IESM), and local communities, including traditional institutions such as Obas and Baales.

This institutional arrangement ensures coordinated oversight across federal, state, local, and community levels. Crucially, it guarantees that project governance aligns comprehensively with both national environmental legal frameworks and best international practices, ensuring strict adherence to WB EHS requirements and ILO labour standards throughout the project footprint.

1.4 ESIA Rationale, Objectives, and Scope

1.4.1 ESIA Rationale

The LSHIP requires a full ESIA for three reasons, each with direct Group 8 relevance:

- Regulatory Mandate (Federal): The EIA Act CAP E12 LFN 2004 (Section 2) and the Mandatory Study List include healthcare facilities of this scale (Federal Ministry of Environment, 2004). FMEnv has confirmed Category I status (Federal Ministry of Environment, 2025).
- Lender Requirement (AfDB): The December 2025 Identification Mission confirmed Category 1 (High Risk) under the AfDB ISS 2023, driven programme-wide by: involuntary resettlement at six sites (including Agboyi); environmentally sensitive locations including wetlands and coastal zones (Gberefu's barrier-island/storm-surge setting; Agboyi's floodplain); hazardous materials suspected at 9 sites (including Ibereko and Gberefu); labour influx risks (500-1,000 workers programme-wide); and GBV/SEA/SH risks – the programme's own gender and vulnerability screening identifies Agboyi and Gberefu specifically among the sites with High GBV/SEA/SH risk.
- International Good Practice: AfDB ISS 2023 (OS1-OS10) as the primary framework, complemented by IFC Performance Standards, Equator Principles IV, WHO healthcare waste guidelines, and ILO labour standards.

1.4.2 ESIA Objectives

The overarching objective of this Environmental and Social Impact Assessment (ESIA) is to serve as the principal due diligence instrument for the LSHIP within this axis. It will systematically evaluate all potential environmental and social consequences, design robust measures to avoid, minimize, and mitigate adverse impacts, and establish a clear management framework to ensure the project is implemented responsibly, sustainably, and in full compliance with safeguard standards.

Specific Objectives for this ESIA Report

1. Establish Environmental and Social Baselines: Document current conditions across two local government areas Badagry LGA (Ibereko, Gberefu) and Kosofe LGA (Agboyi) reflecting the axis's distinctive cross-jurisdictional composition.
2. Assess Mangrove and Riverine Ecosystem Impacts: Evaluate potential impacts on the Likely Critical Habitat mangrove systems at Gberefu and Agboyi, and the Badagry Lagoon and Maidan/Majidun River systems that the axis's works interface with.
3. Address Waterborne Logistics Constraints: Analyse the environmental and social implications of transporting materials and personnel by motorized barge and canoe to the

island/riverine sites of Gberefu and Agboyi – a defining logistical characteristic unique to this axis.

4. Address Cultural Heritage Sensitivities: Evaluate and safeguard the unique cultural heritage of Gberefu Island as the historic "Point of No Return," and the Spirit Attenuation Well as a sensitive receptor.
5. Address Social Safeguards: Establish measures to mitigate risks associated with labor influx, specifically focusing on the prevention of Gender-Based Violence (GBV) and Sexual Exploitation, Abuse, and Harassment (SEA/SH).
6. Evaluate Resettlement Requirements: Prepare and coordinate the Resettlement Action Plan (RAP) for the two Agboyi PAPs (commercial kiosks operator), the only resettlement trigger within this axis.
7. Identify Site-Specific Mitigation Measures: Develop a tailored ESMP addressing rising-damp structural remediation (Ibereko, Gberefu), asbestos abatement (Ibereko, Gberefu), and aquatic/waterfront safety (all sites).
8. Enhance Community Engagement: Facilitate consultation with the Obas and Baales of Agboyi, Gberefu, and Ibereko, recognising traditional institutions as the first point of contact for community-level disputes.
9. Ensure Regulatory Compliance: Demonstrate full compliance with the updated AfDB Integrated Safeguards System (ISS, 2023), specifically Operational Safeguards OS1–OS10, as well as the FMEnv EIA Act CAP E12 LFN 2004, NESREA regulations, LASEPA requirements, and international good practice (IFC, WHO, ILO). Verify that all proposed activities at the three facilities comply with Lagos State environmental standards and LSHIP safeguards.
10. Prepare Safeguard Instruments: Develop the site-specific ESMP, HMWMP (including the Barge-to-Truck waste-transfer protocol), RAP (Agboyi), and GBV Action Plan for the Group 8 facilities.
11. Support Informed Decision-Making: Provide regulators (FMEnv, LASEPA), the financier (AfDB), and stakeholders with comprehensive information to support project approval and implementation.

1.4.3 Scope of this ESIA Report

The scope of the Environmental and Social Impact Assessment (ESIA) for the Lagos State Health Infrastructure Project (LSHIP) encompasses the comprehensive evaluation of 29 Primary Health Centres (PHCs) distributed across eight geographical clusters in Lagos State. It covers the entire project lifecycle, from pre-construction activities to the long-term operational phase, ensuring alignment with both Nigerian regulatory standards and international safeguard frameworks.

Geographical and Physical Scope

- Project Footprint (Core Area): The immediate land area within the existing boundaries of the Ibereko, Gberefu, and Agboyi Primary Health Centre (PHC) facilities.
- Zone of Influence (Primary Area): Surrounding riverine and island communities within Olorunda LCDA, Badagry Central (Badagry LGA), and Agboyi-Ketu LCDA (Kosofe LGA) that may experience localised noise, dust, or waterway-traffic disruptions.
- Regional Context (Secondary Area): The broader Badagry corridor and the Kosofe riverine system, ensuring alignment with Lagos State's regional environmental safeguards and climate-resilience strategies across both jurisdictions.
- Cumulative Influence Zone (CIZ): Evaluation of the spatial and temporal reach of combined stressors, specifically where LSHIP activities overlap with other regional infrastructure projects along the Badagry Creek and Kosofe waterways.
- Infrastructure Types: The scope includes facility-specific actions involving the refurbishment of existing structures at Ibereko, Gberefu, and Agboyi PHCs (including rising-damp remediation and MCH-wing expansion) alongside flood-resilient, elevated clinical blocks tailored to low-lying coastal and hydromorphic environments.

Environmental and Technical Scope

- Baseline Data Collection: Establishment of site-specific air quality, noise, groundwater, soil, and socio-economic baseline data for all three sites, including the nine geo-referenced sampling points established across the axis.
- Ecosystem Assessment: Detailed evaluation of the footprint within mangrove and riparian ecosystems at Gberefu and Agboyi, both classified as "Likely Critical Habitat" due to the presence of red mangroves ($Rhizophora\ racemosa$) and sensitive riparian corridors.
- Climate Risk Integration: Assessment of long-term sea-level rise 0.5- 0.8m by 2100 affecting Gberefu and Agboyi, acute fluvial flood risk at Agboyi (with water levels

reaching up to 5 meters during peak flooding), storm surge susceptibility at the Gberefu barrier island, and the transition to renewable energy through solar-hybrid installations.

- Hazardous Material Management: Specific focus on the identification, safe handling, and licensed abatement of asbestos, particularly in older structures across the axis.
- Waste Management: Protocols for construction debris and medical waste, featuring the secure "Barge-to-Truck" manifest system required for waterborne collection from Gberefu and Agboyi to protect sensitive mangrove habitats and creek waters from unauthorized discharge.

Social and Stakeholder Scope

- Social Safeguards: Identifying risks related to labour influx in isolated island and riverine communities, with a specialized focus on preventing Gender-Based Violence (GBV) and Sexual Exploitation, Abuse, and Harassment (SEA/SH).
- Community Health and Safety: Assessment of impacts on riverine and island communities during waterborne mobilisation of equipment and labour.
- Access and Logistics: Analysis of transport-related impacts specific to motorized barge and canoe use for Gberefu and Agboyi.
- Livelihood Assessment: Evaluation of temporary impacts on artisanal fishing and farming livelihoods, alongside the permanent economic displacement of the Agboyi kiosk operator managed via the Resettlement Action Plan (RAP).
- Cultural Heritage: Assessment and protection of unique cultural assets, including the historic "Point of No Return" heritage site and the Spirit Attenuation Well at Gberefu Island, alongside local sacred grounds near Agboyi and Ibereko.
- Stakeholder Engagement: Mapping and consulting with diverse local communities, traditional leaders, fishers, traders, and health workers across all sites to ensure local ownership.
- Grievance Redress: Establishing a formal Mechanism (GRM) to handle project-related complaints across all project locations.

Regulatory Framework Scope

- National Compliance: Adherence to the Nigeria Climate Change Act 2021, Federal Ministry of Environment (FMEnv) guidelines, and Lagos State environmental laws.

- International Standards: The assessment triggers and follows the updated AfDB Integrated Safeguards System (ISS, 2023) Operational Safeguards (OS1, OS3, OS5, OS6, and OS10) and the IFC Performance Standards (PS1–PS8).

Table 1.4 provides a structured overview of the facilities by LGA/LCDA, distinguishing between new construction and refurbishment sites for ease of reference and management is given belo:

Table 1.4: Group 8 Facility Overview Matrix

Facility Name	Scope Type	Location & Coordinates	Environmental & Social Context
PHC, Agboyi	Construction / Elevated Platform	Agboyi Community, Kosofe LGA	Natural floodplain with water levels reaching up to 5 meters during peak fluvial flooding; low-lying coastal plain sands and hydromorphic clay soils; likely critical habitat with red mangroves; residential enclaves separated by narrow paths; water-locked access via canoes.
PHC, Ibereko	Refurbishment	Ibereko Community, Badagry Axis	Semi-rural community characterized by expanding residential clusters, schools near the footprint, structural distress (rising damp and wall cracks), aged structures requiring asbestos inspection/abatement, and growing demand for primary healthcare.
PHC, Gberefu	Refurbishment / Upgrade	Gberefu Island, Badagry Axis	Narrow barrier island susceptible to storm surges; unique cultural heritage as the site of the historic "Point of No Return" and the Spirit Attenuation Well; classified as likely critical habitat with red mangroves; severe historical dilapidation requiring remediation of structural decay.

Temporal Scope

The temporal scope ensures that impacts are managed across every stage of the project's evolution:

- Pre-Construction Phase: Site reconnaissance, environmental baseline data gathering, asbestos surveys and licensed abatement, implementation of the RAP (including full compensation prior to works), and institutional training.
- Construction Phase: Active physical works, including structural retrofitting, rising-damp remediation, MCH-wing expansions, water-transit and barge/canoe logistics, and the installation of solar-hybrid and digital infrastructure.
- Operational Phase: Long-term management of the facilities, focusing on secure "Barge-to-Truck" medical waste logistics, maintenance of solar-hybrid power systems, ongoing community health outreach, and adherence to the operational ESMP and WHO Infection Prevention and Control (IPC) standards.

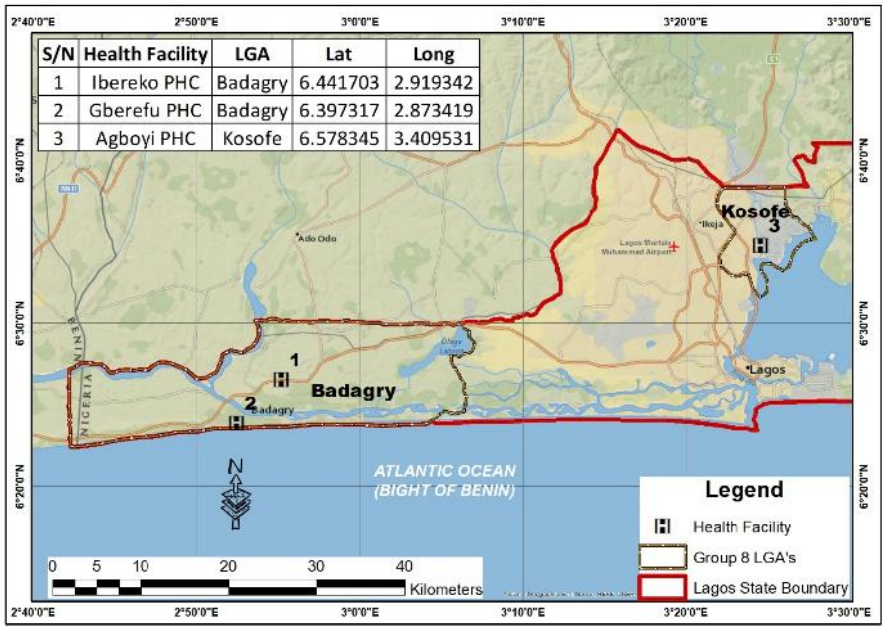


Figure 1.6: Project Locations

Figure 1.7 presents a project status dashboard integrating geospatial information with project-specific data for the Badagry Group 8 Axis. The dashboard includes:

- a map of the inland corridor highlighting the cluster's key focus area,

- a panel listing the four PHC sites and their development status (refurbishment or construction), and
- a data table containing GIS coordinates for each facility.

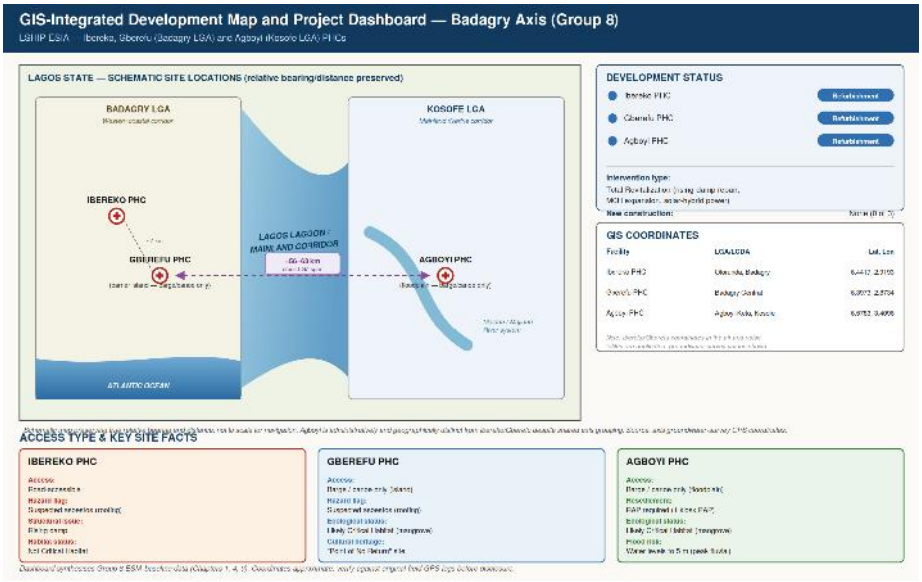


Figure 1.7: GIS-Integrated Development Map and Project Dashboard

Table 1.5: PHC Facilities in the Badagry Axis – Group 8 (Refurbishment)

S/N	Facility	LGA / LCDA	Coordinates (approx.)
1	Ibereko PHC	Olorunda LCDA, Badagry LGA	6.4417, 2.9193
2	Gberefu PHC	Badagry Central, Badagry LGA	6.3973, 2.8734
3	Agboyi PHC	Agboyi-Ketu LCDA, Kosofe LGA	6.5783, 3.4096

Thematic Scope

The thematic scope addresses the multi-dimensional impacts of the project across the following key areas:

- Environmental & Climate Resilience: Monitoring air quality, noise, and soil integrity, with a strong focus on the transition to green energy and climate-resilient engineering tailored to extreme flood and sea-level rise projections.
- Hazardous Materials & Waste: A priority focus on the safe abatement of asbestos during the refurbishment of older PHCs and the institutionalisation of non-burn medical waste management.
- Social Safeguards: Management of risks associated with labour influx in isolated island/riverine settings, specifically the prevention of Gender-Based Violence (GBV) and Sexual Exploitation, Abuse, and Harassment (SEA/SH).
- Occupational & Community Health: Ensuring safety for both workers and the public through standardised health and safety (HSE) protocols, personal protective equipment (PPE), vaccination programs, needle-stick protocols, and enhanced site lighting.
- Digital Health Integration: Scaling digital infrastructure to improve healthcare delivery, patient data management, and maternal/child health tracking across all Group 8 locations.

Exclusions

This ESIA does not cover PHC facilities in other LSHIP clusters:

- Ibeju-Lekki Axis (Group 6): Magbon, Idaso, Idotun
- Badagry Axis (Group 7): APA, Igbogbele, Farasime
- Ikorodu Axis (Group 4): Imota, Baiyeku, Abule Eko, Owutu
- Mainland/Yaba Axis: Ojodu, Otumara, Isolo, Oba Salami, Oridilu
- Other Alimosho/Kosofe-area sites not part of this axis: Bada, Ogbomosotedo



Figure 1.8: Scope for the Badagry Axis

1.5 Regulatory Triggers, ESIA Process Flow and Guiding Principles

1.5.1 Regulatory Triggers

The regulatory triggers applicable to the Lagos State Health Infrastructure Project (LSHIP) define the statutory and safeguard obligations that guide the scope and depth of this ESIA. These triggers arise from Nigerian environmental legislation and the updated African Development Bank (AfDB) Integrated Safeguards System (ISS, 2023), and they determine the level of assessment required for each facility.

Table 1.6 summarizes the specific triggers relevant to the Badagry Axis Group 8, highlighting the regulatory basis and the project implications:

Table 1.6: Comprehensive Regulatory Triggers Applicable to the Project

Trigger	Regulation	Relevance to Group 8 Axis
Environmental Assessment & Major Refurbishments	EIA Act Cap E12 LFN 2004 (Section 2)	Mandatory ESIA across all project sites, specifically governing structural upgrades, rising-damp remediation, and MCH-wing expansions at Ibereko, Gberefu, and Agboyi PHCs.

Mangrove & Critical Habitat Disturbance	NESREA Wetlands Regulations; IFC PS6	Gberefu and Agboyi are both classified as Likely Critical Habitat due to the presence of red mangroves (Rhizophora\ racemosa) and sensitive riparian corridors.
Coastal Erosion & Storm Surge	NESREA Soil Erosion & Flood Control Regulations (2010)	Gberefu (narrow barrier island) requires specialised flood and storm-surge resilience engineering design.
Fluvial Flooding	NESREA Soil Erosion & Flood Control Regulations (2010)	Agboyi floodplain experiences extreme water levels reaching up to 5 meters during peak fluvial flooding, necessitating elevated platform designs.
Hazardous Waste & Asbestos Management	Harmful Waste Act Cap H1 LFN 2004; NESREA Hazardous Waste Regulations	Applicable to all sites requiring refurbishment (such as Ibereko roofing and aged structures at Agboyi and Gberefu) to manage the safe removal, abatement, and disposal of asbestos and hazardous materials.
Climate Resilience	Nigeria Climate Change Act 2021	Relevant to all sites as they transition to solar-hybrid power, integrate flood-resilient infrastructure, and address long-term sea-level rise (0.5-0.8m by 2100).
Waste Management	Lagos State Environmental Law (2017)	Governs the disposal of construction debris and medical waste across all clusters, incorporating the secure "Barge-to-Truck" waste-transfer protocol for Gberefu and Agboyi to prevent environmental contamination of waterbodies.
Social Safeguards	AfDB Integrated Safeguards System (ISS, 2023) Operational	Triggers mandatory assessments for labour influx, GBV/SEA/SH prevention,

	Safeguards (OS1, OS3, OS5, OS6, OS10)	stakeholder engagement, biodiversity protection, and involuntary resettlement.
Involuntary Resettlement	Land Use Act Cap L5 LFN 2004; AfDB ISS (2023) OS5	Governs land-related impacts and economic displacement, specifically addressing the affected commercial kiosk operator at Agboyi via the Project Resettlement Action Plan (RAP).
Labor Standards	Labour Act Cap L1 LFN 2004	Applicable to the management of site workers, ensuring fair wages, safe working conditions, local hiring targets (≥50%), and strict adherence to Codes of Conduct during construction.
Riverine Logistics & Waterway Access	National Inland Waterways Authority (NIWA) Act	Provides regulatory oversight of motorized barge and canoe transport impacts for Gberefu and Agboyi waterborne site access.
International Benchmarking	IFC Performance Standards (PS1–PS8)	Sets global standards for managing environmental and social risks, including resource efficiency, critical habitats, and land acquisition.

These triggers collectively justify the axis's classification as AfDB Category 1 and FMEnv Category I, requiring a full, comprehensive ESIA.

Key Axis Considerations

- **Cross-Jurisdictional Composition:** Unlike other clusters, Group 8 spans two local government jurisdictions (Badagry LGA and Kosofe LGA / Agboyi-Ketu LCDA), requiring coordinated multi-agency engagement across both regions.
- **Site Specificity:** The axis is uniquely defined by mangrove/Likely Critical Habitat ecosystems (Gberefu, Agboyi) and significant structural deterioration (rising damp, wall cracks across Ibereko, Gberefu, and Agboyi), making biodiversity protection and hazardous-materials management primary regulatory triggers.

- **Logistics Constraints:** Waterborne-only access to Gberefu and Agboyi triggers National Inland Waterways Authority (NIWA) Act oversight and specialised transport-safety regulations not required at road-accessible axes.
- **Resettlement Obligations:** Group 8 involves specific land-related impacts requiring formal RAP implementation, notably for the commercial kiosk operator affected at Agboyi.

1.5.2 ESIA Process Flow

Figure 1.9 presents the Environmental and Social Impact Assessment (ESIA) process required to achieve regulatory compliance under the FMEnv EIA Act CAP E12 LFN 2004 and the AfDB Integrated Safeguards System (ISS). The process follows a structured and sequential pathway designed to ensure that environmental and social risks are identified early, assessed rigorously, and managed effectively.

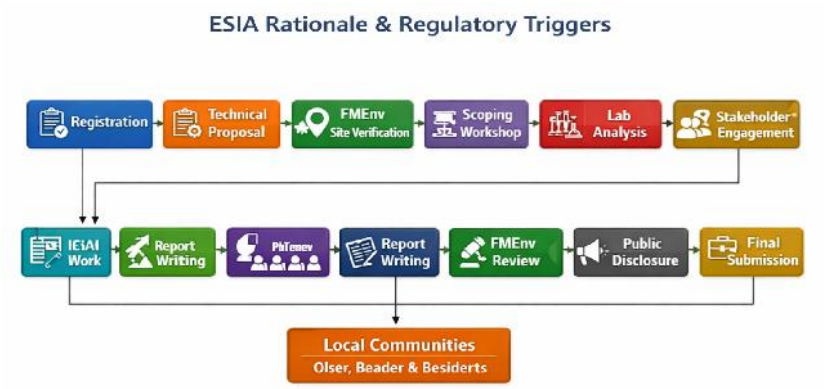


Figure 1.9: ESIA Process Flowchart

The ESIA process comprises the following steps:

- Registration with FMEnv
- Technical Proposal Submission
- FMEnv Site Verification
- Scoping Workshop and stakeholder engagement
- Fieldwork and Data Collection
- Laboratory Analysis
- Report Writing and Draft ESIA Submission

- FMEnv Review and Panel Assessment
- Public Disclosure (21 days FMEnv; 120 days AfDB)
- Final Submission
- Issuance of EIA Certificate

1.5.3 Guiding Principles

The LSHIP is guided by a set of core principles that shape all phases of planning, assessment, construction, and operation. These principles are consistent with the IFC Performance Standards, the AfDB Integrated Safeguards System, and global best practice for sustainable healthcare infrastructure.

- Sustainability – Integrating environmental, social, and economic considerations, including green building design, local hiring, and long-term facility resilience.
- Precautionary Principle – Where uncertainty exists, the project adopts a conservative approach (e.g., asbestos surveys prior to demolition; treating wetlands as potential Critical Habitat until confirmed otherwise).
- Mitigation Hierarchy – Applying the sequence: Avoid → Minimise → Restore → Offset.
- Inclusiveness – Ensuring equitable access and participation for women, persons with disabilities, youth, riverine communities, and informal settlers.
- Transparency – Ensuring public disclosure of ESIA documents (21 days FMEnv; 120 days AfDB), including a Non-Technical Summary in English and Yoruba.
- Accountability – Enforcing contractor obligations, Independent Environmental and Social Monitor (IESM) audits, and sanctions for non-compliance.
- Polluter Pays Principle – Contractors bear full responsibility for spill response, waste disposal, and site restoration.
- Continuous Improvement – Annual ESMP reviews informed by monitoring data, incident reports, and lessons learned.

1.5.4 Field Data Gathering and Attestation

In compliance with FMEnv requirements, the field data gathering for this ESIA was conducted with the participation and oversight of officials from the Federal Ministry of Environment. This ensures that the baseline data and environmental assessments meet the regulatory standards required for EIA Certificate issuance by FMEnv Abuja. Below are the Field Data Gathering details:

Table 1.7: Field Data Gathering Details

Item	Details
Dates of Field Work	1st April to 9th April, 2026 (Wet Season)
Season	Wet Season
FMEnv Oversight	Confirmed
Sampling Points	3 per PHC site (12 sampling points total)
Parameters Sampled	Air quality, noise, groundwater, soil, vegetation, socio-economic

The following government officials from the Federal Ministry of Environment, Lagos State Ministry of Environment and Water Resources participated in the field data gathering and Stakeholders engagement meetings:

S/N	Name	Position
1	Okwesa Francesca	FMEnv., Abuja (Representative of the Hon. Minister of Environment)
2	Adenaike Olubunmi	FMEnv Lagos Office, (Controller)
3	Oshimowo T. Bolaji	Lagos State Ministry of Environment & Water Resources
4	Oyawoye Anuoluwa	Lagos State Ministry of Environment & Water Resources
5	Shittaboy Tolulope	FMEnv, Zonal Office Lagos
6	Kehinde Biok T	FMEnv, Zonal Office Lagos
7	Eberechukwu E.U	FMEnv, Zonal Office Lagos
8	Engr. Braimoh	Lagos State Primary Healthcare Board

1.6 Policy, Legal & Institutional Framework

This ESIA has been prepared in accordance with:

- Primary Framework: AfDB Integrated Safeguards System (ISS) 2023/2024 (Operational Safeguards OS1-OS10)
- National Regulatory Framework: FMEnv EIA Act CAP E12 LFN 2004, NESREA Regulations, Lagos State Environmental Laws
- Complementary Good Practice: IFC Performance Standards (PS1-PS8), Equator Principles IV, WHO Guidelines, ILO Conventions

Note: Where national regulations are less stringent than the AfDB ISS 2023/2024, the Bank's standards shall take precedence to ensure full compliance.

1.6.1 Nigerian Federal Framework

Table 1.8 summarises the key federal laws and regulations applicable to LSHIP. Where national law is silent or weaker, AfDB standards apply.

Table 1.8: Nigerian Federal Regulatory Framework

Law / Regulation	Key Provisions	Relevance to Group 8	Compliance Action
EIA Act Cap E12 LFN 2004	Section 2 – Mandatory EIA for prescribed activities; Category I designation.	Project triggers Category I (mandatory full EIA) due to major structural upgrades and construction in sensitive/wetland areas across the 3 sites.	Registration (Form EIA 1) submitted; ESIA prepared; public disclosure to follow; EIA Certificate to be obtained.
NESREA Act 2007	Enforcement of air, water, noise, waste standards.	Construction and operation must meet NESREA limits, specifically protecting the sensitive Badagry Creek and Kosofe waterways.	Monitoring plan includes NESREA limits; exceedances trigger corrective action.
National Environmental (Air Quality Control) Regulations, 2021	Limits for PM2.5 (25 µg/m³), PM10 (50 µg/m³), NO2 (40 µg/m³), SO2 (20 µg/m³), CO (10 mg/m³).	Dust from earthworks, generator operation, and motorized barge emissions at Gberefu and Agboyi.	Water spraying, covered trucks, well-maintained marine engines, low-sulphur diesel, real-time monitoring.
National Environmental (Noise Standards and Control) Regulations, 2009	Residential day 55 dB(A), night 45 dB(A); Commercial 65/55; Industrial 70/60.	Construction noise near schools (Ibereko) and clustered residential enclaves (Agboyi/Gberefu).	Restrict hours (7:00–18:00), temporary acoustic barriers, community notification.

National Environmental (Surface and Groundwater Quality Control) Regulations, 2011	pH (6.5–8.5), BOD (6 mg/L), coliforms (0 CFU/100ml), iron (0.3 mg/L), copper (0.01 mg/L).	High risk of wastewater/stormwater runoff into surrounding creeks and mangroves at Agboyi and Gberefu.	No untreated discharge; use of silt fences; sealed septic tanks; barge spill-prevention kits.
National Environmental (Sanitation and Wastes Control) Regulations, 2009	Proper waste management, segregation, storage; prohibition of open burning.	Management of construction debris and medical waste across riverine and mainland sites.	Waste Management Plan; HMWMP; LAWMA collection via waterborne logistics.
Harmful Waste Act Cap H1 LFN 2004	Prohibits dumping of harmful waste; criminal penalties.	Identification and removal of asbestos at older structures across all 3 sites; infectious medical waste.	Licensed asbestos abatement; double-bagging; labeled transport; hazardous waste landfill disposal.
Land Use Act Cap L5 LFN 2004	Sections 28-30 – Compulsory acquisition, compensation; Section 36 – Occupation without title.	Economic displacement identified at Agboyi (commercial kiosk operator).	Resettlement Action Plan (RAP) prepared with compensation at full replacement cost and livelihood restoration prior to works.
National Inland Waterways Authority (NIWA) Act	Regulation of inland waterway navigation, safety, and infrastructure.	Exclusive waterborne access to Gberefu and Agboyi requires strict oversight of motorized barge and canoe transport.	NIWA clearances for barges; mandatory life jackets for all workers/materials

			transit; designated safe docking zones.
Violence Against Persons (Prohibition) Act 2015	Prohibits sexual violence, exploitation, harassment.	GBV/SEA/SH risks amplified by labour influx in isolated island/riverine communities (Gberefu, Agboyi).	GBV Action Plan; mandatory Code of Conduct; referral pathways; survivor-centered response mechanisms.
National Biosafety Management Agency Act 2015	Biosafety permits, containment measures.	While LSHIP features higher-level labs elsewhere, Group 8 PHCs handle standard primary biomedical waste.	Standard Infection Prevention and Control (IPC); standard HMWMP execution.
Child Rights Act 2003	Prohibits child labour; fixes 18 years as the age of majority.	Risk of engaging minors as casual labor or canoe operators during construction.	Contractor CESMP to mandate age verification (National ID/voter card); strict prohibition on under-18 workers.
Labour Act CAP L1 LFN 2004	Regulates terms of employment, wages, working hours; prohibits forced labour.	Governs engagement of site workers, especially local hires from Agboyi, Gberefu, and Ibereko.	Written contracts; Labour Management Plan; workers' grievance mechanism; equal pay standards.
Employee's Compensation Act 2010	Compensation for occupational injuries, disease, or death.	Marine transit risks and construction hazards require robust worker protection.	Contractor registration with NSITF/ECA scheme; comprehensive OHS Plan; incident reporting.

Endangered Species Act CAP E9 LFN 2004	Conserves protected wild fauna and flora.	Site clearing near Likely Critical Habitats (red mangroves at Agboyi and Gberefu).	Biodiversity screening; strict "no-go" buffer zones around mangroves; chance-find procedures for aquatic species.

1.6.2 State-Level Environmental Permit Requirements

Table 1.5 provides a summary of the key environmental permits and approvals required at the state level for the implementation of the LSHIP, identifying the responsible regulatory agencies, the specific permits or clearances to be obtained, and the corresponding status or actions needed to achieve compliance.

Table 1.9 provides a summary of the key environmental

Responsible Agency	Required Permits / Approvals	Status / Action for Group 8
LASEPA (Lagos State Environmental Protection Agency, 2017)	State EIA concurrence; waste management permit; water abstraction permit; air quality permit; asbestos abatement permit.	To be obtained prior to construction. Specific focus on asbestos abatement permits for Ibereko, Gberefu, and Agboyi older structures.
LAWMA (Lagos State Waste Management Authority, 2019)	Waste collection agreement; medical waste disposal agreement; hazardous waste manifest system.	Mandatory "Barge-to-Truck" manifest system must be executed to ensure safe waterborne collection of medical waste from Gberefu and Agboyi without creek contamination.
Lagos State Ministry of Physical Planning (2022)	Building plan approval; planning permit.	Must specifically approve elevated platform designs required for Agboyi's 5-meter flood risk and Gberefu's storm surge resilience.
LASWARCO (Lagos State Water	Borehole drilling permit; water abstraction license.	To be obtained for any new boreholes, ensuring groundwater salinity/quality checks at coastal sites.

Regulatory Commission, 2018)		
LSSC (Lagos State Safety Commission, 2011)	Construction-site safety registration and Safety Compliance Certification.	Register all 3 sites; Contractor CESMP/OHS Plan must cover specific marine/barge safety protocols for waterborne sites.

The Contractor shall obtain all state-level permits prior to commencement of activities in each respective LGA.

1.6.3 AfDB Operational Safeguards (OS1-OS10) – Group 8 Triggers

Table 1.10 provides a summary of the African Development Bank's Operational Safeguards (OS1–OS10) triggered by the LSHIP, outlining the key safeguard requirements and describing how each applies to the project's design, implementation, and risk-management framework.

Table 1.10: AfDB Operational Safeguards Triggered (ISS 2023/2024)

AfDB Operational Safeguard (ISS 2023)	Key Safeguard Requirements / Context	Compliance Action / Mitigation Measure for Group 8
OS1: Environmental & Social Assessment	**Triggered:** Category 1 requires full ESIA with stakeholder engagement, alternatives analysis, and ESMP.	Full ESIA prepared for Agboyi, Gberefu, and Ibereko facilities, addressing multi-jurisdictional (Badagry & Kosofe LGAs) and aquatic impacts.
OS2: Labour & Working Conditions	**Triggered:** Fair labour conditions; OHS; prohibition of child/forced labour.	Occupational hazards—including water-transit risks at Agboyi and Gberefu—require contractor OHS measures, marine safety protocols (lifejackets), and Codes of Conduct.
OS3: Resource Efficiency & Pollution Prevention	**Triggered:** Pollution prevention hierarchy; hazardous materials; waste management.	Execution of safe asbestos removal and the "Barge-to-Truck" medical waste protocol to prevent pollution of sensitive mangrove ecosystems and waterways.

OS4: Community Health, Safety & Security	**Triggered:** Community health and safety; GBV/SEA/SH prevention; traffic safety.	Community interface risks in isolated island contexts require Waterway Traffic Management Plans and robust GBV/SEA/SH risk mitigation.
OS5: Land Acquisition, Restrictions on Land Use & Involuntary Resettlement	**Triggered:** Avoid/minimise resettlement; where unavoidable, prepare RAP.	Implementation of the formal Resettlement Action Plan (RAP) for the economically displaced commercial kiosk operator at the Agboyi site.
OS6: Biodiversity & Ecosystem Services	**Triggered:** Avoid critical habitat; demonstrate no net loss.	Gberefu and Agboyi are classified as Likely Critical Habitat due to red mangroves (Rhizophora racemosa). Buffer zones and zero-discharge policies into creeks are mandatory.
OS7: Indigenous Peoples	**Not Triggered:** Screening confirms no groups meeting the AfDB criteria for Indigenous Peoples are present in Group 8.	No specific mitigation required under this OS. Standard community engagement applies under OS10.
OS8: Cultural Heritage	**Triggered:** Protection of tangible and intangible heritage.	Strict Chance Finds Procedure during earthworks. Direct consultation required regarding Gberefu's historic "Point of No Return" and "Spirit Attenuation Well," as well as local sacred grounds.
OS9: Financial Intermediaries	**Not Triggered:** Direct investment infrastructure project.	Not applicable.
OS10: Stakeholder Engagement & Information Disclosure	**Triggered:** Meaningful, continuous consultation; accessible GRM.	Implementation of a comprehensive Stakeholder Engagement Plan (SEP) targeting traditional leaders, fishers, and

		boat operators, alongside a localized Grievance Redress Mechanism (GRM).

Assessment and Management of Environmental & Social Risks (AfDB OS1–OS10)

Figure 1.10 illustrates the Environmental and Social (E&S) Risk Assessment and Management Framework adopted for the Lagos State Health Infrastructure Project (LSHIP) – Badagry Axis, in alignment with the African Development Bank's Integrated Safeguards System (ISS, 2024).

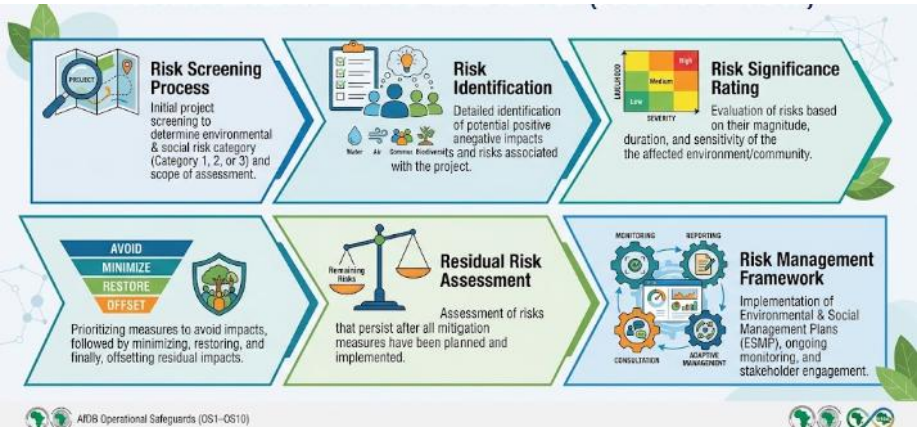


Figure 1.10: Assessment and Management of Environmental & Social Risks (AfDB OS1–OS10)

The framework reflects a structured, multi-stage process consisting of Risk Screening, Risk Identification, Risk Significance Rating, Mitigation Hierarchy Application, Residual Risk Evaluation, and Risk Management Planning. This process ensures that all environmental and social risks associated with the four PHC facilities (Gberefu, Ibereko, and Agboyi) are systematically assessed and managed in accordance with AfDB OS1–OS10.

The figure depicts the following components:

1. Risk Screening (OS1 – Environmental & Social Assessment)

Initial screening determines the project's risk category (AfDB Category 1) based on potential impacts on the environment, communities, labour, biodiversity, and public health. Screening identifies sensitive receptors, vulnerable groups, and potential high-risk activities such as construction works, medical waste handling, and groundwater abstraction.

2. Risk Identification (OS1, OS3, OS4, OS5, OS9)

Commented [SA13]: How about OS2, OS6, OS7 & OS8

Commented [Ma14R13]: These safeguards are fully integrated into the project risk matrix and framework (detailed in Table 1.6 of the document

Commented [SA15]: This is for Financial Intermediaries

Commented [Ma16R15]: The Lagos State Health Infrastructure Project (LSHIP) is structured as a direct infrastructure investment rather than a financial intermediary project.

This step identifies all potential E&S risks across project phases:

- Air emissions, noise, vibration
- Soil and groundwater contamination
- Medical and hazardous waste generation
- Community health and safety risks
- Labour and working conditions
- Biodiversity disturbance
- GBV/SEA/SH risks
- Climate vulnerability and resilience gaps

3. Risk Significance Rating

Risks are evaluated using a likelihood–severity matrix, assigning significance levels (Low, Medium, High, and Very High). This rating guides prioritization of mitigation measures and monitoring requirements.

4. Mitigation Hierarchy (OS1–OS10)

The ESIA applies AfDB's mitigation hierarchy:

- Avoid – redesign, site adjustments, tree retention, avoiding sensitive receptors
- Reduce – engineering controls, noise barriers, dust suppression, drainage upgrades
- Mitigate – medical waste treatment systems, septic upgrades, PPE, GBV Action Plan
- Offset/Compensate – tree replacement, livelihood restoration (where applicable)

5. Residual Risk Assessment

After mitigation measures are applied, residual risks are reassessed to confirm that impacts fall within acceptable thresholds under AfDB ISS. Residual risks inform the ESMP monitoring indicators and corrective action procedures.

6. Risk Management Framework (OS1–OS10)

The final component integrates all risk outcomes into a comprehensive E&S Management Framework, including:

- ESMP implementation
- Contractor ESMS requirements
- Monitoring and reporting schedules
- Institutional roles and responsibilities
- Grievance Redress Mechanism (GRM)

- GBV/SEA/SH Action Plan
- Emergency Preparedness and Response Plan (EPRP)

1.6.4 International Good Practice Standards

Where Nigerian law is silent or weaker, the following international standards are adopted (International Finance Corporation, 2012; World Health Organization, 2014; International Labour Organization, 2019; Equator Principles Association, 2020; United Nations, 2011; Task Force on Climate-related Financial Disclosures, 2017):

- IFC Performance Standards (PS1-PS8) and EHS Guidelines
- WHO Safe Management of Wastes from Health-Care Activities (2nd Edition, 2014)
- WHO Core Components of Infection Prevention & Control
- ILO Conventions 155, 161, 187, 148, and core labour standards
- Equator Principles IV (EP4)
- UN Guiding Principles on Business and Human Rights (UNGPs)
- Task Force on Climate-related Financial Disclosures (TCFD)

1.7 Contractor Environmental and Social Management System (ESMS) Requirements

All contractors must comply with the following ESMS components. These requirements will be included in bidding documents and contracts (African Development Bank, 2023; International Finance Corporation, 2012).

- Contractor Environmental and Social Management Plan (CESMP) – Dust control, noise management, water quality protection, waste management (including hazardous), spill prevention, erosion control, labour influx management, OHS plan, GBV Code of Conduct, community liaison, GRM.
- Occupational Health and Safety – PPE, training, medical surveillance, incident reporting, first aid, fire safety (International Labour Organization, 1981).
- Labour Management – Written contracts, prohibition of child/forced labour, non-discrimination, timely payment, worker accommodation standards, worker GRM (International Labour Organization, 1998).
- Community Safety – Traffic Management Plan, access management, fencing, community liaison, emergency response.

Commented [SA17]: The contractor's CESMP should detail all the below listed.

Commented [Ma18R17]: This is reflected in **Figure 1.7: Contractor Compliance Requirements for ESMS Components**

- GBV/SEA/SH Prevention and Response – Code of Conduct (signed by all workers), induction and monthly training, confidential reporting channels, survivor-centered response, sanctions (International Finance Corporation, 2020).
- Waste Management – Segregation, asbestos abatement (licensed), hazardous waste disposal, waste manifests.
- Security Management – VPSHR training, proportional use of force, incident reporting (Voluntary Principles on Security and Human Rights, 2000).
- Reporting – Weekly E&S reports to PIU, incident reports within 24 hours.

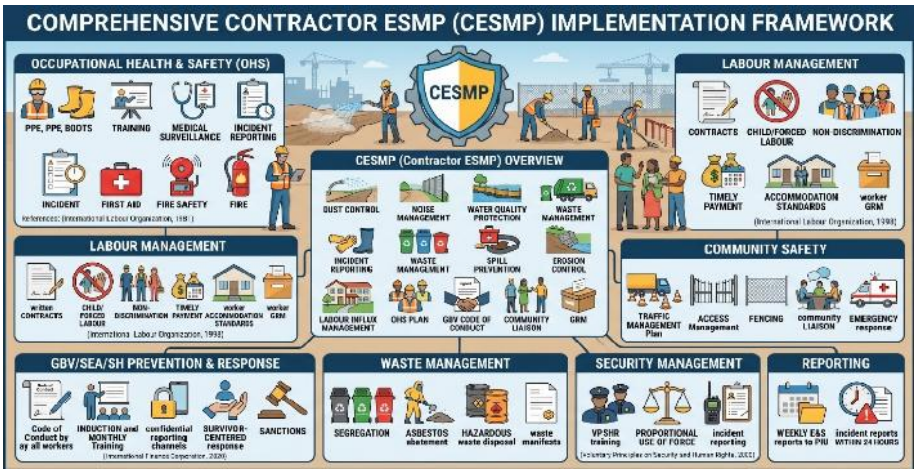


Figure 1.11: Contractor Compliance Requirements for ESMS Components

1.8 Project Risk Categorisation

FMEnv Category I – Mandatory full EIA due to programme scale, sensitivity (wetlands, mangroves – including Gberefu and Agboyi), magnitude of impacts (resettlement at Agboyi, asbestos at Ibereko/Gberefu, labour influx), and cumulative impacts.

AfDB Category 1 (High Risk) – Confirmed by the December 2025 Identification Mission, based programme-wide on:

1. Multi-site complexity (29 facilities)
2. Involuntary resettlement at 6 sites (>200 PAPs at Agboju; 2 PAPs at Agboyi)

3. Environmentally sensitive sites (mangrove/Critical Habitat at Gberefu; floodplain at Agboyi)
4. Lack of dedicated E&S capacity within the PIU
5. Water crossings requiring boat transport (Gberefu, Agboyi) – this criterion is met entirely within the Group 8 axis
6. Asbestos at 9 sites (including Ibereko and Gberefu)

IFC Category A mirrors AfDB Category 1. Equator Principles IV Category A requires independent ESIA, TCFD-aligned climate risk assessment, human rights due diligence, IESM monitoring, and 120-day public disclosure.

1.9 Involuntary Resettlement Integration (OS5/PS5)

1.9.1 RAP Requirements – Programme-Wide Context

Of the five programme-wide sites requiring standalone RAPs, one falls within the Group 8 Axis:

Site	PAPs	Affected Assets	RAP Status
Agboyi (Kosofe)	2 commercial kiosk	Commercial structure, water-locked access	Full RAP required

1.9.2 Livelihood Restoration Framework

For the Agboyi PAPs, the RAP will include: transfer via Bank compensation at full replacement cost (independent valuation, no depreciation); transitional support (moving allowance, rental assistance 6-12 months); livelihood restoration (business grant/skills training appropriate to a commercial kiosk operator); vulnerability support if applicable; GRM access; and monitoring and evaluation. No land acquisition or site clearing at Agboyi may occur before compensation is verified by an independent monitor.

1.9.3 RAP Coordination and Documentation (Badagry Axis – Group 8)

Unlike the Ibeju-Lekki Axis (Group 6), where no resettlement is triggered at any site, Group 8 requires a standalone RAP for one site:

RAP Status Confirmation:

Site	**PAP Category**	**Number of PAPs**	**Affected Assets**	**RAP Status**
Ibereko	None	0	None	Not required
Gberefu	None	0	None	Not required

Agboyi	Commercial (kiosk operator)	2	Commercial kiosk, water-locked access	RAP required
Axis Total	–	2	–	1 site requires RAP

Key Safeguard Commitments (AfDB OS5 / IFC PS5 Compliant):

- Limited Land Acquisition: Works at Ibereko and Gberefu within existing PHC boundaries; Agboyi requires the two kiosk relocation.
- Livelihood Protection & Restoration Plan (LRP): Fishing, farming, and trading livelihoods are protected through site-specific mitigation measures and a dedicated Livelihood Restoration Plan (LRP) to address any potential economic displacement.
- Community Engagement: Continuous consultation with the Obas and Baales of Agboyi, Gberefu, and Ibereko.
- Full Replacement Cost Compensation: Before any site clearing at Agboyi.
- Grievance Redress: Tiered GRM available for any project-related concerns, with traditional rulers as first point of contact.

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Commented [Ma20R19]: Addressed

1.10 Climate Alignment (Paris Agreement, TCFD, Nigeria's NDC)

1.10.1 Climate Hazard Mapping

The key climate-related hazards identified across the 29 project sites, highlighting locations with elevated exposure and presenting projected changes under the 2050 high-emissions scenario (RCP 8.5) (Nigerian Meteorological Agency, 2024; Intergovernmental Panel on Climate Change, 2021; Nigerian Institute for Oceanography and Marine Research, 2023) is presented below and Figure 1.8:

Table 1.11 Climate Hazard Mapping

Hazard	High-Risk Sites	Projected Change (2050, RCP 8.5)
Flooding (pluvial and fluvial)	Bada, Isolo, Agbowa, Orimedu, Idotun, Farasime, Agboyi, Owutu, Oke Ogbe	+30% rainfall intensity; 1:100-year storm becomes 1:30-year
Coastal erosion / sea-level rise	Orimedu, Idotun, Gberefu, APA, Ibeju-Lekki Axis West, Ibeju-Lekki GH	Sea-level rise 0.2-0.5 m (2050); the axis's own long-term assessment extends this to 0.5-0.8 m by 2100

Heatwaves	All urban sites	+2-3 C; >40 C days increase from 10/year to 60/year
Extreme rainfall / storms	All sites	+20-30% intensity

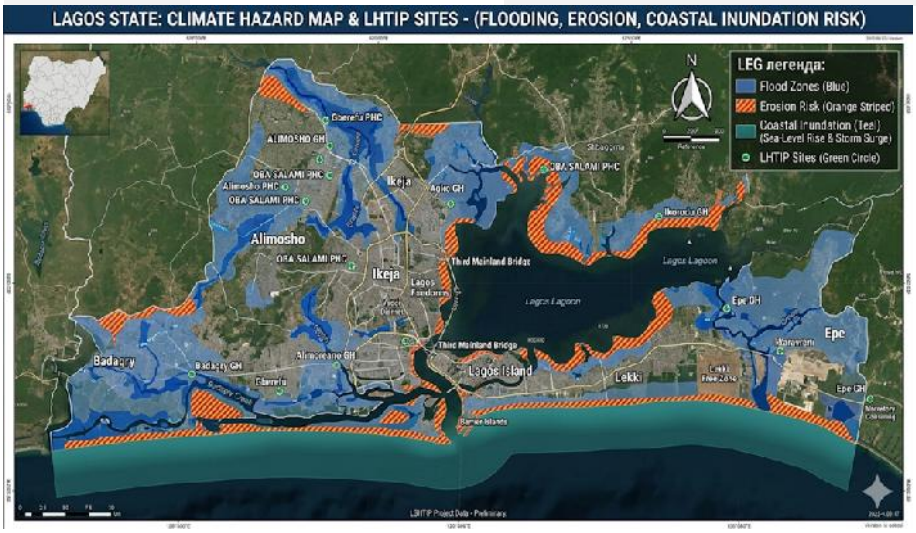


Figure 1.12: Map of climate hazards (flooding, erosion, coastal inundation)

Figure 1.12 presents a composite climate-hazard map of Lagos State, illustrating areas exposed to flooding, erosion, and coastal inundation, overlaid with the locations of the LSHIP project sites to support spatial risk screening and climate-resilience planning.

Agboyi's fluvial flood risk (water levels to 5 m during peak flooding) and Gberefu's coastal erosion/SLR exposure are independently confirmed in both this programme-wide table and the axis's own baseline assessment – consistent cross-referencing between the programme Chapter 1 and the Group 8-specific findings.

1.10.2 Adaptation Measures (Climate-Resilient Design)

All construction will be climate smart and are designed to address the ongoing and projected climate change issues. The facilities will incorporate (Task Force on Climate-related Financial Disclosures, 2017; Federal Ministry of Environment, 2021):

- Oversized culverts and drainage – designed for 1:100-year storm + 30% climate factor.
- Elevated electrical panels – placed above projected flood levels.

- Flood-proofing – elevated floor slabs where needed, flood barriers for critical equipment.
- Cool roofs – reflective coating, heat-resistant materials.
- Water security – rainwater harvesting (5,000-10,000 L storage per PHC), borehole with UV filtration.
- Energy resilience – Solar PV + battery storage (24-48 hours backup).

1.10.3 Alignment with Nigeria's NDC

Nigeria's NDCs commit to climate-resilient infrastructure and a 20% (47% conditional) unconditional GHG reduction by 2030 (Federal Ministry of Environment, 2021). LSHIP aligns to the Nigeria NDC mitigation and adaptation strategies through construction of climate smart structures that enhance resilience and reduce greenhouse gas emission. Practical construction plan includes, oversized drains, elevated electricals, solar PV (2,000-- 4,000 tCO2e/year reduction), and energy-efficient design.

1.11 Gender, Inclusion & Vulnerability Framework

1.11.1 Gender Analysis & GBV Risk Screening

The programme-wide gender analysis identifies GBV/SEA/SH risk as High at Agboju, Ogba, Otumara, Isolo, Agboyi, and Gberefu due to labour influx, poor lighting, isolated paths, economic vulnerability, and lack of confidential reporting mechanisms. Two of the Group 8 axis's three facilities – Agboyi and Gberefu – are named among this programme-wide High-risk list, independently corroborating the axis's own GBV risk assessment. Ibereko is not separately named in this programme-wide list, though the axis-level ESMP applies the same GBV Action Plan and Code of Conduct requirements to all three facilities as a matter of consistent practice.

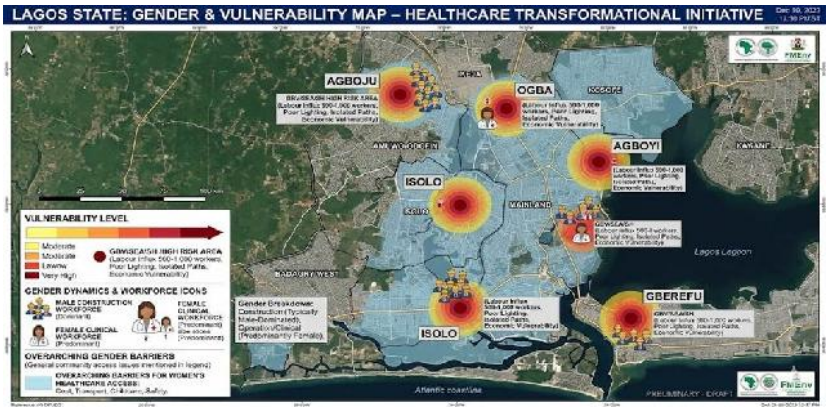


Figure 1.13 – Gender and Vulnerability Map

1.11.2 AfDB OS4 – GBV/SEA/SH Compliance

The LSHIP is fully aligned with AfDB Operational Safeguard 2 (OS2) – Labour, Working Conditions, and Community Health & Safety OS4 (ISS 2023/2024), which includes specific requirements for:

1. GBV/SEA/SH Prevention and Response – Zero-tolerance policy; Code of Conduct; training; confidential reporting; survivor-centered response; referral pathways; sanctions.
2. Gender Mainstreaming – Gender analysis; gender-balanced hiring; gender-sensitive facility design; gender-inclusive stakeholder engagement.
3. Protection of Vulnerable Groups – Children, elderly, persons with disabilities, informal settlers, riverine/island communities.
4. Labour Influx Management – Local hiring; worker accommodation standards; community liaison; health services.

Table 1.9 outlines the key gender and inclusion indicators that will be monitored throughout the implementation of the LSHIP. These indicators support the project's commitment to gender equity, social inclusion, and the protection of vulnerable groups, providing measurable targets and a framework for ongoing monitoring and reporting.

Table 1.12: LSHIP Alignment with AfDB OS4 GBV/SEA/SH Requirements

OS4 Requirement	LSHIP Compliance Action	Evidence
Code of Conduct	Mandatory for all workers, subcontractors, security personnel	Appendix 13; Chapter 9
GBV/SEA/SH Training	Induction training + monthly refreshers	Chapter 9, Section 9.9.2
Confidential Reporting	Hotline, suggestion boxes, female GRM focal points, anonymous options	Chapter 9, Section 9.10.2
Survivor-Centered Response	Confidentiality, safety, respect, no retaliation, informed consent	Chapter 9, Section 9.10.1
Referral Pathways	Medical (PEP within 72 hours), psychosocial, legal, shelter	Chapter 9, Section 9.10.3
Sanctions	Warning, suspension, termination, legal prosecution	Chapter 9, Section 9.6

Commented [SA21]: Revise to reflect the appropriate OS

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Gender-Balanced Hiring	≥50% female clinical staff, ≥30% female administrative staff	Chapter 1, Table 1.12
Disability-Friendly Design	Ramps, wide doorways, accessible toilets, braille signage	Section 3.3.2

Table 1.13: Gender and Inclusion Indicators

Indicator	Target	Monitoring
Female staff in new PHCs	≥50% clinical, ≥30% administrative	Quarterly
Disability-friendly features in all new/refurbished PHCs	100%	Pre-operation inspection
GBV/SEA/SH cases reported and responded	100% within 48 hours	Monthly
Women participating in consultations	≥40% of participants	Per consultation
Vulnerable PAPs receiving enhanced support	100%	RAP monitoring
Local hiring (within LGA)	≥50% of unskilled labour	Monthly contractor report

1.12 Environmental and Social Management and Institutional Leadership

The LSHIP operates within a clearly defined institutional framework that establishes reporting lines, decision-making authority, and communication channels for effective project implementation. The leadership structure is designed to ensure accountability, transparency, and timely resolution of environmental and social issues across all PHC sites.

A. Project Governance Structure

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Commented [Ma24R23]: Addressed - included

The Lagos State Ministry of Health provides sectoral oversight and policy leadership. The Primary Health Care Board manages the PHC network, which has been decentralised into six Health Districts to bring healthcare closer to the people. The Project Implementation Unit (PIU) coordinates project delivery, having successfully implemented multiple health infrastructure projects between 2021–2025, including the New Massey Street Children's Hospital, General Hospital Ojo, and Ketu-Ejirin Psychiatry Hospital. Table 1.14 shows the project governance structure comprising the levels of different entities.

Table 1.14 The project governance structure comprises the following levels:

Level	Entity	Role	Key Responsibilities
Financing Institution	African Development Bank (AfDB)	Oversight & Supervision	FMEnv) - Approve safeguard instruments - Conduct supervision missions - Review monitoring reports - Enforce covenants
Regulatory Oversight (Federal)	Federal Ministry of Environment (FMEnv) & National Environmental Standards and Regulations Enforcement Agency (NESREA)	Regulatory Authority	- Issue EIA Certificate - Review ESIA and ESMP - Conduct compliance inspections - Enforce EIA Act **NESREA:** Enforce national environmental standards (air, water, noise, waste) Conduct regulatory compliance monitoring
Regulatory Oversight (State)	LASEPA, LAWMA, HEFAMAA	Regulatory Authority	- State EIA concurrence - Issue environmental permits - Waste management oversight - Healthcare facility accreditation
Implementing Agency	Lagos State Ministry of Health (LSMoH)	Project Execution	- Overall project management - Policy direction - Resource allocation
Project Management	Project Implementation Unit (PIU)	Day-to-Day Management	- ESMP implementation oversight - Contractor management - Stakeholder engagement - GRM

			management - Reporting to AfDB and FMEnv
Execution	Contractors	Construction & Refurbishment	- CESMP implementation - Environmental monitoring - Worker management - Community liaison - Incident reporting
Independent Oversight	Independent Environmental & Social Monitor (IESM)	Third-Party Monitoring	- Quarterly audits - Compliance verification - Direct reporting to AfDB
Community Representation	Traditional Institutions, CDAs, Community Liaison Officers	Community Interface	- Community entry facilitation - Stakeholder engagement - GRM (community-level) - Cultural heritage protection

B. Reporting and Communication Lines

Figure 1.14 establishes the communication channels for environmental and social management across the LSHIP.

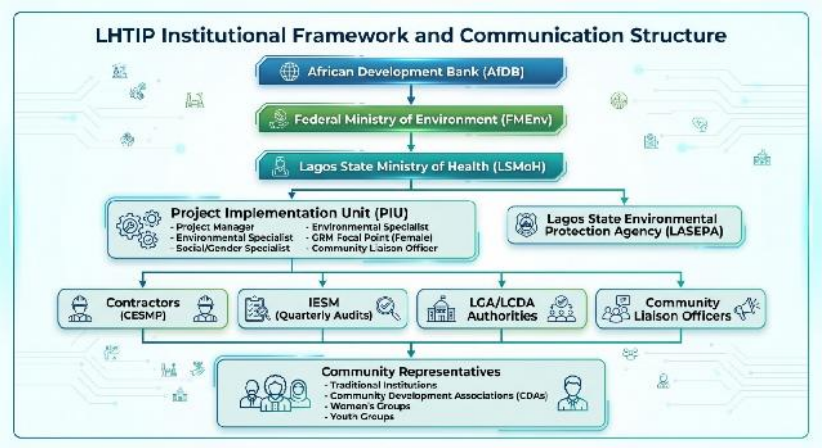


Figure 1.14: LSHIP Institutional Framework and Communication Structure

The institutional structure shown above is cross-referenced in Chapter 7 (ESMP) under institutional arrangements and in Chapter 9 (SEP) under communication and grievance redress mechanisms. It also supports AfDB OS10 by defining clear engagement and escalation pathways between the PIU, PMU, CLO, and community representatives.

Grievances from community members flow from the Community Representatives to the CLO, then to the Contractor, PMU, and PIU. Unresolved grievances escalate to LASEPA and FMEnv, and ultimately to AfDB's Independent Recourse Mechanism (IRM) if required. Detailed grievance procedures and communication protocols are provided in Chapter 9 (Stakeholder Engagement Plan).

Table 1.15. Communication Channels for Environmental and Social Management

Communication Type	Channel	Frequency	Responsible
Grievance Redress	- Toll-free hotline [TBD] - Suggestion boxes at PHCs - Female GRM Focal Point - Community Liaison Officers - PIU Safeguards Team	Ongoing	PIU / Contractors
Community Engagement	- Town hall meetings - Focus Group Discussions - Community Liaison Officers - Traditional institutions	Quarterly	PIU / CLOs
Project Reporting	- Contractor → PIU: Weekly E&S reports - PIU → AfDB: Monthly E&S reports - PIU → FMEnv: Annual ESMP reports - IESM → AfDB: Quarterly audit reports	As scheduled	Contractors / PIU / IESM
Incident Reporting	- Contractor → PIU: Within 24 hours - PIU → AfDB: Within 48 hours (serious incidents)	As needed	Contractors / PIU
Permitting & Compliance	- Contractor → LASEPA: As required - PIU → FMEnv: As required by EIA Certificate	As needed	Contractors / PIU

Commented [SA25]: Monthly reporting

Commented [Ma26R25]: Addressed

D. Community Liaison Structure

Table 1.16 The following community liaison structure is established for each PHC site:

Table 1.16 community liaison structure

Level	Position	Role
Site Level	Site Community Liaison Officer (Contractor)	- Daily community interface - Advance notification of activities - Respond to community inquiries - Report grievances to PIU
Community Level	Traditional Leaders (Obas, Baales)	- Community entry facilitation - Cultural guidance - Grievance resolution (Level 1)
Community Level	CDA Chairpersons	- Community representation - Local hiring coordination - Feedback collection
LGA Level	LGA Environmental Health Officer	- Local regulatory liaison - Community health monitoring - Permit coordination
PIU Level	PIU Community Liaison Officer	- Overall community engagement coordination - GRM management - Stakeholder engagement reporting

1.13 Structure of the Entire Report

The structure of this ESIA follows the prescribed requirements of the African Development Bank (AfDB) for Category 1 projects and the Federal Ministry of Environment (FMEnv) for Category I undertakings. Given the scale, sensitivity, and multi-site nature of the LSHIP, strict adherence to these frameworks is essential to ensure regulatory compliance, methodological rigour, and alignment with international best practice.

Chapter 1 has established the strategic foundation for the assessment by presenting the national context, project rationale, delivery arrangements, and safeguard triggers. It has also outlined the legal and policy framework, introduced the project's risk categorisation, described the statewide cluster and typology structure, and defined the institutional leadership and communication systems required for environmental and social management. Together, these elements set the stage for a comprehensive Category 1 ESIA.

The subsequent chapters build on this foundation by presenting baseline conditions, assessing potential impacts, proposing mitigation measures, and detailing the environmental and social management instruments required for implementation. The ESIA is organised into ten chapters and twenty-eight appendices, structured to fully meet the expectations of FMEnv, Lagos State regulators, and AfDB.

Report Structure

- Chapter 1 – Introduction National context, project overview, legal and policy framework, risk categorisation, resettlement triggers, climate considerations, gender and vulnerability, institutional arrangements.
- Chapter 2 – Project Justification & Alternatives Rationale for the project, need assessment, alternative analysis (site, technology, design, "no-project" option).
- Chapter 3 – Project & Process Description Detailed description of all 29 PHC sites, design specifications, construction processes, operational systems, resource requirements.
- Chapter 4 – Baseline Environment Physical, biological, socio-economic, cultural, and climate baseline conditions across the project footprint.
- Chapter 5 – Impact Assessment Identification and evaluation of unmitigated environmental and social impacts for construction and operation phases.
- Chapter 6 – Mitigation Measures Proposed measures to avoid, minimise, reduce, or compensate for identified impacts.
- Chapter 7 – Environmental & Social Management Plan (ESMP) Roles, responsibilities, monitoring framework, performance indicators, capacity-building requirements, and budget.
- Chapter 8 – Hazardous & Medical Waste Management Plan (HMWMP) Procedures for segregation, storage, treatment, transportation, and disposal of medical and hazardous waste.
- Chapter 9 – Stakeholder Engagement & GBV/SEA/SH Action Plan Engagement strategy, grievance redress mechanism, gender-based violence prevention measures, and community interface protocols.
- Chapter 10 – Conclusion & Recommendations: Summary of findings, safeguard commitments, and recommendations for implementation.

1.14 FMEnv Participation, ESIA Team Composition and Stakeholders Engagement

1.14.1 FMEnv Participation and Documentation

The Federal Ministry of Environment (FMEnv) formally participated in the ESIA process for the Project and issued two statutory notifications to the Lagos State Ministry of Health (LSMoH):

1. Participation in Data Gathering and Laboratory Analyses (Letter Ref: FMEnv/EA/EIA/9513/VOL1/26)

FMEnv notified the LSMoH of its intention to witness the field data-gathering and laboratory sampling exercises. FMEnv officials were present during the sampling activities, and a Field Attestation Register was produced and signed by FMEnv representatives, the project proponent, and the ESIA consultants. The signed register is included as Appendix 10.

2. Participation in the Scoping Workshop (Letter Ref: FMEnv/EA/EIA/9513/VOL1/27)

FMEnv confirmed its participation in the Scoping Workshop alongside other state-level stakeholders. The workshop was successfully conducted and established the scope, data requirements, and key environmental and social issues to be addressed in the ESIA. The proceedings are documented in the relevant section of this report.

The two FMEnv notification letters (Refs: VOL1/26 and VOL1/27) constitute the official FMEnv documentation for this project and are included in Appendix 1.3. No additional confirmation letter is required, as the signed Field Attestation Register already provides formal evidence of FMEnv's statutory participation in the ESIA process.

FMEnv Participation and AfDB Operational Safeguards

Commented [SA27]: What about OS 4, OS6, & OS8?

Commented [Ma28R27]: Addressed- OS4, OS6 and OS8 included

FMEnv's statutory involvement directly supports compliance with the AfDB Integrated Safeguards System (ISS, 2023/2024) by strengthening:

- OS1 – Environmental and Social Assessment: through validation of the accuracy, credibility, and completeness of baseline environmental and social data.
- OS2 – Labour and Working Conditions: by ensuring that field sampling and laboratory activities adhere to national occupational health and safety requirements.
- OS3 – Resource Efficiency and Pollution Prevention: via oversight of air, water, soil, and noise sampling that informs pollution prevention and environmental quality management.
- OS4 – Community Health, Safety and Security: FMEnv's review and oversight validate community health and safety risk assessments—specifically addressing the unique vulnerabilities of riverine and island communities during waterborne equipment mobilization, motorized barge/canoe transport logistics, and the rigorous prevention and response framework for Gender-Based Violence and Sexual Exploitation, Abuse, and Harassment (GBV/SEA/SH) linked to labour influx.
- OS5 – Land Acquisition, Restrictions on Land Use and Involuntary Resettlement: by confirming site conditions and community interactions relevant to land access and potential displacement risks.

- OS6 – Biodiversity and Ecosystem Services: FMEnv validates the ecological baselines and impact evaluations concerning the mangrove and riparian ecosystems at Gberefu and Agboyi, both classified as Likely Critical Habitat (Rhizophora\ racemosa). Statutory oversight ensures that construction methods, buffer zones, and the "Barge-to-Truck" waste-transfer protocol strictly prevent discharges into sensitive aquatic habitats, aligning with the "no net loss" mandate.
- OS8 – Cultural Heritage: FMEnv's regulatory review incorporates the assessment and mandatory protection of irreplaceable cultural assets within the axis, specifically safeguarding the historic Point of No Return heritage site and the Spirit Attenuation Well at Gberefu Island. Statutory compliance enforces strict Chance Finds Procedures and local institutional engagement during any earthworks or site upgrades.
- OS10 – Stakeholder Engagement and Information Disclosure: by participating as a statutory stakeholder and reinforcing transparency, regulatory oversight, and proper documentation of engagement processes.

FMEnv Witnessing and Baseline Data Integrity

FMEnv's witnessing of the field data-gathering and laboratory sampling exercises ensures the integrity, reliability, and traceability of all baseline environmental and social data used in this ESIA. The signed Field Attestation Register provides independent verification that sampling methods, equipment use, chain-of-custody procedures, and laboratory analyses complied with national regulatory standards. This independent validation is essential for producing quantified, site-specific impact assessments, a core requirement under AfDB OS1 and a key concern highlighted during the Bank's review.

1.14.2 Stakeholder Engagement

FMEnv's participation in the field data-gathering and scoping processes forms part of the Project's regulatory stakeholder engagement and aligns with AfDB OS10 requirements for free, fair, prior, and informed consultation. The witnessing exercise was conducted with the attendance of the following FMEnv and State officials:

4. Okwesa Francesca – FMEnv, Abuja
5. Oshimowo T. Bolaji – Ministry of Environment & Water Resources, Lagos State
6. Adenaike Olubunmi O. – FMEnv, Lagos Zonal Office
7. Oyawoye Anuoluwa – LSMOE/WR

8. Mr. Braimoh – PHCB
9. Shittaboy Tolulope – FMEnv, Lagos Zonal Office
10. Kehinde Biok T. – FMEnv, Lagos Zonal Office
11. Eberechukwu E.U – FMEnv, Lagos Zonal Office

Their presence ensured transparency, regulatory oversight, and proper documentation of engagement activities. This statutory participation is cross-referenced in the Stakeholder Engagement Plan (SEP), where broader community consultations, attendance records, and engagement outcomes are detailed. FMEnv's witnessing also provides assurance that stakeholder interactions were conducted in a manner consistent with OS10 principles of inclusiveness, fairness, and informed participation. **plplPlppllgg pl p** Plate 1.1 shows a collage of pictures of the Regulators and some stakeholders met.



Stakeholders at the Meetings Held for the Badagry Axis



Stakeholders with the FMENv Rep During the Stakeholders Meeting



The Federal Controller, FMENv, Lagos



Scoping Workshop with Stakeholders Before the Field Work





MDS ESIA Leads with FMENv Reps

Plate 1.1: Collage of Photographs Showing Engagement with Regulators and Stakeholders During the ESIA Exercises

1.15 Public Disclosure and Accessibility

In accordance with AfDB's Policy on Disclosure and Access to Information (DAI Policy), which requires timely disclosure of project information to enable genuine public participation, the following accessibility measures will be implemented during the 120-day public disclosure period:

1.15.1 Accessibility for Illiterate Community Members

- Audio Recordings: Audio recordings of the Non-Technical Summary will be produced in English and Yoruba and made available at PHC waiting areas, community halls, and through community liaison officers.
- Community Radio: Key findings will be broadcast on local radio stations in Yoruba, Egun, and English over three consecutive weeks, given the remote coastal and riverine nature of the Badagry communities.
- Public Readings: Public readings of the Non-Technical Summary will be conducted at each PHC site and community hall, with facilitators available to answer questions.

1.15.2 Accessibility for Visually Impaired Persons

- Large-Print Versions: Large-print (18pt font) versions of the Non-Technical Summary will be available at all disclosure locations.
- Audio Descriptions: Audio recordings will include verbal descriptions of key figures and maps.
- Assistance: Community liaison officers will be available to assist visually impaired persons in reviewing the report.

1.15.3 Accessibility for Remote and Coastal Communities

- Local Disclosure Points: In addition to LSMoH headquarters and Badagry West LCDA secretariat, hard copies of the ESIA and Non-Technical Summary will be available at:
    - Gberefu PHC waiting area
    - Ibereko PHC waiting area
    - Agboyi PHC waiting area
    - Badagry West LCDA Secretariat
    - Community halls in each catchment
    - Fish landing areas - Gberefu
- Boat Transport: For Gberefu, which have limited road access and are coastal/riverine communities, copies will be transported by boat to the communities and made available at the PHCs and landing areas.

1.15.4 Feedback Mechanism During Disclosure

During the 120-day disclosure period, public comments on the draft ESIA will be collected through:

Channel	Description
GRM Hotline	Toll-free number for verbal comments
Suggestion Boxes	Located at each PHC, community hall, and market
Community Meetings	Dedicated feedback sessions at each site
Written Submissions	Email and physical address provided in ESIA

All comments will be logged, reviewed, and responded to within 14 days. A summary of comments received and project responses will be included in the final ESIA.

1.15.5 Language and Translation

The Non-Technical Summary will be provided in:

- English (official language)
- Yoruba (dominant local language)
- Pidgin English (widely spoken in coastal communities)
- Ilaje/Egun (indigenous language of coastal fishing communities)

CHAPTER 2 – PROJECT JUSTIFICATION & ALTERNATIVES

2.1 Introduction

This chapter presents the justification for the Lagos State Health Infrastructure Project (LSHIP) as it pertains to the Badagry Axis – Group 8. It demonstrates why the project is necessary for the riverine and island communities of Ibereko, Gberefu, and Agboyi, what benefits it will deliver, and how it aligns with national, state, and international development priorities. The chapter also presents a systematic alternatives analysis, comparing the preferred revitalization option against reasonable alternatives including the no-project option, alternative sites, engineering designs, and construction methods tailored for high-salinity and flood-prone terrains.

The alternatives analysis follows:

- **FMEnv EIA Act CAP E12 LFN 2004** (Section 4 – consideration of alternatives) (Federal Ministry of Environment, 2004)
- **AfDB Operational Safeguard 1 (OS1)** – alternatives analysis including no-action, technological, site, design, and operational alternatives (African Development Bank, 2013) [Retained under AfDB ISS 2023 OS1 (Assessment and Management of E&S Risks and Impacts).]
- **IFC Performance Standard 1** – consideration of technically and financially feasible alternatives (International Finance Corporation, 2012)
- **Equator Principles IV** – assessment of alternatives including environmental and social impacts (Equator Principles Association, 2020)

Note on Report Structure: This ESIA report covers only Badagry Axis – Group 8. The justification and benefits presented in this chapter apply to the entire LSHIP programme, while the alternatives analysis focuses on site-specific considerations for the Ibereko, Gberefu, and Agboyi facilities covered in this report.

2.2 Project Justification

2.2.1 Deficiencies of Existing Healthcare Infrastructure (Badagry Axis – Group 8)

Based on the site observation logs and baseline studies conducted for the Lagos State Health Infrastructure Project (LSHIP), the existing infrastructure at Ibereko, Gberefu, and Agboyi PHCs currently suffers from critical deficiencies that hinder healthcare delivery in the western coastal and Kosofe riverine corridors.

The deficiencies are categorized below across structural, clinical, and operational domains:

1. Structural & Environmental Deficiencies

Being located within the coastal Badagry corridor, these facilities face unique environmental stressors that have degraded the physical assets:

- Rising Damp & Saltwater Intrusion: Ibereko and Gberefu PHCs show advanced "rising damp" in wall carcasses due to shallow water tables (1–2 meters). This causes structural weakening, paint peeling, and unhygienic clinical environments.
- **Physical Abandonment & Decay:** Gberefu PHC has been largely non-functional, with the structure being "taken over by bats, reptiles, and thickets." Ibereko PHC is currently distressed with noticeable cracks along the walls.
- Roofing Failures: Extensive leakages during the rainy season due to aged, corroded aluminum or asbestos roofing sheets. This has previously led to the damage of medical records and sensitive equipment making wards unusable during the rainy season.
- Inadequate Perimeter Security: Poorly defined or dilapidated fencing, leaving the facilities (especially Agboyi PHC) vulnerable to theft of medical supplies and compromising the safety of staff on night shifts.

2. Utilities & WASH (Water, Sanitation, and Hygiene)

The lack of basic utilities is a primary barrier to standard medical practice in this axis:

- Unreliable Power Supply: High dependency on expensive diesel generators or failing national grid connections. At Gberefu, the only standing equipment is a rusty, non-functional generator, which prevents the "cold chain" storage required for vaccines.
- **Water Scarcity & Contamination:** Agboyi and Gberefu lack public drainage and reliable waste disposal; residents often rely on the river as both a water source and a site of waste. Existing boreholes are frequently contaminated with high E. coli levels due to the proximity of makeshift wooden latrines.
- Substandard Waste Management: Lack of modern medical waste segments. Most sites currently use makeshift pits for sharps and infectious waste, posing a significant biohazard risk to the surrounding community.

3. Clinical & Space Deficiencies

The original layouts of these PHCs were not designed for modern patient volumes or specialized maternal care:

- Congested Outpatient Departments (OPD): Agboyi PHC serves a combined population of nearly one million people across three enclaves (Agboyi I, II, and III) who rely on wooden canoes for access. This far exceeds the standard 1:10,000 PHC capacity, leading to extreme overcrowding.
- **Lack of 24/7 Emergency Capacity:** Gberefu residents face preventable maternal and infant deaths because the health centre lacks the infrastructure to support a doctor's coverage or 24-hour shifts.
- Lack of Privacy: Consultation rooms often lack soundproofing or physical partitions, compromising patient confidentiality during examinations.
- Inadequate Staff Quarters: the lack of modern on-site housing has historically led to a shortage of personnel during late-night emergencies, as staff cannot safely reside within the facility.
- Manual Records Management & Referral Isolation: A complete absence of digital infrastructure, leading to slow patient processing and high rates of data loss or clerical errors in maternal health tracking. In Agboyi, the lack of motorable roads means emergency cases must wait for canoes, creating critical delays in reaching secondary hospitals.

4. Summary Table of Site-Specific Deficiencies

Table 2.1: Site-Specific Deficiencies

Facility	Primary Infrastructure Deficiency	Clinical Impact
Ibereko PHC	Distressed structure; wall cracks; rising damp.	Foundation failure risks; unsterile consultation rooms.
Gberefu PHC	Dilapidation; taken over by bats/thickets.	Total loss of 24/7 emergency capacity for 16,000 residents.
Agboyi PHC	Extreme fluvial flooding (up to 5m); no motorable road access.	Seasonal isolation; waterborne illness epidemics.

Strategic Alignment: These deficiencies are the direct targets of the Refurbishment plans. The proposed solar-hybrid power, automated water systems, and climate-smart designs are intended to permanently resolve these legacy issues.

2.2.2 Safety Issues (Badagry Axis – Group 8)

The safety issues for the Group 8 facilities are framed by two distinct phases: the current operational hazards (baseline) and the occupational risks associated with the refurbishment under the LSHIP project.

1. Facility-Specific Safety Risks (Current Baseline)

Before the full scale of interventions, the following safety concerns were identified during site reconnaissance:

- **Biological & Hygiene Hazards:** The presence of mold, bats, and reptiles at Gberefu PHC creates respiratory and zoonotic risks for staff.
- **Drowning & Waterborne Disease:** Residents of Agboyi navigate to the PHC via canoes through floodwaters reaching 5 meters deep, facing high risks of boat mishaps and contact with toxic water containing high E. coli levels.
- **Structural Instability:** Ibereko's noticeable cracks pose a risk of localized structural failure if left unaddressed.
- Fire Safety: Across all three sites, there is a noted absence of functional fire extinguishers, clear emergency exit signage, and fire alarm systems.

2. Occupational Health & Safety (OHS) during Construction

With the three PHCs being refurbished, the Environmental and Social Impact Assessment (ESIA) highlights several project-related safety issues:

- **Waterborne Logistics Hazards:** The mobilization of motorized barges for material transport to Gberefu and Agboyi islands carries risks of aquatic accidents and fuel spills into fishing grounds.
- **Asbestos Exposure:** Controlled removal of old roofing sheets at Ibereko and Gberefu requires specialized PPE (P3 respirators, Type 5 coveralls) to prevent inhalation of carcinogenic fibers.
- **Flood-Related Work Risks:** Construction at Agboyi must account for sudden fluvial
- Sharps & Waste Safety: During the "Total Revitalization," the removal of old plumbing and medical waste pits may expose workers to biohazardous materials or needle-stick injuries if legacy waste was not properly managed.

3. Community & Public Safety Concerns

The ESIA also identifies safety issues that extend beyond the facility walls into the local Badagry communities:

- **Traffic & Pedestrian Safety:** While Agboyi has no motorable roads, the narrow community paths are used by nearly a million residents; construction material porterage must be strictly managed to avoid accidents.
- **Social & Gender-Based Violence (GBV):** The influx of construction labor (85–105 workers) into isolated island communities increases the risk of SEA/SH if not managed via a Worker Code of Conduct.
- Environ.;p[mental Safety: Improper disposal of construction debris (e.g., old asbestos roofing sheets from the 3 PHCs) could lead to long-term soil and water contamination in these coastal areas.

4. Mitigation Summary (ESIA Requirements)

To address these issues, the project mandate requires:

Safety Issue	**Mitigation Measure**
Construction Accidents	Mandatory Use of PPE (Boots, Helmets, High-vis) and a "Safety Officer" on site.
Electrical Safety	Installation of earthing systems and circuit breakers in the new solar-hybrid setups.
Waste Hazards	Implementation of a Medical Waste Management Plan including color-coded bins and lined pits.
Waterborne Accidents	Mandatory use of life jackets; NIWA-certified boat operators; spill kits on all barges.
Asbestos Release	Licensed abatement contractor; "wet removal" method; double-bagging of waste.
Island Access Gaps	Implementation of solar-powered site lighting and reinforced perimeter fencing.
Disease Outbreaks	Implementation of a "Barge-to-Truck" medical waste manifest to protect river water.

2.2.3 Congestion

Within the context of the Badagry Axis - Group 8, "Congestion" refers to the critical bottlenecking of patients and logistics that currently hinders healthcare delivery. These facilities are often "overserved" relative to their design capacity, leading to the following specific congestion issues:

1. Clinical & Patient Congestion

- Overburdened Outpatient Departments (OPD): Baseline assessments for the LSHIP project show that these facilities often serve populations exceeding 20,000 to 30,000 persons, far beyond the standard 1:10,000 recommendation for PHCs. This results in overcrowded waiting areas where patients wait for hours, increasing the risk of airborne cross-infection.
- Bed Shortages: In facilities like Farasime, the limited number of observation beds means that during peak periods (e.g., malaria outbreaks or multiple deliveries), patients may have to be treated in suboptimal, non-private spaces.
- Wait-Time Backlogs: Due to the manual nature of records and pharmacy management, significant "administrative congestion" occurs, with patients spending up to 2–4 hours just to navigate from registration to consultation.
- **Spatial Clutter:** Existing PHCs lack dedicated Maternal and Child Health (MCH) wings, causing emergency deliveries, immunizations, and general outpatient cases to intermingle in narrow hallways.

2. Space & Layout Congestion

- Intermingled Clinical Flows: Current structures often lack dedicated corridors for different types of care. Congestion arises when maternal care, immunization, and emergency trauma cases share the same narrow hallways and entrance points.
- Storage Inefficiency: Medical supplies, equipment, and records are often stored in clinical rooms due to a lack of dedicated storage units, creating a "cluttered" environment that restricts medical personnel movement.

3. Logistics & Access Congestion

- Site Access Bottlenecks: The lack of motorable roads in Agboyi and the lagoon crossing at Gberefu mean that logistical congestion (waiting for available canoes or barges) directly delays emergency medical evacuations.
- External Road Congestion: The Badagry-Expressway corridor often experiences massive traffic delays. This "macro-congestion" impacts the facilities by delaying the delivery of

essential medical supplies (like oxygen or vaccines) and complicating the referral of critical cases to the Badagry General Hospital.

4. Mitigation through the LSHIP Project

The ongoing interventions are designed to "de-congest" these PHCs through:

- Spatial Expansion: Increasing the footprint of consultation and ward areas to improve patient flow.
- Digital Transformation (HMIS): Reducing administrative congestion by shifting to digital records, which speeds up patient intake and processing.
- Separated Clinical Wings: Establishing dedicated Maternal and Child Health (MCH) wings to ensure that sensitive cases are handled in spaces separate from general outpatient traffic.

2.3 Strategic Need

The LSHIP aligns with Lagos State's two-pronged health strategy: (1) ensuring all residents have access to quality healthcare without financial ruin, and (2) making Lagos State a premier destination for inbound medical tourism. The project supports the State's THEMES+ agenda and contributes to the achievement of Universal Health Coverage.

2.3.1 Lagos State Development Plan 2052 – Health Sector Goals

The Lagos State Development Plan 2052 sets ambitious health sector targets (Lagos State Government, 2022):

- Achieve Universal Health Coverage (UHC) by 2030
- Reduce maternal mortality from 150 to below 70 per 100,000 live births
- Reduce under-five mortality from 45 to below 25 per 1,000 live births
- Strengthen pandemic preparedness and response

LSHIP directly contributes by expanding access to primary care, improving quality (refurbished PHCs), and strengthening referral systems.

2.3.2 AfDB High 5 Priorities

The LSHIP aligns with four of AfDB's five High 5 priorities (African Development Bank, 2015):

1. **"Improve the Quality of Life for the People of Africa"** – improved healthcare access, job creation
2. **"Light Up and Power Africa"** – solar PV systems at all PHCs
3. **"Feed Africa"** – indirectly through improved health of farmers
4. **"Industrialize Africa"** – healthier workforce, reduced absenteeism

2.3.3 Sustainable Development Goals (SDGs)

The LSHIP directly contributes to SDG 3 (Health), SDG 5 (Gender), SDG 8 (Decent Work), SDG 9 (Infrastructure), SDG 10 (Reduced Inequalities), SDG 11 (Sustainable Cities), SDG 12 (Responsible Consumption), SDG 13 (Climate Action), SDG 16 (Peace, Justice), and SDG 17 (Partnerships) (United Nations, 2015).

2.4 Project Benefits

The LSHIP is projected to deliver significant socio-economic impacts as part of Lagos State's broader health system transformation strategy:

- Over 6,500 direct jobs to be created across all components
- 1 million additional patient visits to PHCs and General Hospitals annually
- 1,240 additional patient beds
- 2,500 new health workers trained annually (upon completion of the University of Medical and Health Sciences)
- 6.4 million lab tests and 480,000 imaging scans to be supported annually through the MDSPS
- Annual economic impact: N138.6 billion (US$92 million)

Collectively, these investments will improve the lives and livelihoods of millions of Lagos residents while making Lagos a premier destination for medical tourism.

2.4.1 Economic Benefits (LSHIP Programme)

Table 2.2: Economic Benefits

Benefit	Quantification	Source
Direct jobs created	6,537 direct jobs across all components	Lagos State Ministry of Health, 2025, p. 44
Indirect jobs	Estimated 10,000–15,000	Consultant estimate
Annual economic impact	N138.6 billion (US$92 million)	Lagos State Ministry of Health, 2025, p. 44
Local procurement	60–70% of construction budget	Multiple Development Services, 2026

2.4.2 Social Benefits (Badagry Axis Focus)

The social benefits for the Badagry Axis - Group 8 (Iberefu, Gberefu and Agboyi) are centered on the core objectives of the LSHIP/IMPACT Project. These benefits are designed to move the needle on community wellness, economic stability, and social equity in these coastal regions.

The table below outlines these benefits categorized by their impact, estimated quantification (based on project standards), and the technical source.

Table 2.3: Social Benefits Matrix: Group 8

Benefit	Quantification (Projected/Target)	Source
Reduction in Maternal & Child Mortality	15–20% decrease in under-5 mortality and maternal complications within the first 24 months of full operation.	World Bank IMPACT Project (Results Area 1: Utilization of MCH services).
Increased Healthcare Accessibility	Expansion of 24/7 service availability to 16,000+ residents in Gberefu and nearly 1 million in Agboyi corridor	LSHIP Inception Report (Site baseline capacity vs. design population).
Universal Health Inclusion (PWDs)	100% barrier-free access achieved through the installation of ramps and universal-access clinical suites.	ESIA (Social Safeguards): Compliance with Lagos State Special People's Law.
Digital Equity & Transparency	Transition from 0% to 100% digital data capture for all maternal and immunization cases.	LASG DHIS2 Digitization Initiative (Health Management Information System).
Local Job Creation	Employment of 50–100 local laborers and vendors during refurbishment; long-term employment for facility management staff.	LASIAMA (Facility Management Outsourcing) & Project Labor Management Plan.
Financial Risk Protection	Reduction of out-of-pocket expenditure for families by 30% through integrated referral links to the ILERA EKO health insurance scheme.	Lagos State Health Management Agency (LASHMA) Social Protection Policy.

Community Health Resilience	Provision of standardized WASH facilities and solar-powered vaccine cold-chains, ensuring 95% immunization coverage for infants via solar inverter systems..	LSHIP Environmental & Social Management Plan (ESMP).

2.4.3 Environmental Benefits (LSHIP Programme)

Table 2.4: Environmental Benefits

Benefit	Quantification	Source
Solar PV capacity	1.55–3.1 MW total across all facilities	Consultant estimate
GHG emissions reduction	2,000–4,000 tCO2e/year	Consultant estimate
Diesel savings	500,000–1,000,000 litres/year	Consultant estimate
Water conservation	Rainwater harvesting (5,000–10,000 L storage per PHC)	Consultant estimate

2.5 Alternatives Analysis

2.5.1 No-Project Alternative

Description: The LSHIP is not implemented. Lagos State continues with existing healthcare infrastructure.

Environmental Impacts (No-Project):

- Continued improper medical waste management
- Continued reliance on diesel generators (air pollution, GHG emissions)
- No climate-resilient infrastructure – existing facilities remain vulnerable to flooding, erosion, heatwaves
- Vulnerability to permanent facility submergence from a projected 0.5–0.8m sea-level rise by 2100.

Social Impacts (No-Project):

- Continued preventable deaths in Gberefu due to abandonment.
- Continued maternal and child mortality (no improvement)
- Continued out-of-pocket expenditure (>80%)
- No RAPs for displaced persons – squatters remain at risk of eviction without compensation

- Continued asbestos exposure risk (Ibereko)

Economic Impacts (No-Project):

- No direct job creation (6,537 jobs foregone)
- Continued productivity losses from morbidity

Conclusion: The no-project alternative is unacceptable. It perpetuates health inequities, fails to address infrastructure deficits, and ignores environmental and social risks.

2.5.2 Alignment Alternatives (Site Selection –Group 8)

The site selection process was governed by the need to maximize community reach while minimizing environmental and social displacement. Under the LSHIP/IMPACT Project framework, "Alternative Sites" were assessed primarily to determine if a new location would be more viable than the existing footprint (Brownfield vs. Greenfield).

The following table outlines the alignment alternatives considered during the feasibility and ESIA phase:

Table 2.5: Site Selection & Alignment Alternatives: Badagry Group 8

Facility	Preferred Site	Alternative Site(s) Assessed	Reason for Rejection
Ibereko PHC	Existing Footprint (Refurbishment)	Alt A: Relocation to a new plot along the Seme Border road.	Social Connectivity: The existing site is a known landmark. Relocation would disrupt immunization attendance patterns.
Gberefu PHC	Existing Location (Total Revitalization)	Alt B: Relocation to the Badagry Marina mainland.	Heritage & Inequity: Would cut off healthcare for the 16,000 residents on the island. Also risks encroaching on historical slave route assets.
Agboyi PHC	Existing Footprint (Resilient Expansion)	Alt C: Relocation to upland Ketu.	Spatial Inequity: Residents rely on wooden canoes. An inland site would make emergency obstetric care prohibitively expensive/slow.

Technical Selection Criteria (Summary of Rationale)

The selection of the Original/Preferred Sites across Group 8 was finalized based on four key "Alignment Drivers":

1. Land Ownership & Encumbrance: The preferred sites are already owned by the Lagos State Government or have clear, undisputed community titles. Alternative sites often presented a risk of protracted land-title disputes or required complex Resettlement Action Plans (RAP).
2. Social Connectivity: The existing sites are "Social Landmarks." Residents are already accustomed to seeking care at these coordinates. Relocation would have caused a temporary drop in immunization and antenatal care (ANC) attendance.
3. Environmental Safeguards: In the Badagry axis, soil stability and flood levels vary significantly. The preferred sites were chosen because they sat on relatively higher ground (comparative to the low-lying coastal alternatives) and had better natural drainage potential.
4. Cost-Effectiveness: Utilizing existing footprints (Brownfield) for Ibereko and Gberefu reduces the carbon footprint of the project by reusing existing shells.

Conclusion: The preferred sites are optimal based on proximity to target populations, land availability (government-owned or voluntarily donated), accessibility, and cost.

2.5.3 Engineering Alternatives (Building Design)

Table 2.6: Engineering Alternatives

Alternative	Description	Advantages	Disadvantages	Selected?
Conventional design	Standard concrete block, grid electricity, diesel backup, conventional HVAC	Lower upfront cost (estimated 20% less)	Higher operating costs; higher GHG emissions; no climate resilience	No
Green building design (preferred)	Solar PV, natural ventilation, cool roofs, rainwater harvesting, energy-efficient lighting, disability-friendly design	Lower operating costs (40–60% reduction in energy costs); lower GHG emissions; climate-resilient; aligns with SDGs and NDCs	Higher upfront cost (estimated 20% premium)	**Yes**

Justification for green building design: Long-term cost savings, climate resilience, environmental benefits, social benefits (improved patient/staff comfort, disability access), alignment with AfDB, IFC, and Lagos State green building policies.

2.5.4 Energy Supply Alternatives

Table 2.7: Energy Supply Alternatives

Alternative	Description	Advantages	Disadvantages	Selected?
Grid only	Rely solely on national grid	No upfront cost	Grid unreliable; no power during outages; no climate resilience	No
Diesel generator only	Diesel generators as primary power	Reliable (if fuel available)	High operating cost; air pollution; noise; GHG emissions	No
Grid + generator	Grid primary, generator backup	Moderate upfront cost	Still relies on grid (unreliable) and generator (pollution, cost)	No
Solar PV + battery + grid (preferred)	Solar primary, battery storage, grid backup	Low operating cost; zero emissions (during solar operation); silent; climate-resilient; 24–48 hour battery backup	Higher upfront cost (but declining)	**Yes**

2.5.5 Water Supply Alternatives

Table 2.8: Water Supply Alternatives

Alternative	Description	Advantages	Disadvantages	Selected?
Borehole only	Single borehole	Low upfront cost	Risk of depletion; no backup; no water quality treatment	No
Borehole + treatment	Borehole with UV filtration	Improved water quality	Still single point of failure; no backup	No

			during borehole failure	
Borehole + rainwater harvesting + treatment (preferred)	Borehole primary, rainwater backup, UV filtration	Water security (rainwater backup); reduced groundwater abstraction; improved quality	Higher upfront cost (rainwater storage tanks)	**Yes**

2.5.6 Wastewater Treatment Alternatives

Table 2.9: Wastewater Treatment Alternatives

Alternative	Description	Advantages	Disadvantages	Selected?
Septic tank + soakaway (PHCs)	Standard for low-flow facilities	Low cost; low maintenance	Not suitable for high volumes; risk of groundwater contamination if poorly maintained	Yes
No treatment (discharge to drain)	Direct discharge to storm drain	Zero cost	Illegal (violates NESREA); environmental contamination; public health risk	No

2.5.7 Climate Alternatives

Table 2.10: Climate Alternatives

Alternative	Description	Advantages	Disadvantages	Selected?
Standard design (no climate adaptation)	Design for current climate (1:50-year storm, no sea-level rise, no heatwave planning)	Lower upfront cost	Vulnerable to climate hazards; shorter facility lifespan; higher future adaptation cost	No
Climate-resilient design (preferred)	Design for future climate (1:100-year storm + 30% factor, elevated electricals,	Resilient to climate hazards; longer lifespan; lower future adaptation	Higher upfront cost (estimated 10–15% premium)	Yes

	cool roofs, solar PV)	cost; aligns with NDCs		

Justification for climate-resilient design: Lagos is highly vulnerable to climate hazards (flooding, heatwaves). Facilities designed for 50+ year lifespan will face significantly different climate conditions by 2050–2070 (Intergovernmental Panel on Climate Change, 2021).

2.5.8 Waste Management Alternatives

Table 2.11: Waste Management Alternatives

Alternative	Description	Advantages	Disadvantages	Selected?
Open burning (current practice at some PHCs)	Burn waste on site	Zero cost (illegal)	Air pollution (dioxins, furans, PM); community health risk; illegal under NESREA	No (prohibited)
Unsegregated disposal to landfill	Mixed waste (including infectious) sent to landfill	Simple	Environmental contamination; public health risk; violates healthcare waste standards	No
WHO-compliant HMWMP (preferred)	Segregation (colour-coded), safe storage, treatment (autoclave), LAWMA disposal	Protects workers, communities, environment; complies with WHO, AfDB, NESREA	Requires training, equipment, ongoing cost	**Yes**

Justification for WHO-compliant HMWMP: Mandatory under AfDB OS4 [AfDB ISS 2023: OS4 is Community Health, Safety and Security; pollution prevention is OS3.], IFC PS3, and NESREA regulations (World Health Organization, 2014).

2.5.9 Construction Alternatives

Table 2.12: Construction Alternatives – Badagry Axis (Group 8)

Alternative	Description	Advantages	Disadvantages	Selected?

Traditional construction	Conventional materials and methods (cement, steel, block)	Familiar; locally available; lower cost	Higher embodied carbon; slower construction	**Yes** (with low-carbon measures)
Low-carbon construction	Use of low-carbon cement, recycled steel, local materials, reduced waste	Lower embodied carbon (20–30% reduction)	Slightly higher cost; requires sourcing	**Yes** (where feasible)

Construction Measures – Badagry Axis (Group 8):

Site	Local Sourcing	Waste Minimization	Low-Carbon Measures
Ibereko PHC	✓ (preferred)	✓ (reuse, recycle)	✓ (PLC cement)
Gberefu PHC	✓ (preferred)	✓ (reuse, recycle)	✓ (PLC cement)
Agboyi PHC ✓	(preferred) ✓	(reuse, recycle) ✓	(PLC cement)

2.6 Climate Alignment

2.6.1 Nigeria's NDC Alignment

Nigeria's updated NDC (2021) commits to (Federal Ministry of Environment, 2021):

- **Adaptation:** Climate-resilient infrastructure, flood management, heatwave preparedness
- **Mitigation:** 20% unconditional (47% conditional) GHG reduction by 2030

LSHIP aligns through oversized drains (+30% climate factor), elevated electricals, solar PV (2,000–4,000 tCO2e/year reduction), and energy-efficient design.

2.6.2 TCFD Alignment

The LSHIP follows TCFD recommendations (Task Force on Climate-related Financial Disclosures, 2017):

Table 2.13: TCFD Alignment

TCFD Pillar	LSHIP Action
Governance	PIU responsible for climate risk management; ESMP includes climate monitoring
Strategy	Climate-resilient design protects assets and operations
Risk Management	Climate hazard mapping; risk assessment; adaptation measures

Metrics and Targets	GHG inventory; emissions reduction target (net-zero operational carbon)

2.7 Gender & Inclusion Alignment

The LSHIP mainstreams gender across all components (Lagos State Ministry of Women Affairs and Poverty Alleviation, 2023):

- **Facility design:** Separate maternal and child health spaces; female staff facilities; disability-friendly access
- **GBV prevention and response:** GBV Action Plan (Chapter 9); Code of Conduct; confidential reporting; referral pathways
- **Employment:** Gender-balanced hiring (≥50% female clinical staff, ≥30% female administrative staff)
- **Stakeholder engagement:** Gender-segregated FGDs; female GRM focal points; women's groups consulted
- **Livelihood restoration (RAPs):** Women-headed households receive vulnerability support; women's skills training and business grants

2.8 Circularity & Resource Efficiency

2.8.1 Material Reuse and Recycling

Table 2.14: Material Reuse and Recycling

Material	Source	Reuse/Recycling Potential
Refurbishment waste (concrete, blocks, steel)	Demolition of existing structures	Crushed concrete and blocks reused as fill; steel recycled
Asbestos	Ibereko, Gberefu and Agboyi (suspected)	No reuse – hazardous waste; disposed at licensed landfill
Excavated soil	Earthworks (foundations, drainage)	Reused as fill on site; excess for landscaping

2.8.2 Resource Efficiency

Table 2.15: Resource Efficiency

Resource	Efficiency Measure	Estimated Savings
Energy	Solar PV; LED lighting; natural ventilation	40–60% reduction in grid/diesel consumption

Water	Rainwater harvesting (5,000–10,000 L storage); water-efficient fixtures	20–30% reduction in borehole abstraction

2.9 Local Content and Economic Development Plan

The LSHIP is committed to maximising local economic benefits through a comprehensive Local Content and Economic Development Plan. This plan aims to:

1. **Maximise local procurement** of goods and services
2. **Create sustainable employment** for local communities
3. **Build local capacity** through skills transfer and training
4. **Support local businesses** through inclusive procurement processes
5. **Ensure equitable benefits** for women and vulnerable groups

2.9.1 Local Content Framework

Table 2.16: Local Content Framework – Badagry Axis (Group 8)

Component	Target	Implementation Strategy	Monitoring
Local Procurement	≥50% of eligible materials and services	- Supplier registration database - Preference for local suppliers - Transparent procurement	Procurement records; supplier registration
Local Hiring	≥50% unskilled; ≥30% skilled	- Local job advertisements - Community notification - Hiring from within LGA	Hiring records (by LGA of residence)
Local Subcontracting	≥40% of eligible subcontracts	- Local contractor registration - Capacity building - Tiered subcontracting	Subcontract records

Women-Owned Businesses	≥20% of local procurement	- Women entrepreneur support - Gender-responsive procurement - Business training	Procurement records by gender
Skills Transfer	≥100 local workers trained	- Apprenticeship programs - On-the-job training - Vocational training partnerships	Training completion records
Community Investment	≥1% of construction budget	- Community development projects - Infrastructure improvements - Health outreach	Community investment records

Table 2.17 Implementation Arrangements

Activity	**Responsible**	**Timeline**
Local supplier registration	Contractor / PIU	Pre-construction (Month 1–2)
Local business awareness campaigns	PIU / Community Liaison Officer	Pre-construction (Month 1–2)
Local hiring plan	Contractor	Pre-construction (Month 1)
Skills training program	Contractor / PIU	Throughout construction
Procurement preference implementation	Contractor	Throughout construction
Monitoring and reporting	Contractor / PIU	Monthly

Table 2.18 Monitoring Indicators

Indicator	**Target**	**Frequency**	**Responsible**

Value of local procurement (₦)	≥50% of eligible procurement	Monthly	Contractor
Number of local suppliers engaged	≥10 per site	Monthly	Contractor
Number of local workers hired	≥50% unskilled; ≥30% skilled	Monthly	Contractor
Number of women-owned businesses engaged	≥20% of procurement	Monthly	Contractor
Number of workers trained	≥100 across LSHIP programme	Quarterly	Contractor / PIU
Community satisfaction with local content	≥80% satisfied	Quarterly	PIU / IESM

2.10 Conclusion

The alternatives analysis presented above satisfies AfDB ISS requirements by demonstrating that feasible options were evaluated at both the project level and the site level. The selected alternatives minimise environmental and social impacts while enhancing service delivery efficiency, community accessibility, and long-term sustainability.

The Lagos State Health Infrastructure Project (LSHIP) is fully justified by the severe deficiencies in Lagos State's healthcare infrastructure, the substantial economic, social, and environmental benefits it will deliver, and its alignment with national, state, and international development priorities.

The alternatives analysis demonstrates that:

- The no-project alternative is unacceptable, as it would perpetuate poor health outcomes, infrastructure decay, and limited access to essential services for vulnerable populations.
- Alternative options were considered for all facilities, but the preferred sites are optimal based on proximity to target populations, land availability, accessibility, and cost.
- The selection of existing facility footprints and government-owned land successfully avoids all physical displacement. Where temporary economic displacement may occur (e.g., restricted access for informal roadside traders or waterfront users at Agboyi, Gberefu, and Ibereko), the integration of a Livelihood Restoration Plan (LRP) is the preferred approach to mitigate these socio-economic impacts.

- Site-specific engineering and construction alternatives—such as elevated platforms at Agboyi and strict zero-discharge protocols at the Gberefu waterfront—were selected to directly minimise potential adverse environmental impacts, particularly concerning soil erosion, groundwater contamination, and the sensitive aquatic ecology of coastal and riverine corridors.
- Green building design is preferred over conventional design due to improved energy efficiency, reduced operational costs, and alignment with AfDB climate-smart infrastructure principles.
- Climate-resilient design is essential given Lagos's vulnerability to flooding, heatwaves, and rising coastal environmental pressures.
- An AfDB-aligned Healthcare Waste Management Plan (HMWMP) is mandatory and preferred over open burning or uncontrolled disposal.
- Local content and economic development are integrated into project design to maximise community benefits through job creation, procurement opportunities, and skill development.

This ESIA report covers only Group 8 Axis, comprising Agboyi, Gberefu, and Ibereko PHCs. The preferred option for this cluster—comprising construction & refurbishment and/or improvement works with climate-resilient design, appropriate drainage, service optimisation, and AfDB-aligned waste management—is environmentally and socially sound. It delivers substantial public health benefits to residents of the Group 8 Axis and creates local employment and business opportunities. The project is therefore recommended for approval by the Federal Ministry of Environment (FMEnv) and the African Development Bank (AfDB).

CHAPTER 3 – PROJECT & PROCESS DESCRIPTION

3.1 Background & Overview

The Lagos State Health Infrastructure Project (LSHIP) is a US$200 million AfDB-financed programme designed to fundamentally transform healthcare delivery across Lagos State. The project addresses critical gaps in primary healthcare infrastructure through a coordinated, multi-component strategy that integrates physical infrastructure, diagnostic capacity, and climate-resilient engineering.

The project is implemented by the Lagos State Ministry of Health (LSMoH) through a dedicated Project Implementation Unit (PIU). For the Badagry Axis – Group 8, the intervention focuses on the "Total Revitalization" of three strategically located facilities that serve as critical lifelines for isolated riverine and island communities.

Project Component & Intervention Mapping: Badagry Axis - Group 8

Component	Description	Badagry Axis - Group 8 Sites	Intervention Type
Component 1: Primary Health Infrastructure	Climate-resilient PHC Revitalization	3 (Ibereko, Gberefu, and Agboyi PHCs)	Total Revitalization (Comprehensive refurbishment, structural stabilization, and clinical expansion).

3.2 Project Location – (Badagry Axis – Group 8)

3.2.1 Geographic Overview

The Badagry Axis – Group 8 is a geographically complex cluster within the LSHIP. It is characterized by its transition between the mainland, lagoon islands, and flood-prone riverine enclaves, all of which dictate specialized logistical, engineering requirements and environmental requirements of the healthcare facilities.

1. Geographic Positioning

The Group 8 cluster spans both the Badagry and Kosofe Local Government Areas, creating a unique cross-administrative corridor:

- **Coastal-Island Corridor:** The facilities are located along the peninsula between the Badagry Lagoon and the Atlantic Ocean. This positioning subjects the sites to high humidity and a saline-rich atmosphere.

- **Riverine Enclaves:** Agboyi PHC is located within a cluster of three enclaves (Agboyi I, II, and III) surrounded by the Ogun and Maidan Rivers, characterized by extreme fluvial dynamics.
- **Transit Anchor:** Ibereko PHC sits along the Lagos-Badagry Expressway, serving as a gateway facility for both residents and transient populations.

2. Site-Specific Coordinates and Locations

Facility	Specific Location	Geographic Context
Ibereko PHC	Ibereko Community, Olorunda LCDA	Situated along the expressway; a mainland anchor currently in a "distressed" structural state.
Gberefu PHC	Gberefu Island, Badagry	A historical island site (Point of No Return) accessible only via boat; serves 16,000 residents.
Agboyi PHC	Agboyi Island, Kosofe	A natural floodplain with no motorable roads; residents rely entirely on wooden canoes for access.

3. Environmental and Terrain Characteristics

The geographic overview of Group 8 highlights several "Environmental Stressors" that influenced the ESIA (Environmental and Social Impact Assessment) and structural design:

- **High Water Table:** Shallow groundwater levels (1–2 meters) at all sites necessitate specialized foundation treatments and raised floor slabs.
- **Saline and Fluvial Stressors:** The high saline content at Gberefu/Ibereko and the 5-meter flood cycles at Agboyi require non-corrosive materials and extreme floodproofing.
- **Ecological Sensitivity:** The sites are adjacent to "Likely Critical Habitats" including red mangroves (*Rhizophora racemosa*) and sensitive riverine wetlands.

4. Accessibility and Connectivity

- **Waterborne Access:** Both Gberefu and Agboyi rely on boat transport. This creates a logistical bottleneck for emergency obstetric care and material delivery.
- **Referral Logistics:** The facilities feed into the Badagry and Ikorodu General Hospitals. Geographically, Group 8 is mapped as the primary feeder for the Badagry General Hospital. The ESIA ensures that the transit routes between these PHCs and the secondary facility are considered for emergency medical evacuations. The ESIA assesses the transit time across water bodies for emergency medical evacuations.

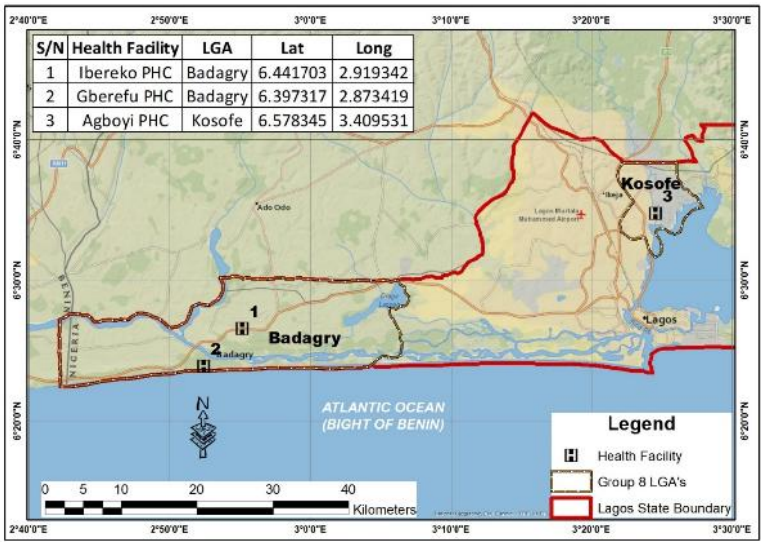


Figure 3.1a – Map of Badagry Axis - Group 8 showing all 3 project sites



Figure 3.1b Satellite-Based Cluster Map Showing the Spatial Location of Ibereko Primary Health Centre and Its Surrounding Environment



Figure 3.1c Satellite-Based Cluster Map Showing the Spatial Location of Gberefu Primary Health Centre and Its Surrounding Environment

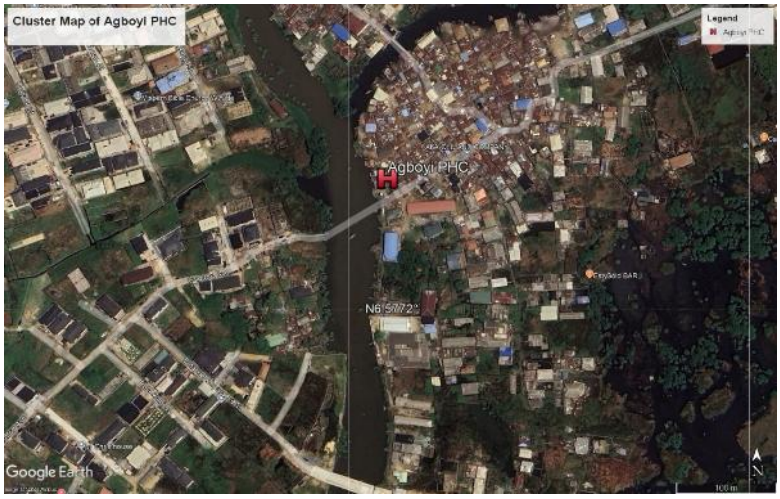


Figure 3.1d Satellite-Based Cluster Map Showing the Spatial Location of Agboyi Primary Health Centre and Its Surrounding Environment

3.2.2 Site Summary

Below is the site information table for the Badagry Axis – Group 8, detailing the locations and project types for the three primary health centers.

Table 3.1 – Badagry Axis - Group 8 Sites Overview

S/N	Site Name	LGA/LCDA	GPS Coordinates	Address/Landmark	Project Type
1	Ibereko PHC	Badagry/Olorunda	6.441703, 2.919342	Off Lagos-Badagry Expressway	Refurbishment
2	Gberefu PHC	Badagry/Badagry	6.397317, 2.873419	Gberefu Island (Point of No Return)	Refurbishment
3	Agboyi PHC	Kosofe/Agboyi-Ketu	6.578345, 3.409531	Agboyi Island Enclave	Refurbishment

Technical Note:

- **Ibereko PHC** is designated for revitalization to address significant wall cracks and "rising damp" in a distressed structure.
- **Gberefu PHC** requires "Total Revitalization" as it is currently abandoned and overrun by bats, reptiles, and thickets.
- **Agboyi PHC** involves a clinical expansion and floodproofing to account for the annual 5-meter water rise.

3.2.3 Cluster 2 Characteristics

Based on the Volume 1 – Badagry Axis (Group 8) ESIA report and the environmental baseline for the Iberefu, Gberefu and Agboyi corridor, the following physical and social characteristics define the project area:

1. **Topography:** flat low-lying plains (0.5m–3.0m ASL). Agboyi and Gberefu are at or near sea level, making them vulnerable to sea-level rise.
2. **Hydrology:** Surrounded by the Badagry Lagoon, Ogun River, and Maidan River. Groundwater is highly susceptible to saltwater intrusion.
3. **Land Use:** Mix of historical cultural heritage (Gberefu slave route), artisanal fishing communities, and high-density "slum/squatter" enclaves in Agboyi.
4. **Cultural Values:** Gberefu Island holds immense global significance as the "Point of No Return." Construction must respect the Spirit Attenuation Well and historical monuments.

3.3 Project Particulars

Below are the project particulars for the Badagry Axis (Group 8), covering the Ibereko, Gberefu and Agboyi Primary Healthcare Centres (PHCs).

1. Project Overview

The LSHIP for Group 8 focuses on restoring healthcare to "healthcare deserts." The objective is to provide 24/7 functional hubs on islands where residents previously faced preventable maternal and infant deaths due to isolation, by implementing infrastructure modernization and ensuring environmental sustainability.

2. Site-Specific Scopes of Work

PHC Location	Development Strategy	Key Engineering/Structural Focus
Ibereko PHC	Structural Revitalization	Remediation of wall cracks; chemical damp-proofing for rising damp; roof carcass replacement and Water, Sanitation, and Hygiene (WASH) upgrades.
Gberefu PHC	Total Revitalization	Biological decontamination (bats/reptiles); 24/7 clinical reconfiguration, Extensive repair of roofing decay, electrical retrofitting, and modernization of patient flow areas.
Agboyi PHC	Resilient Expansion	Foundation elevation for 5m flood cycles; reconfiguration for canoe-based patient arrivals; kiosk relocation.

3. Technical & Environmental Design Requirements

Due to the coastal location within the **Badagry West LCDA**, it is important technical safeguards are prioritized in order to strengthen climate resilience, through the integration of flood-mitigation designs and high-durability materials capable of withstanding salt-air corrosion and high humidity. Also, energy solutions, which involve the implementation of hybrid solar power systems to ensure 24/7 operational capacity for critical emergency lighting and cold-chain storage should be considered. Regarding WASH and waste management, the facilities will utilize specialized medical waste systems and upgraded sanitation infrastructure specifically designed to prevent groundwater contamination within the coastal ecosystem. Finally, universal design principles should be applied to provide full accessibility for elderly patients and persons with disabilities.

4. Socio-Economic Impact

The project will prioritize vulnerability mitigation by addressing the high climate risks inherent to the coastal corridor. This initiative is expected to boost service delivery by increasing facility utilization rates for immunizations and maternal services. Furthermore, operational efficiency will be improved by transitioning from manual tracking systems to modern, tech-enabled facility management standards.

3.3.1 Revitalization Strategy – Badagry Axis – Group 8

Table 3.2 – Facilities in Badagry Axis – Group 8

Facility	LGA/LCDA	Safeguard Requirement	Key Rationale
Ibereko PHC	Badagry/Olorunda	ESMP	Strategic roadside facility; requires immediate abatement of structural distress and rising damp.
Gberefu PHC	Badagry/Central	ESIA	High sensitivity due to cultural heritage (slave route) and island logistics.
Agboyi PHC	Kosofe/Agboyi-Ketu	ESIA + RAP	Triggers involuntary resettlement (1 kiosk) and extreme flood hazard engineering.

3.3.2 Design Features (Group 8 Standard)

The following design features are tailored to the specific geographical and socio-economic challenges of the Badagry coastal corridor, focusing on durability, energy independence, and community accessibility.

Table 3.3 – PHC Design Features tailored for Group 8

Feature	Technical Specification	Environmental & Social Benefits
Flood-Resilient Substructure	Reinforced concrete raft foundations and elevated slabs (0.5m minimum above flood stage).	Environment: Prevents structural damage during seasonal flooding. Social: Ensures facility survival during annual 5-meter fluvial flood cycles at Agboyi.
Corrosion-Resistant Materials	Marine-grade aluminum-zinc roofing; salt-resistant external metalwork.	Environment: Extends lifecycle in high-salinity coastal environments.

		Social: Lowers long-term maintenance costs for the local healthcare board.
Hybrid Solar Power	Photovoltaic (PV) arrays with lithium-ion battery storage and smart inverter systems.	Environment: Reduces carbon footprint and reliance on fossil-fuel generators. Social: Guarantees 24/7 power for vaccine cold-chains, emergency lighting, and nighttime deliveries.
Barge-Ready Logistics	Reconfiguration of site boundaries to allow for waterfront material delivery.	Social: Minimizes disruption of narrow pedestrian community paths during work.
Universal Accessibility	Anti-skid ramps with 1:12 gradients and widened doorways.	Environment: Promotes efficient use of space within the existing footprint. Social: Ensures inclusive access for the elderly and canoe-arriving patients.

3.4 Project Particulars – Refurbishment

The refurbishment of Ibereko, Gberefu and Agboyi facilities transforms degraded structures into high-performance healthcare hubs, specifically addressing PHCs focuses on transforming existing, degraded structures into modern, climate-resilient healthcare hubs. These facilities serve high-density riverine and coastal populations where infrastructure decay has historically hindered service delivery.

Table 3.4: Refurbishment Scope by Activity

Activity Category	Specific Scope of Works
Civil & Structural	Stripping salt-corroded plaster; chemical DPC application; repairing wall cracks (Ibereko).
Roofing & Ceiling	Removal of corroded sheets; installation of marine-grade aluminum-zinc roofing and moisture-resistant PVC ceilings.
M&E Installations	Full electrical retrofitting for Hybrid Solar Systems; installation of energy-efficient LED lighting and inverter-compatible ACs.

Island Logistics	Deployment of motorized barges for material transport; waterfront sediment control.
MCH Reconfiguration	Vertical/Horizontal expansion to create dedicated labor rooms and neonatal stabilization zones.
Staff Housing	(Gberefu specific) Construction of on-site quarters to ensure 24/7 service availability.

Site-Specific Sensitivities – Refurbishment

The refurbishment phase for Ibereko, Gberefu and Agboyi must manage the following sensitivities to ensure project success and safeguard compliance:

The table below outlines the critical environmental and social sensitivities that must be managed during the refurbishment of the three PHCs.

Sensitivity Category	**Management Requirement**	**Objective**
Heritage Protection	Zero-encroachment zones for the Gberefu "Point of No Return" monuments.	To preserve international tourism and cultural assets during construction.
Flood Isolation	Elevated storage for all construction materials to prevent siltation during fluvial rises.	To maintain material integrity and prevent lagoon siltation.
Coastal Groundwater Protection	Construction activities must strictly prevent any chemical or sewage leakage into the shallow groundwater table.	To protect the fragile riverine ecosystem and maintain the safety of local water sources.
Service Continuity	Refurbishment must be phased, and temporary clinical stations must be established for essential care.	To ensure uninterrupted access to immunizations and maternal services for riverine residents.
Salt-Air Corrosion	All new installations (window frames, doors, and conduits) must be rated for high-salinity environments.	To prevent premature material failure and reduce long-term maintenance costs in a coastal climate.

Community Access	Logistics must account for limited road access, often requiring monitored water-based transport for materials.	To manage the logistical challenges of the Badagry West axis while mitigating the risk of fuel spills into the lagoon.
Waste Management	Safe decommissioning and disposal of hazardous old materials must strictly follow ESMP protocols.	To ensure the responsible handling of legacy materials like contaminated plumbing or corroded roofing.



Plate 3.1 – Ibereko PHC

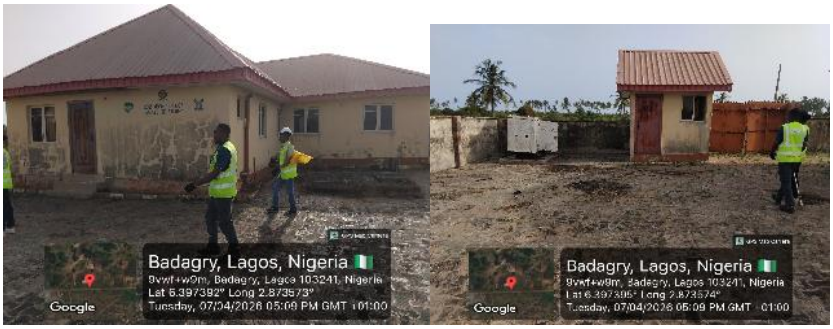


Plate 3.2 – Gberefu PHC (before refurbishment) – asbestos roofing suspected

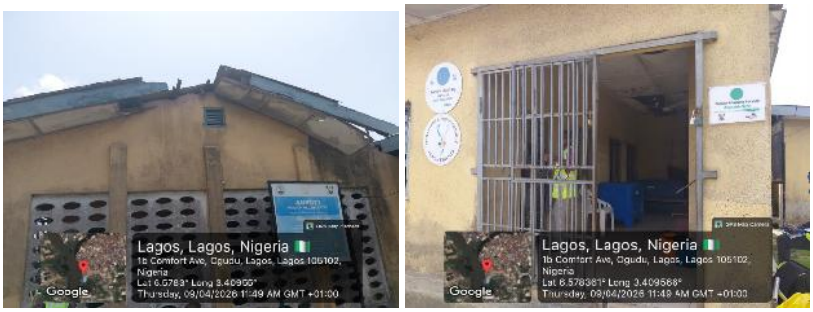


Plate 3.3 – Agboyi PHC (before refurbishment) – waterfront location

3.5 Process Description

3.5.1 Pre-Construction Phase

The pre-construction phase for Group 8 is critical for finalizing the waterborne logistics plan and completing necessary resettlement actions.

Table 3.5 – Pre-Construction Activities for Group 8 Axis

Activity	Description	Duration	Responsible	E&S Considerations
Site Handover & Mobilization	Formal handover of Ibereko, Gberefu, and Agboyi sites to contractors; establishment of temporary laydown areas.	2 Weeks	LSMoH / PIU	Ensure site clearing does not disrupt local community access or damage adjacent private properties.
Topographic & Hydrogeological Surveys	Detailed mapping of elevations and groundwater levels to finalize foundations for 5m flood resilience at Agboyi.	3 Weeks	Lead Engineering Consultant	Identifying flood-prone zones to minimize land disturbance and avoid siltation of nearby water bodies.

Stakeholder & Community Engagement	Town hall meetings with Obas, Baales, and residents in Badagry and Agboyi-Ketu to discuss project timelines.	Ongoing (Pre-start)	Safeguards Team / LSHIP PIU	Addressing concerns regarding service disruptions and prioritizing local labor recruitment for island youth.
Agboyi RAP Execution	Implementation of the Resettlement Action Plan; full compensation for the affected commercial kiosk owner.	4 Weeks	PIU	Ensuring zero physical or economic displacement before construction activities begin on the island.
Asbestos Surveys	Specialized laboratory sampling of old roofing materials at Ibereko and Gberefu facilities.	2 Weeks	Licensed Contractor	Identifying and demarcating carcinogenic risks to prevent fiber release during stripping.
Baseline Air & Water Quality Testing	Recording pre-construction parameters (PM, noise, E. coli) to monitor future construction impacts on rivers.	1 Week	Environmental Specialist	Providing the benchmark for compliance with NESREA and AfDB pollution standards.
Waterborne Logistics Plan	Finalizing motorized barge routes and docking areas for material mobilization	3 Weeks	Contractor	Minimizing disruption to artisanal fishing grounds and canoe-

	to Gberefu and Agboyi islands.			based community transport paths.
Heritage Protocol Setup	Demarcating physical buffers and vibration-monitoring zones around Gberefu historical slave route landmarks.	1 Week	Contractor / PIU	Preventing structural or spiritual damage to the Spirit Attenuation Well and the "Point of No Return" monuments.
Development of Site-Specific ESMP	Tailoring management plans to address risks like saltwater intrusion, aquatic spills, and medical waste porterage.	4 Weeks	Environmental Consultant	Ensuring all mitigation measures for the riverine ecosystem are documented and integrated into the works contract.
Permitting & Regulatory Approvals	Obtaining clearances from LASEPA, NIWA, the Lagos State Safety Commission,(for waterways), and relevant Lagos State planning authorities.	4–6 Weeks	LSHIP PIU / Contractor	Ensuring full legal compliance to prevent delays related to environmental or waterway usage laws.
Temporary Service Setup	Establishment of temporary clinical booths or boat-based stations to maintain maternal services during works.	3 Weeks	Facility Managers / Contractor	Ensuring the temporary site remains safe, hygienic, and accessible for

				canoe-arriving patients.

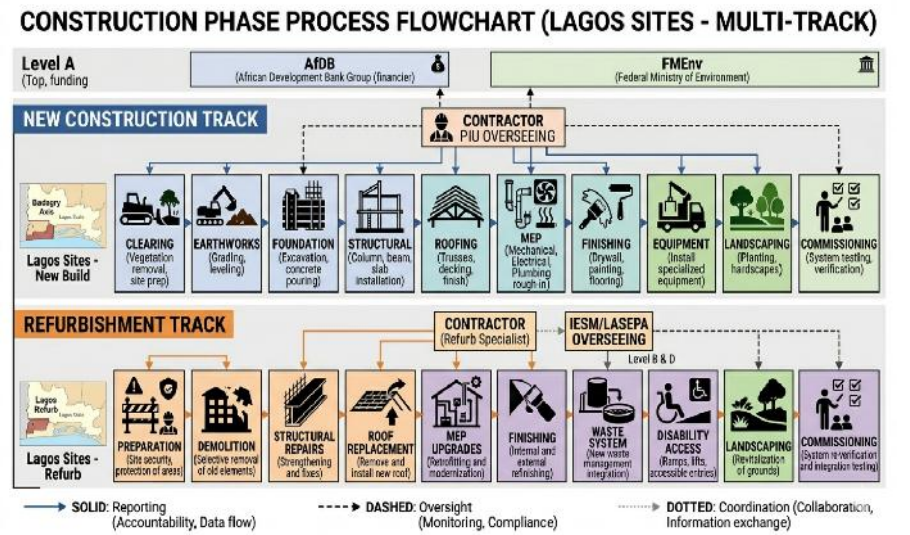


Figure 3.2 – Pre-construction process flowchart

3.5.3 Construction Phase – Refurbishment (3 Sites)

The refurbishment phase is characterized by "Total Revitalization," focusing on restoring sterility to environments like Gberefu which have been overrun by wildlife. Also, because these works occur within active or semi-active clinical environments in a riverine corridor, the focus is on speed, material durability, and maintaining community access.

Table 3.6 – Construction Activities for Group 8 Sites

Phase / Activity	Description	Duration	E&S Considerations
Site Preparation & Clearing	Biological clearing of infestations (bats/reptiles); removal of salt-corroded plaster, tiles, and partitions.	2–3 Weeks	Safety: Zoonotic disease prevention (OHS) and proper debris containment to prevent coastal drainage blockage.
Structural Remediation & Damp-Proofing	Structural patching; application of chemical	4 Weeks	Chemical Safety: Preventing toxic chemical leaching into the shallow groundwater table.

	DPCs and medical-grade anti-microbial barriers.		
Logistics & Water-Based Porterage	Transporting construction materials (blocks, steel, and cement) via barges and manual carriage.	Ongoing	Safety: Strict boat safety protocols; mandatory use of life jackets to prevent drowning.
Roofing & Cooling Upgrades	Marine-grade aluminum-zinc sheets; moisture-resistant PVC ceilings; "cool roof" coatings and oversized windows.	3 Weeks	OHS/Climate: Fall protection for workers; managing legacy material disposal (asbestos risk); reducing heat stress for patients.
M&E Retrofitting & Solar	Energy-efficient rewiring; installation of Hybrid Solar PV arrays and battery storage.	4 Weeks	Resource Efficiency: Responsible recycling of old copper wiring and sustainable sourcing of solar components.
WASH & Plumbing Upgrades	Modernizing toilets; installing solar-powered borehole pumps; constructing non-permeable septic tanks.	4 Weeks	Sanitation: Preventing raw sewage discharge into the riverine ecosystem during system transition.
Finishing & Accessibility	Anti-corrosive painting (Low-VOC); installation of PWD-compliant anti-skid ramps and perimeter drainage.	3 Weeks	Health & Access: Low-VOC paints for indoor air quality; ensuring inclusive facility access for PWDs and the elderly.

3.6 Project Resources

3.6.1 Labour Requirements

This table outlines the workforce composition required during the peak refurbishment phase for Ibereko, Gberefu and Agboyi PHCs. The strategy emphasizes local content and minimizing the environmental footprint of the workforce in the riverine corridor.

Table 3.7 – Labour Requirements by Category (Group 8)

Labour Category	Estimated Number	Source	Accommodation
Skilled (Engineers, Solar Techs)	12–15	Main Contractor (Lagos-based)	Off-site; local guest houses (Badagry/Kosofe) or daily transport from surrounding urban hubs.
Semi-Skilled (Masons, Plumbers)	25–30	Local sub-contractors within Badagry West LCDA and Agboyi Ketu LCDA	Community-based (within Axis).
Unskilled (Cleaners, Porters)	40–50	Immediate host Communities	Community-based; "Zero-Camp" policy.
Safeguards & Security (E&S Officers, HSE, Site Security)	8 – 10	Contractor and local community vigilante groups	Security resides locally; E&S/HSE officers use regional off-site housing.
Total Peak Workforce	85–105	Mixed	Non-Residential

3.6.2 Material Requirements

The material strategy for the Ibereko, Gberefu and Agboyi sites prioritizes durability against the aggressive saline environment and logistics adapted for the riverine terrain of Badagry West.

Table 3.8 – Material Requirements (Group 8)

Material	Estimated Quantity	Source	E&S Consideration
Sulfate-Resistant Cement	~4,500 – 6,000 bags	Local distributors (Badagry/Agbara)	GHG Emissions: Selection of suppliers with sustainable manufacturing; dust control during on-site mixing.
River Sand & Sharp Sand	~1,200 – 1,500m³	Licensed local burrow pits in Lagos/Ogun	Ecological Impact: Ensuring sand is sourced from approved inland sites to

			avoid coastal erosion or beach degradation.
Granite / Crushed Rock	~900 – 1,100m³	Inland quarries (Ogun State corridor)	Health, Safety & Transport Risks: Managing "carbon miles" alongside strict occupational and community road safety protocols. This includes enforcing speed limits, ensuring driver training, covering heavy loads with tarpaulins to prevent road spills, and avoiding peak traffic hours to minimize accident risks along local access routes.
Reinforcement Steel (Various diameters)	~45 – 60 Tons	Regional suppliers (Lagos/Group 8 Axis context)	Resource Efficiency: Proper sizing and cutting schedules to minimize scrap metal waste.
Marine-Grade Aluminum-Zinc Roofing	~2,200 – 2,800m²	Specialized regional manufacturers	Longevity: Reducing future waste by using materials that resist salt-air corrosion for 25+ years.
Solar PV Panels & Lithium Batteries	~120 – 150 Panels / 45 Batteries	Verified LSHIP technology partners	E-Waste: Ensuring a battery "take-back" agreement is in place for end-of-life disposal.
Potable Water (Construction)	~250,000 – 350,000 Litres	Licensed water tankers / On-site boreholes	Groundwater Table: Monitoring extraction rates to prevent saltwater intrusion into the local aquifer.
Anti-Corrosive Paints & Sealants	~800 – 1,000 Gallons	Regional manufacturers	Air Quality: Strictly using Low-VOC (Volatile Organic Compound) products for indoor clinical safety.

3.6.3 Equipment Requirements

The equipment deployment for the Ibereko, Gberefu and Agboyi sites is scaled to accommodate both the sensitive refurbishment needs of existing structures in the coastal terrain.

Table 3.9 – Equipment Requirements

Equipment	Estimated Quantity	Fuel / Power	E&S Consideration
Excavator / Backhoe	1 – 2 Units	Diesel	Noise & Vibration: Restricted hours of operation to minimize disturbance to patients in nearby active wards.
Concrete Mixer (Mobile)	3 – 4 Units	Diesel / Petrol	Soil Protection: Must be operated on lined surfaces to prevent cement slurry runoff into the coastal soil.
Vibratory Plate Compactor	2 Units	Petrol	Structural Safety: Monitored use near existing PHCs structures to prevent vibration-induced cracks.
Water Tanker (10,000L)	2 Units	Diesel	Dust Suppression: Used to dampen site surfaces during dry periods to maintain local air quality.
Dumper Truck (Small/Medium)	3 Units	Diesel	Traffic Management: Strict speed limits within the LCDA to ensure the safety of pedestrians and local residents.
Light Commercial Vehicles (Pickup)	3 – 5 Units	Petrol	Logistics: Used for transport of tools and light materials; must be well-maintained to prevent oil leaks.
Pumping Machines (Submersible)	4 Units	Electric / Petrol	Water Management: Used for dewatering foundations; discharge must be filtered to prevent lagoon siltation.
Hand-held Power Tools	Various	Electric (Battery/Gen)	Safety: Use of silenced portable generators and double-insulated tools to reduce electrical risks in humid conditions.
Barges / Support Boats	1 – 2 Units	Marine Diesel	Aquatic Safety: Essential for material transport to riverine sites; must have

			spill kits on board to protect the lagoon.

Key Equipment Management Protocols

- Maintenance Logs: All heavy machinery (excavators and trucks) must undergo regular maintenance to prevent fuel or hydraulic fluid leaks, which are particularly hazardous in the Badagry West riverine ecosystem.
- Spill Containment: Contractors are required to maintain drip trays under all stationary motorized equipment and keep spill kits (absorbent mats/sand) readily available at each site.
- Fuel Storage: Fuel for equipment must be stored in a centralized, bunded area with secondary containment to prevent accidental discharge into the high-water-table soil.
- Decommissioning: Upon project completion, all equipment and any contaminated soil from the workshop area must be removed and the site restored according to the ESMP restoration guidelines.

3.7 Environmental Releases & Waste – Badagry Axis

3.7.1 Air Emissions

Table 3.10 – Air Emission Sources and Mitigation (Badagry Axis)

Source	Pollutant	Mitigation
Earthworks	Dust (PM10, PM2.5)	Water spraying (3× daily dry season)
Vehicle traffic	PM10, PM2.5, NOx, SO2, CO	Low-sulphur diesel; speed limits; maintenance
Generators (construction)	PM10, PM2.5, NOx, SO2, CO	Low-sulphur diesel; maintenance; limit use
Open burning (prohibited)	PM, dioxins, furans	Prohibited – enforce through CESMP

3.7.2 Noise

Table 3.11 – Noise Sources and Levels (Badagry Axis)

Source	Typical Noise Level (dB(A) at 10 m)	Mitigation
Excavators	75–85	Restrict hours (7:00–18:00)
Bulldozers	80–90	Restrict hours

Concrete mixers	70–80	Restrict hours
Generators	70–80	Enclosures, silencers
Trucks	70–80	Speed limits; restrict hours
Construction activities (hammering, etc.)	80–100	Restrict hours; noise barriers near sensitive receptors

Noise limits (NESREA): Residential daytime 55 dB(A), nighttime 45 dB(A) (National Environmental Standards and Regulations Enforcement Agency, 2009).

3.7.3 Wastewater

Table 3.12 – Wastewater Sources and Management (Group 8 Axis)

Source	Volume (Typical)	Pollutants	Mitigation
Construction – concrete wash water	1–5 m³/day per site	High pH (11–13), suspended solids	Contain; neutralise; settle; reuse or dispose (licensed)
Construction – dewatering	5–50 m³/day per site	Suspended solids	Settle before discharge (silt fence, sediment trap)
Construction camp – sewage 5–20 m³/	day per camp BOD, coli	forms, nutrients Portable	toilets + septic tank; LAWMA collection
Construction camp – greywater	10–50 m³/day per camp	Detergents, suspended solids	Soakaway or septic tank
Operation – clinical wastewater (PHC)	5–20 m³/day	Pathogens, blood, chemicals (lab), pharmaceuticals	Septic tank (soakaway) – no discharge to water bodies

3.7.4 Solid Waste

Table 3.13 – Solid Waste Types and Management (Group 8 Axis)

Waste Type	Source	Quantity (Estimated)	Hazardous?	Mitigation

Construction waste – inert	Concrete, blocks, bricks, tiles	500–2,000 tonnes (per site)	No	Reuse as fill; recycle (crushed concrete); dispose at licensed landfill
Construction waste – wood	Formwork, pallets	50–200 tonnes (per site)	No	Reuse; recycle; donate
Construction waste – metal	Scrap steel, rebar, offcuts	10–50 tonnes (per site)	No	Recycle (scrap dealers)
Hazardous waste – asbestos	Roofing, insulation (Ibereko, Gberefu – if confirmed)	10–100 tonnes (per site)	**Yes**	Licensed abatement; double-bag; labeled transport; hazardous waste landfill
Hazardous waste – fuels/oils	Spills, maintenance	1–5 tonnes (total)	Yes	Bunded storage; spill kits; licensed disposal
Medical waste – infectious	Dressings, swabs, lab waste	50–500 kg/day (per facility)	Yes	HMWMP; autoclave; LAWMA disposal
Medical waste – sharps	Needles, scalpels, syringes	10–100 kg/day (per facility)	Yes	Sharps containers; incineration
Medical waste – pharmaceutical	Expired drugs	1–10 kg/day (per facility)	Yes	Return to manufacturer; incineration
General waste (operation)	Paper, food, packaging	100–500 kg/day (per facility)	No	LAWMA collection; recycling

3.8 Traffic Status & Forecast – Badagry Axis

3.8.1 Baseline Traffic

The baseline traffic for Group 8 is divided between the high-volume road corridor of Ibereko and the waterborne transit routes essential for Gberefu and Agboyi. The Lagos-Badagry Expressway is a primary international artery, while the islands depend on motorized barges and wooden canoes.

Table 3.14 – Baseline Traffic/Transit by Site

Site	Primary Access Route	Estimated Daily Volume (AADT/Trips)	LOS	Peak Hours
Ibereko	Lagos-Badagry Expressway	12,000 – 15,000 vehicles	C – D	6:30–9:30, 16:00–19:30
Gberefu	Badagry Lagoon (Boat)	80 – 120 boat trips	A (Waterway)	7:00–9:00, 15:30–17:30
Agboyi	Ogun River/Canals (Canoe)	600 – 1,000 canoe trips	B (Waterway)	6:00–9:00, 16:00–18:30

Source/basis: Baseline road volumes are indicative AADT ranges derived from desktop review of the Lagos–Badagry Expressway corridor; waterway transit figures are based on site reconnaissance of the Gberefu and Agboyi landings. These figures require confirmation by a dedicated traffic count/origin–destination survey prior to disclosure.

3.8.2 Construction Traffic Forecast

Construction traffic for Group 8 must account for the specialized 18-week diversions currently active on the Lagos-Badagry Expressway and the deployment of motorized barges for island material delivery.

Table 3.15 – Construction Traffic Forecast (Badagry Axis - Group 8)

Activity	Additional Daily Trips (Per Axis)	Mode of Transport	Mitigation
Material Delivery	10 – 20	Heavy Trucks / Barges	Schedule off-peak; utilize NIWA-certified barges for islands.
Worker Transport	5 – 10	Buses / Motorized Boats	Enforce life jacket use; prioritize local hiring to reduce transit.
Equipment Mobilization	1 – 2	Low-bed Trailers / Barges	Night mobilization for Ibereko; tide-aligned barge movement.
Waste Haulage	2 – 4	Skip Trucks / "Barge-to-Truck"	Covered loads; strict manifest system to Marina transfer stations.

3.8.3 Operation Traffic Forecast

Post-revitalization, patient traffic at the island sites is expected to be dominated by pedestrian and canoe-based arrivals, while Ibereko will serve as a regional roadside anchor.

Table 3.16 – Operation Traffic Forecast (Group 8 – Per Facility)

Facility	Estimated Daily Patient Visits	Estimated Staff	Estimated Mode of Arrival
Ibereko PHC	150 – 300	15 – 25	Road (Private/Public)
Gberefu PHC	100 – 200	10 – 15	Water (Boat/Canoe) / Walking
Agboyi PHC	400 – 600	25 – 35	Water (Canoe) / Walking

3.8.4 Traffic Management Plan (TMP)

All Group 8 sites will implement a TMP (Appendix 11) including:

- **Expressway Signage (Ibereko):** Warning signs for heavy vehicle entries along the Badagry-bound lane.
- **Flag persons** (where needed)
- **Waterway Safety (Gberefu/Agboyi):** No-wake zones near site docking areas and mandatory safety induction for all boat-based personnel.
- **Delivery Scheduling:** Restrictions during morning chokepoints on the Mazamaza and Iyana-Iba bridge corridors.
- **Worker transport** (minimise private car use – use buses)
- **Emergency Access:** Dedicated, unblocked canoe landing zones for medical emergencies at Agboyi.

3.9 Project Schedule – Badagry Axis

3.9.1 High-Level Schedule

The Group 8 schedule is front-loaded with the Agboyi RAP and Gberefu historical site protocols to ensure safeguard compliance before physical works.

Table 3.17 – High-Level Project Schedule (Badagry Axis - Group 8)

Phase	Duration	Start (Target)	End (Target)
Pre-construction (RAP, Asbestos, Design, NIWA Permits)	6 – 12 months	Q2 2026	Q1 2027

Construction/Refurbishment (3 sites)	12 – 24 months	Q2 2027(first site)	Q3 2028 (last site)
Commissioning & Equipment	1 – 3 months	Q3 2028	Q4 2028
Operation	50+ years	Q1 2029	N/A

3.9.2 Detailed Schedule (Typical PHC Refurbishment – 12 months)

Table 3.18 – Detailed Construction Schedule (Typical Group 8 Facility)

Activity	**M – Months**											
	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**	**M12**
Asbestos Abatement	■	■										
Waterborne Logistics Setup		■										
Structural Repairs (Damp-proof)			■	■	■							
Staff Housing (Gberefu only)				■	■	■	■					
Roofing & Envelope						■	■					
MCH Wing Configuration							■	■	■			
MEP & Solar Installation									■	■		
Finishing & Landscape											■	
Commissioning												■

Figure 3.7 – Project schedule Gantt chart for all 3 sites

3.10 Community Business and Employment Opportunities

The LSHIP presents significant opportunities for local communities in the Badagry Axis (Group 8). Beyond the direct health benefits, the project will generate employment, business opportunities, and economic development, adapted to the axis's riverine and island setting.

3.10.1 Employment Opportunities

Table 3.19 – Employment Opportunities – Badagry Axis (Group 8)

Labour Category	Estimated Number (Peak)	Source	Accommodation
Skilled (Engineers, Solar Technicians)	12–15	Main Contractor (Lagos-based)	Off-site; local guest houses (Badagry/Kosofe) or daily transport from surrounding urban hubs
Semi-skilled (Masons, Plumbers)	25–30	Local sub-contractors within Badagry West LCDA and Agboyi-Ketu LCDA	Community-based (within axis)
Unskilled (Cleaners, Porters)	40–50	Immediate host communities	Community-based; "Zero-Camp" policy
Safeguards & Security (E&S Officers, HSE, Site Security)	8–10	Contractor and local community vigilante groups	Security resides locally; E&S/HSE officers use regional off-site housing

Total estimated peak workforce for the Badagry Axis (Group 8): 85–105 workers (across 3 sites)

A defining feature of this axis's labour strategy is its "Zero-Camp" policy unlike axes where a dedicated worker accommodation camp is established, Group 8's workforce strategy deliberately avoids on-site or purpose-built worker housing, instead relying on community-based accommodation for local/semi-skilled labour and regional off-site housing for skilled/supervisory staff. This minimises the environmental footprint of the workforce in the riverine corridor and reduces several of the labour-influx risks (social tension, GBV/SEA/SH exposure from a concentrated worker camp) that arise at axes with on-site accommodation.

Local Hiring Targets by Site:

Site	Unskilled Local Hiring Target	Skilled Local Hiring Target	Rationale
Ibereko PHC	≥50% from Badagry LGA (Olorunda LCDA)	≥30% from Badagry LGA	Road-accessible community; established artisanal/fishing skills base
Gberefu PHC	≥50% from Badagry LGA (Badagry Central)	≥30% from Badagry LGA	Island community; barge/boat-handling skills locally available
Agboyi PHC	≥50% from Kosofe LGA (Agboyi-Ketu LCDA)	≥30% from Kosofe LGA	Distinct LGA from Ibereko/Gberefu; local hiring targets set independently to reflect Kosofe's own labour pool

Note: because Agboyi sits in Kosofe LGA, geographically and administratively separate from Ibereko and Gberefu in Badagry LGA, its local-hiring target is calculated against the Kosofe labour pool rather than the Badagry LCDA figures used for the other two sites.

3.10.2 Business and Supply Chain Opportunities

Table 3.20 – Business and Supply Chain Opportunities – Badagry Axis

Opportunity Type	Description	Target Beneficiaries
Material Supply	Supply of sulfate-resistant cement (~4,500–6,000 bags), river/sharp sand (~1,200–1,500 m3), blocks, roofing, plumbing, electrical materials	Local distributors (Badagry/Agbara, Ketu), licensed local borrow-pit operators
Barge and Canoe Transport	Waterborne haulage of materials and personnel to Gberefu and Agboyi	Local boat operators, licensed barge owners
Equipment Rental	Rental of construction equipment (mixers, compressors, generators)	Local equipment rental companies
Catering Services	Provision of meals for workers	Local caterers and food vendors

Accommodation Services	Off-site guest-house accommodation for skilled/supervisory staff (consistent with the Zero-Camp policy)	Local guesthouses in Badagry and Kosofe
Security Services	Site security, including community vigilante group engagement	Local security firms; community vigilante groups
Waste Management Services	Construction waste collection; support for the Barge-to-Truck medical-waste transfer system	Local waste management companies; licensed boat operators
Subcontracting	Specialised works (electrical, plumbing, roofing, damp-proofing/finishing)	Local contractors and artisans within Badagry West LCDA and Agboyi-Ketu LCDA

Barge and canoe transport is a business opportunity unique to this axis, reflecting the water-crossing dependency confirmed for Gberefu and Agboyi in Chapter 1 (Section 1.8) and should be prioritised for local licensed boat operators as both an economic-inclusion measure and a safety-management requirement.

3.10.3 Women and Youth Employment Opportunities

Table 3.21 Women and Youth Employment Targets

Category	Target	Actions
Women in Construction	≥15% of total workforce	Targeted recruitment; skills training; flexible working arrangements; childcare support where feasible
Women in Supply Chain	≥20% of local procurement from women-owned businesses	Supplier registration; business training; access to procurement information
Youth Employment	≥30% of unskilled workforce	Apprenticeship programs; skills training; mentorship from skilled workers

Youth Skills Training	≥30 youth trained in construction and boat-handling/logistics skills	On-the-job training; vocational training partnerships; certification support – reflecting the axis's distinctive reliance on waterborne logistics

3.10.4 Community Benefits Monitoring

Table 3.22 Community Benefits Monitoring Indicators

Indicator	Target	Frequency	Responsible
Local hiring (unskilled)	≥50% from host LGA (Badagry or Kosofe, per site)	Monthly	Contractor
Local hiring (skilled)	≥30% from host LGA	Monthly	Contractor
Local procurement (materials)	≥50% of eligible materials	Monthly	Contractor
Local subcontracting (incl. boat operators)	≥40% of eligible subcontracts	Monthly	Contractor
Women in workforce	≥15% of total workforce	Monthly	Contractor
Women-owned business procurement	≥20% of local procurement	Monthly	Contractor
Youth trained	≥30 across the axis	Quarterly	Contractor / PIU
Zero-Camp policy compliance	100% (no on-site worker camp established)	Monthly	Contractor / PIU
Community satisfaction	≥80% satisfied	Quarterly	PIU / IESM

3.11 Post-Construction Reinstatement

All temporary facilities and disturbed areas shall be reinstated upon completion of construction, in accordance with FMEnv requirements and AfDB ISS standards. The Contractor shall be responsible for reinstatement, with costs included in the construction budget.

3.11.1 Temporary Facilities Reinstatement

Facility	Reinstatement Action	Timeline

Worker Accommodation Camp	Not applicable – the axis's Zero-Camp policy means no dedicated worker camp is established; no camp-site reinstatement is therefore required	N/A
Laydown/Storage Areas	Remove all materials and debris; grade and compact; revegetate	Within 30 days of construction completion
Equipment Parking Areas	Remove all equipment; repair surface damage; restore drainage	Within 30 days of construction completion
Barge Landing / Temporary Jetty Areas (Gberefu, Agboyi)	Remove temporary landing structures and mooring points; restore riverbank/shoreline profile; ensure no debris remains in the water	Within 30 days of construction completion

3.11.2 Access Reinstatement

Site	Access Type	Reinstatement Action	Responsible
Ibereko	Road-accessible	Repair potholes; regrade access sections; restore drainage channels	Contractor
Gberefu	Barge/canoe (island – no road access)	Restore any disturbed landing point and approach path; stabilise bank erosion caused by vessel mooring	Contractor
Agboyi	Barge/canoe (floodplain – no road access)	Restore any disturbed landing point and approach path; stabilise bank erosion caused by vessel mooring	Contractor

Note: unlike the Ibeju-Lekki Axis, where all three sites have road access requiring conventional road reinstatement, only Ibereko in this axis has road access. Gberefu and Agboyi require landing-point and riverbank reinstatement instead, consistent with their barge/canoe-only access status established in Chapter 1.

3.11.3 Coastal and Mangrove Shoreline Reinstatement (Gberefu)

Site	Reinstatement Action	Responsible

Gberefu (barrier island shoreline)	Restore any disturbed shoreline; replant native mangroves (*Rhizophora racemosa*); stabilise storm-surge-exposed sections; remove invasive species	Contractor
Gberefu (fisheries habitat)	Restore fish landing areas; ensure no debris remains in the water; stabilise banks	Contractor
Gberefu (cultural heritage)	Verify no disturbance to the "Point of No Return" site or the Spirit Attenuation Well during reinstatement works; obtain traditional-authority sign-off	Contractor / CLO

3.11.4 Mangrove and Wetland Restoration (Gberefu and Agboyi)

Site	Reinstatement Action	Responsible
Gberefu (mangrove/Critical Habitat)	Restore any disturbed mangrove fringe; replant native mangrove species; remove invasive species; verify storm-surge-buffering function	Contractor
Agboyi (mangrove/riparian Critical Habitat, Maidan/Majidun River)	Restore any disturbed riparian/mangrove margin; replant native species; remove invasive species; verify flood-buffering function given the site's floodplain setting (water levels to 5 m at peak fluvial flooding)	Contractor

Both Gberefu and Agboyi are classified Likely Critical Habitat (Chapter 1, Section 1.6.3); restoration verification for both sites should be more rigorous than the standard wetland-fringe reinstatement applied elsewhere in the programme, given their Critical Habitat status.

3.11.5 Verification and Handover

- Final Inspection: PIU, LASEPA, and community representatives shall conduct a joint final inspection of all reinstated areas, including the Gberefu shoreline/mangrove margin, the Agboyi riparian margin, and both barge landing points.
- Defects Liability Period: Contractor shall remain responsible for reinstatement quality for 6 months post-completion.
- Community Sign-Off: Community leaders – specifically the Obas and Baales of Ibereko, Gberefu, and Agboyi (per the axis's established stakeholder-engagement structure), together with fisher associations and CDA representatives – shall sign off on reinstatement quality before final payment is released to the Contractor. For Agboyi, sign-off shall

additionally confirm that the two RAP-affected kiosks operator's livelihood-restoration commitments have been fulfilled.

CHAPTER 4 – DESCRIPTION OF BASELINE ENVIRONMENT

4.1 Introduction

This chapter presents the refined baseline environmental and social conditions for the three project sites within the Badagry Axis (Group 8) under the Lagos State Health Infrastructure Project (LSHIP). The baseline describes the physical, biological, and socio-economic characteristics of each site and its area of influence, based on field data collected during reconnaissance surveys (1-9 April 2026, wet season, FMEnv-approved).

Data sources include:

- Field measurements and observations during reconnaissance
- Stakeholder consultations (community entry meetings, FGDs, KIIs with the Obas, Baales, and residents of Gberefu, Agboyi, and Ibereko)
- GIS mapping and remote sensing
- Secondary datasets (Lagos State Ministry of Health, PHCB, LASEPA, NIMET, National Population Commission)

Given the multi-site, cross-jurisdictional nature of the Badagry Axis, spanning both Badagry West LCDA (Ibereko, Gberefu) and Kosofe LGA (Agboyi) baseline conditions vary across a coastal-island corridor and a riverine floodplain enclave.

This chapter is organised into:

(1) Area of Influence;

(2) Baseline Methodology;

(3) Physical Environment (by site);

(4) Biological Environment (by site);

(5) Socio-Economic and Cultural Environment (by site);

(6) Resettlement Baseline;

(7) GBV/SEA/SH Baseline;

(8) Climate Baseline.

4.1.1 Baseline Assessment Methodology

The baseline assessment for the Badagry Axis (Group 8) was conducted using a combination of primary and secondary data sources, in accordance with FMEnv guidelines, NESREA standards, and AfDB ISS (2023/2024 OS1 and OS3).

A. Field Data Collection (Primary Data)

Item	Details
Dates of Field Work	1-9 April 2026
Season	Wet Season
FMEnv Oversight	Confirmed (Field Attestation Register - Appendix 8)
Sampling Points	3 per PHC site (9 sampling points total across Ibereko, Gberefu, Agboyi)
Parameters Sampled	Air quality, noise, groundwater, soil, vegetation, socio-economic

B. Field Data Collection Methods

Parameter	Method	Equipment	Coverage
Site identification	GPS mapping	Handheld GPS	All 3 sites
Land use/land cover	Visual observation, photography	Digital camera	All 3 sites
Topography	Visual observation	N/A	All 3 sites
Flooding/erosion indicators	Visual observation	N/A	All 3 sites
Sensitive ecosystems	Visual observation, rapid ecological assessment	N/A	Gberefu, Agboyi
Asbestos screening	Visual observation	N/A	Ibereko, Gberefu
Waste management practices	Visual observation	N/A	All 3 sites
Social baseline	FGDs, KIIs, informal interviews	Structured questionnaire	All 3 sites
PAP identification	Interviews, observation	N/A	Agboyi (2 PAPs)

C. Laboratory Analysis

All environmental samples were analysed at Bato Chemical Laboratories Limited, an FMEnv-accredited laboratory (Certificate No. FMEnv/LAB/014). Analytical methods followed APHA, ASTM, WHO, and FMEnv standards. Full laboratory results and certificates of analysis are provided in Appendix 5 and Appendix 4.

D. Secondary Data Sources Reviewed

Source	Data Type	Year
NIMET	Climate data (rainfall, temperature, humidity, wind)	1990-2024
NGSA	Geological data	Various
LSMoH	Health facility data	2023-2025
PHCB	PHC functionality reports	2024
LASEPA	Environmental data	Various
AfDB	BTOR (Back-to-Office Report)	2025
National Population Commission	Population data	2006, projections
National Bureau of Statistics	Economic data	2022-2023
Nigerian Conservation Foundation	Biodiversity data	2021
UNEP	Mangrove ecosystem data	2020

E. Quality Assurance/Quality Control (QA/QC)

Field QA/QC Measures:

- Duplicate samples were collected for air, groundwater, and soil to verify consistency.
- Field blanks were used to detect contamination during sampling, handling, and transport.
- All sampling instruments (air quality monitors, probes, sound level meters) were calibrated prior to deployment.
- Samples were stored in coolers at < 6°C immediately after collection.

Laboratory QA/QC Measures:

- All analyses were conducted by an FMEnv-accredited laboratory using internationally recognized methods (APHA, ASTM, USEPA).
- Laboratory blanks, control samples, and calibration standards were run with each batch.
- Heavy metals were analyzed using AAS/ICP-OES with validated calibration curves.
- Microbiological samples were processed within 6 hours of collection to maintain integrity.
- Soil samples were air-dried, sieved (2 mm), and preserved according to FMEnv protocols.

Chain-of-Custody Integrity:

- Each sample was assigned a unique identification code.
- Chain-of-custody forms document sample collection, transfer, and laboratory receipt.
- All transfers were signed by both the field team and laboratory personnel.

Data Validation:

- Results were cross-checked against NESREA, FMEnv, WHO, and AfDB standards.
- Outliers were investigated and validated through duplicate analysis.

4.2 AREA OF INFLUENCE (AoI)

The Area of Influence is defined at three levels, in accordance with the AfDB Integrated Safeguards System (ISS, 2023/2024) and IFC Performance Standard 1 (IFC PS1). Consistent with the programme-wide standard applied across all LSHIP axes, the AoI is defined as the project site and adjoining physical surroundings (air, water, and soil quality) up to a 2 km radius from the centre of each site, together with benefiting communities located not more than 4 km away.

4.2.1 Direct Area of Influence (DAI)

The DAI includes all areas that will be directly physically altered by project activities:

Site	DAI (estimated)	Description
Ibereko PHC	800-1,200 m2	Refurbishment within existing footprint
Gberefu PHC	800-1,200 m2	Refurbishment within existing footprint
Agboyi PHC	800-1,200 m2	Refurbishment within existing footprint

Total DAI for the Badagry Axis (Group 8): Approximately 2,400-3,600 m2 (0.24-0.36 hectares)

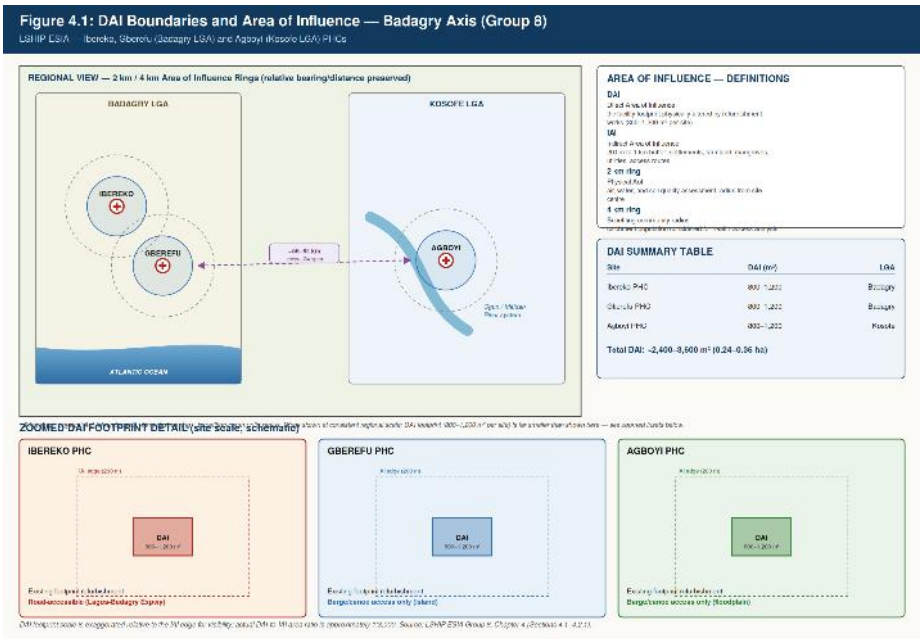


Figure 4.1: DAi Boundaries and Area of Influence

4.2.2 Indirect Area of Influence (IAI)

The IAI extends beyond the immediate physical footprint of the project (DAI) to cover the broader geographical and socio-economic zones influenced by project-induced activities, secondary developments, and cumulative pressures. This includes:

- The wider corridors within Olorunda LCDA (Ibereko), Badagry Central (Gberefu), and Agboyi-Ketu LCDA (Agboyi) that experience secondary changes in traffic, resource use, or economic activity.
- Regional transportation and logistics networks, specifically waterway-traffic and navigation corridors along the Badagry Creek and Ogun/Maidan River systems supporting Gberefu and Agboyi, and expressway-traffic and haulage corridors along the Lagos–Badagry Expressway supporting Ibereko.

- Wider hydromorphological, mangrove, and wetland systems susceptible to cumulative runoff, sedimentation, or regional hydrological shifts from surrounding urban and rural activities (further detailed under the Cumulative Influence Zone in Section 4.2.3).

Table 4.1 – Comparative Baseline Analysis of PHC Catchment Communities

Parameter	Ibereko	Gberefu	Agboyi
Location Context	Coastal/lagoon-side settlement on the Lagos-Badagry Expressway	Barrier island between Badagry Lagoon and the Atlantic Ocean	Riverine floodplain enclave (Agboyi I, II, III) between the Ogun and Maidan Rivers
LGA / LCDA	Olorunda LCDA, Badagry West LCDA	Badagry Central, Badagry LGA	Agboyi-Ketu LCDA, Kosofe LGA
Settlement Type	Coastal/peri-urban, expressway-adjacent	Island (barrier island)	Riverine floodplain enclave
Dominant Ethnic Group	Yoruba (Egun/Ilaje presence, consistent with the Badagry coastal corridor)	Yoruba (Egun/Ilaje presence)	Yoruba
Main Livelihoods	Trading, transport-related commerce (expressway gateway)	Fishing	Fishing, farming
Key Structural Issue	Distressed structure; wall cracks; rising damp	Dilapidation; facility overtaken by bats and thickets	Extreme fluvial flooding (up to 5 m); no motorable road access
Clinical Impact of Deficiency	Foundation-failure risk; unsterile consultation rooms	Total loss of 24/7 emergency capacity for the ~16,000-resident catchment	Seasonal isolation; waterborne-illness epidemics; emergency cases delayed awaiting canoe transport

Road Condition	Fair access (Lagos-Badagry Expressway)	No road access – barge/canoe only	No road access – barge/canoe only ("Agboyi I, II, III" residents rely on wooden canoes)
Water Supply Source	Boreholes	Boreholes; river used as both water source and waste receptor	Boreholes (frequently E. coli-contaminated from proximity to makeshift wooden latrines); river used as both water source and waste receptor
Environmental Setting	Saline-rich coastal atmosphere	Barrier island; storm-surge exposure; mangrove-proximate	Riparian floodplain; mangrove/riparian Critical Habitat
Key Environmental Issue	Rising damp; saline-rich atmosphere accelerating structural decay	Coastal erosion; storm surge; biological hazards (mold, bats, reptiles)	Extreme fluvial flooding; drowning/waterborne-disease risk during canoe navigation
Traditional Leadership	Baale-led	Baale-led	Baale-led

4.2.3 Cumulative Influence Zone (CIZ)

Based on the environmental and structural mapping for the LSHIP Badagry Axis (Group 8), the Cumulative Influence Zone represents the overlapping area where localised project footprints interact with larger regional and environmental systems.

Key characteristics of this zone include:

- **Cross-Jurisdictional and Terrestrial-Riverine Overlap:** The CIZ encompasses the immediate host communities surrounding Ibereko and Gberefu (Badagry LGA) together with the Agboyi I, II, and III enclaves (Kosofe LGA), extending across two separate administrative and hydrological systems the Badagry Lagoon/Atlantic coastal corridor and the Ogun/Maidan riverine floodplain.

- **Environmental Sensitivities:** The axis features site-specific conditions, a saline-rich coastal atmosphere and storm-surge exposure at Gberefu, and extreme fluvial dynamics (water levels to 5 m) at Agboyi, such that the influence zone must account for how construction run-off, barge/canoe wake, and storm surge interact with the Badagry Lagoon, the Atlantic shoreline, and the Ogun/Maidan River system respectively.
- **Socio-Economic Footprint:** The CIZ covers the spatial boundaries where local supply chains, waterborne haulage networks (barge and canoe transport to Gberefu and Agboyi), and community employment targets, drawing from both Badagry LGA and Kosofe LGA labour pools under the axis's "Zero-Camp" workforce policy converge to alter the regional baseline economy.

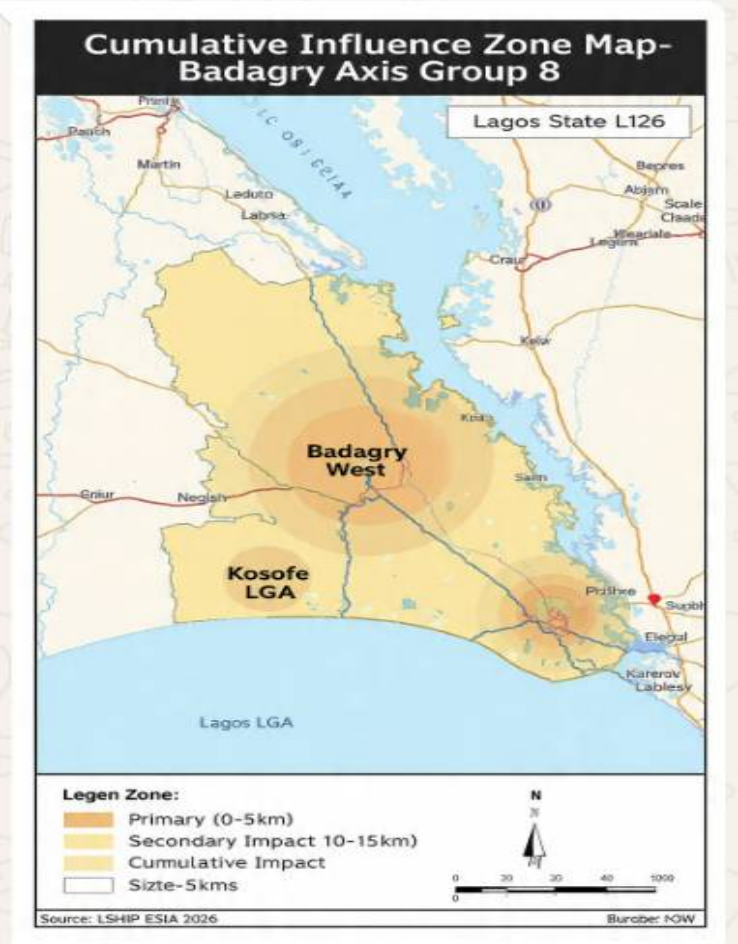


Figure 4.2: Cumulative Influence Zone map

4.3 Study Approach and Methodology

In order to effectively characterize the bio-physical environment of the study area, a wet season field data gathering exercise was approved by Federal Ministry of Environment. A review of the existing baseline information from the past similar studies was carried out. This is with a view to understanding the existing environmental and social conditions of the project's sites. The field work was carried out from the 1st April to 9th April 2026.

Samples were collected from different sampling points taking into cognizance the distribution of the project components, existing ecological features, and the geographical locations of the communities. The coordinates of each of the sampling points were recorded using Global Positioning System (GPS) as shown inbelow

Table 4.2: Sampling points

Ibereko PHC						
Sampling Points	Groundwater	Surface Water	Soil	Air & Noise	**Coordinates**	
SP 1	6.441703, 2.919342	6.441703, 2.919342	6.441703, 2.919342	6.441703, 2.919342	6.441703	**2.919342**
SP 2	6.442074, 2.919713	6.442074, 2.919713	6.441909, 2.919621	6.441909, 2.919621	6.441909	**2.919621**
SP 3	X	–	6.442074, 2.919713	6.442074, 2.919713	6.442074	**2.919713**
Gberefu PHC						
SP 1	6.397317, 2.873419	6.397317, 2.873419	6.397317, 2.873419	6.397317, 2.873419	6.397317	**2.873419**
SP 2	6.397800, 2.873510	6.397800, 2.873510	6.396999, 2.873367	6.396999, 2.873367	6.396999	**2.873367**
SP 3	X	–	6.397800,	6.397800, 2.873510	6.397800	**2.87351**

			2.873510			
Agboyi PHC						
SP 1	6.578345, 3.409531	6.578345, 3.409531	6.578345, 3.409531	6.578345, 3.409531	6.578345	**3.409531**
SP 2	6.578068, 3.409695	6.578068, 3.409695	6.578414, 3.409647	6.578414, 3.409647	6.578414	**3.409647**
SP 3	**X**	–	**6.578068, 3.409695**	**6.578068, 3.409695**	**6.578068**	**3.409695**

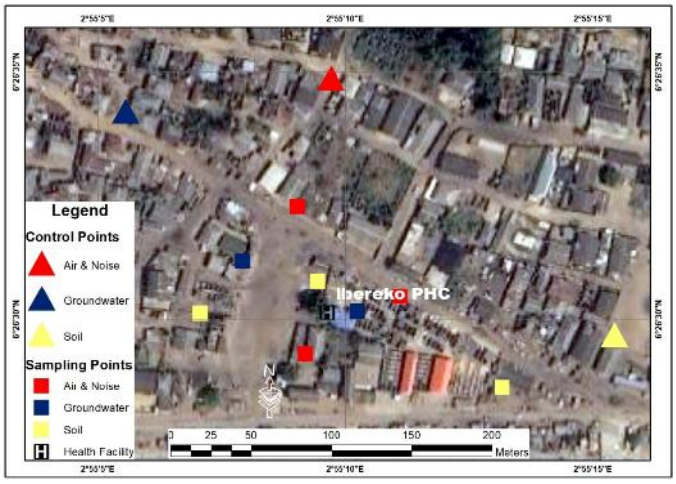


Figure 4.3a Ibereko PHC sampling map

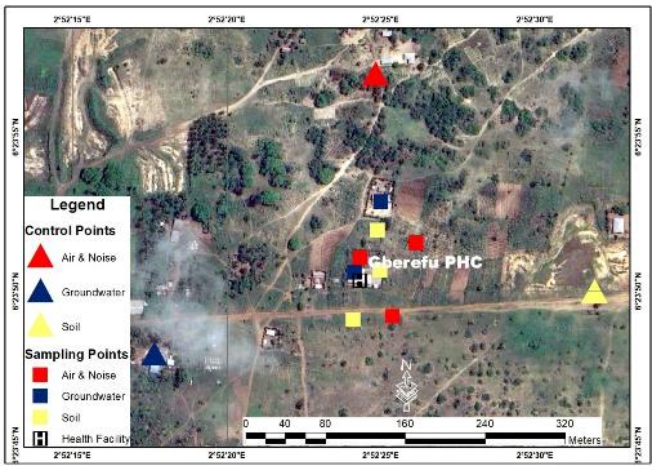


Figure 4.3b: Gberefu PHC Sampling Map

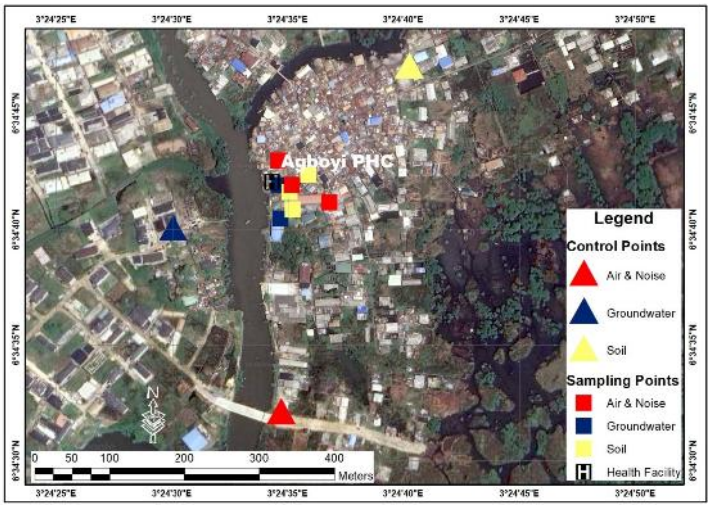


Figure 4.3c: Agboyi PHc Sampling Map

The specific objectives of the field work were to:

- Determine the ambient air quality and noise level characteristics of the study area;
- Determine the physio-chemical and microbiological characteristics of the soil within the study area;

- Determine the physico-chemical and microbiological characteristics of water resources of the study area;
- Determine the vegetation characteristics of the area; and
- Establish the socio-economic and health baseline of the project area.

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4.3.1 Soils Sampling

Surface soil was investigated through visual observation and sampling. Composite soil samples were obtained from three designated sampling points in each location of the project sites. Hand soil Auger of uniform cross section was used to ensure that reproducible composite soil samples were collected from depths of 0-15cm and 15-30cm. This ensured high quality representative data collection.

Soil samples were collected in polythene bags that were then appropriately labeled and sealed. Samples for microbiological analysis were collected in sterile McCarthey bottles and kept under 4^0C in a refrigerated container (cooler). Samples for physico-chemical analysis were air-dried in a dust-free environment while those for microbiological analysis were stored in ice-packed container in the field and later transferred to the refrigerator at 4^0C. Physico-chemical analysis of soil samples were carried out using the analytical methods recommended by FMENV.



Plate: 4.1: Sample collection sites

4.3.2 Water Quality and Hydro-biological Studies

In-situ measurements for pH, temperature, conductivity and dissolved oxygen were conducted with Pye Unicam meter on groundwater samples from a wells and borehole on the project site. For other physiochemical analysis, duplicate water samples were collected from the wells and borehole in 1-litre plastic containers, labeled and stored in an insulated refrigerated container and later analyzed in the laboratory according to Lind (1979) and APHA (1985).

All samples for laboratory analysis were transported from the project site to Bato Chemical Laboratories Limited for analysis within 24hours. The Laboratory is approved by the Federal Ministry of Environment, Abuja.



Figure: 4.4: Insitu Water Quality PH Meter

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4.3.3 Microbiological Studies

Groundwater samples were collected from the well in the project site and were collected in 100ml plastic containers and kept in ice-cool container prior to culturing in the laboratory and sent for microbiological studies. The water was then analyzed for coliforms using the multiple tube fermentation technique in the Bato Chemical Laboratories Limited, EC broth was the medium used and MPN Index was determined with MPN Table. The heterotrophic count was determined using the Plate Count Agar upon which aliquots of 0.5ml of serially diluted samples were plated.

4.3.4 Air Quality and Noise Level Studies

The air pollutants that are of greatest concern to the proposed project are Sulphur Oxides (SOx), Nitrogen Oxides (NOx), Particulate Matter (PM), Hydrocarbon (HC) gases, Volatile Organic Compounds (VOCs), Carbondioxide and Carbon Monoxide (CO). Air quality and noise level characteristics were monitored in three (3) points on the project site.

4.3.5 Chain of Custody Management

All samples collected on site were recorded in a field notebook or field log. Inventory of samples collected and all necessary information including parameters to analyse, type of sample, date of sampling, etc were recorded in the chain of custody form.

4.3.6 Quality Assurance/ Quality Control

In order to ensure the integrity of collected samples, the following measures were taken to avoid cross contamination, deterioration and pollution of samples from the point of collection on the site till the collation of the laboratory results.

- Ensuring that only experienced and qualified personnel are engaged in the study;
- Ensuring proper sampling in precleaned sampling containers and after sampling proper labelling by capturing sample ID, location and date.
- Carrying out field calibrations of equipment and running distilled water blanks to reduce errors that could arise from field measurements;
- Ensuring that replicate samples are collected and used as checks on measurements; Carrying out field analytical operations in a defined sequence to avoid cross contamination of instruments.
- Collected samples were submitted on time to an FMEnv approved laboratories, which are well equipped with latest sophisticated instruments and managed by well experienced professionals.

4.3.7 Analytical Methods

Samples collected from the field were analyzed in Bato Chemical Laboratories Limited. The methods presented in Table 4.3 were employed in the samples analyses**.** Also shown on the table are the equipment detection limits for the different parameters analyzed.

Table 4. 3: Sample analysis methods used

Parameters for Water	**Methods**
Temperature (oC)	APHA 2110B
pH	APHA 4500H+B
Turbidity (NTU)	APHA 2130B
Salinity (mg/l)	APHA 2520B
TSS (mg/l)	APHA 2540D
TDS (mg/l)	APHA 2510A
Conductivity (µS/cm)	APHA 2510A
THC (mg/l)	ASTM D3921
DO (mg/l)	APHA 4500-O G
BOD (mg/l)	APHA 5210A
COD (mg/l)	APHA 5220D
Reactive Silica (mg/l)	APHA 4500-SiO2
Nitrate (mg/l)	EPA 352.1
Phosphate (mg/l)	APHA4500-P D
Ammonium (mg/l)	APHA 4500-NH3
Calcium (mg/l)	APHA 3111B/ASTM D3561
Magnesium (mg/l)	APHA 3111B/ASTM D3561
Potassium (mg/l)	APHA 3111B/ASTM D3561
Sodium (mg/l)	APHA 3111B/ASTM D3561

4.3.8 Laboratory Analysis Status and QA/QC Procedures

All environmental samples collected during the field surveys (1-9 April 2026) were analysed at Bato Chemical Laboratories Limited, an FMEnv-accredited laboratory (Certificate No. FMEnv/LAB/014). The complete laboratory documentation, including chain-of-custody forms

Appendix 3, analytical plot-outs, calibration certificates, and attestation forms, is provided in Appendix 10.

The laboratory analysis results confirm that all baseline environmental data presented in Chapter 4 (Sections 4.3.1-4.3.5) are derived from samples collected and analysed in accordance with FMEnv guidelines, NESREA standards, and AfDB ISS (2023/2024 OS1 and OS3). The QA/QC procedures documented in Appendix 12 ensure the accuracy, reliability, and traceability of all baseline data.

4.4 Description of Bio-Geophysical Environment

4.4.1 Climate and Meteorology

Lagos is located at Latitude 6.4°N and Longitude 3.4°E lying on an average elevation of 15m asl, a tropical climate with distinct dry and wet seasons classified according to Köppen climate classification. Lagos has a short dry season between November and February with a lengthy wet season which runs from March through October. The climate of Lagos is predominantly influenced by its situation adjacent to the Atlantic Ocean with susceptibility to prevailing maritime weather conditions.

The Lagos lagoon which also has huge hydrological effects on the regional climate is the largest of the three Lagoon systems occurring in the Lagos area, receiving over 80% of the land- derived run-offs laden with various types of wastes. It lies within longitudes 6°25" and 6°43" and latitudes 3°22" and 3°40". During the rainy season, the lagoon is fed by the numerous coastal rivers draining into it while during the dry season, the loss of water due to evaporation and the reduced amount of water from the rivers and creeks is compensated for by the underground seepage under the active sandy barrier formation and inflow of the tidal waters from the sea through the Lagos harbor and other lagoon outlets.

Climate Change Considerations and Flood Risk Implications

(Aligned with Nigeria Climate Change Act, 2021)

In accordance with the Nigeria Climate Change Act (2021), climate change is recognized as a cross-cutting risk with implications for environmental sustainability, infrastructure resilience, public safety, and socio-economic development. The Act mandates the integration of climate change adaptation and resilience measures into policies, plans, and development projects, particularly in climate-vulnerable regions such as coastal and low-lying states.

Lagos State is highly vulnerable to the impacts of climate change due to its:

- Low elevation and extensive coastal interface
- High population density and rapid urbanization
- Dependence on lagoon and coastal systems for drainage

Observed and projected climate trends for the region indicate:

- Increasing rainfall intensity and variability
- Rising sea levels and tidal influence
- Greater frequency of extreme rainfall and flood events

These changes exacerbate existing flood risks by overwhelming drainage infrastructure, increasing surface runoff, and promoting tidal backflow from lagoons and coastal waters. Flooding has direct implications for environmental quality, public health, housing, transportation networks, and economic activities, while also increasing the risk of secondary pollution from waste sites, septic systems, and contaminated floodwaters.

Consistent with the Nigeria Climate Change Act, development activities within Lagos State are therefore required to incorporate climate-responsive planning, including flood risk assessment, adaptive drainage design, and measures to enhance long-term environmental resilience.

Climate Variability and Flood Susceptibility in Low-Lying LGAs

Several Local Government Areas (LGAs) in Lagos State are inherently low-lying and flood-prone, making them particularly sensitive to climate variability and extreme weather events. Climate variability in these areas is expressed through erratic rainfall patterns, prolonged wet spells, and increased tidal influence during storm events.

Flood susceptibility in these LGAs is influenced by:

- Proximity to the Atlantic Ocean, lagoons, and river systems
- Reclaimed land and limited natural drainage gradients
- High levels of impervious surfaces due to urban development
- Encroachment on wetlands and floodplains

These conditions align with the Nigeria Climate Change Act's emphasis on identifying climate-vulnerable zones and prioritizing adaptation measures to reduce exposure and sensitivity to climate-induced hazards.

Table 3.1: Average Weather Trend for Lagos State (1985-2024)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Record High °C	37.0	39.0	36.0	35.0	34.0	33.0	31.0	30.0	31.0	36.0	33.0	37.0
Average High °C	33.17	32.49	32.34	32.36	31.62	29.77	28.27	27.84	28.69	31.62	30.16	32.96
Daily Mean °C	29.69	29.8	30.09	30.19	29.63	27.99	26.62	26.13	26.84	29.29	28.09	29.7
Average Low °C	25.61	26.65	27.34	27.47	27.11	25.75	24.57	24.01	24.6	26.52	25.59	25.9
Record Low °C	21.0	24.0	25.0	24.0	21.0	18.0	20.0	21.0	19.0	24.0	20.0	22.0
Average Precipitation mm (inches)	33.29	55.21	53.45	47.96	110.55	276.96	244.25	175.91	283.21	107.32	154.09	41.91
Average precipitation days (≥ 1.0 mm)	7.0	11.45	12.73	10.36	17.09	21.82	23.82	17.45	24.45	19.82	17.73	9.91
Average Relative Humidity (%)	67.91	73.9	74.84	74.35	75.67	78.74	81.06	81.83	81.63	76.51	79.05	68.71
Mean Monthly Sunshine Hours	11.17	10.82	10.83	11.05	10.78	9.96	9.03	8.75	9.45	10.69	10.45	10.84

Source: Nimet, Lagos Station, Ikeja

4.4.1.1 Rainfall

Lagos has 2 rainfall peaks in May and June, as shown in the table and charts and its Lagos experiences rainfall throughout the year. Data spanning 37 years (1986-2023) indicates June with the highest rainfall (283.21mm) and January with the lowest (typically a dry season month). The average rainfall over this period is 135.76mm, representing the expected pattern, as illustrated in Table 3.1 and Figure 4.5. Furthermore, 30 years of hourly weather model simulations and observed historical climate and weather data, confirm the period of the wet and dry season in the project areas.

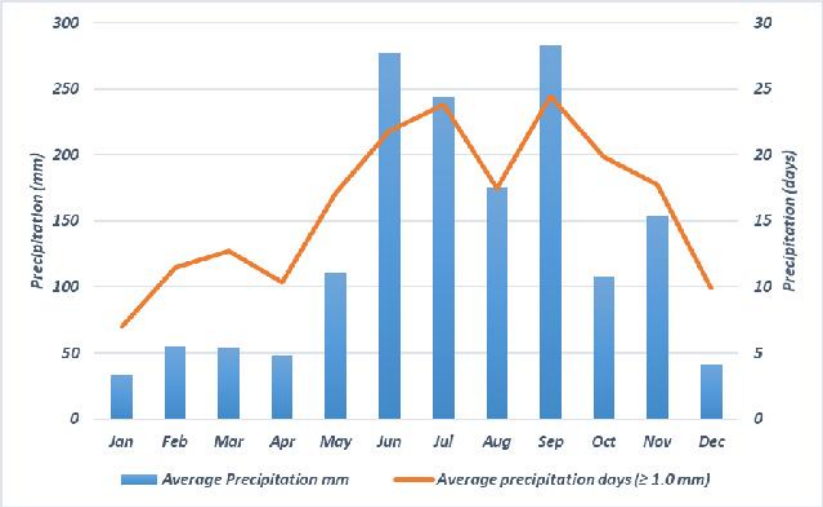


Figure 4,5: Rainfall Pattern in the Study Area

Source: Nimet

4.4.1.2 Temperature

Temperature is a dominant climate factor that varies from place to place over a period of time at given locations. The spatial distribution of temperature over the earth is influenced by; amount of insulation received, nature of surface, distance from water bodies, relief, nature of the prevailing winds and ocean current.

Temperatures are usually high and vary little year-round which is typical of the equatorial belt. The data collected for a period of 37 years from 1985 to 2024 for Lagos State showed an average maximum temperature of 30.87°C and an average minimum temperature of 25.9°C. Figure 4.6

shows the average warmest temperature in Lagos is recorded in February and March, while the lowest is in June

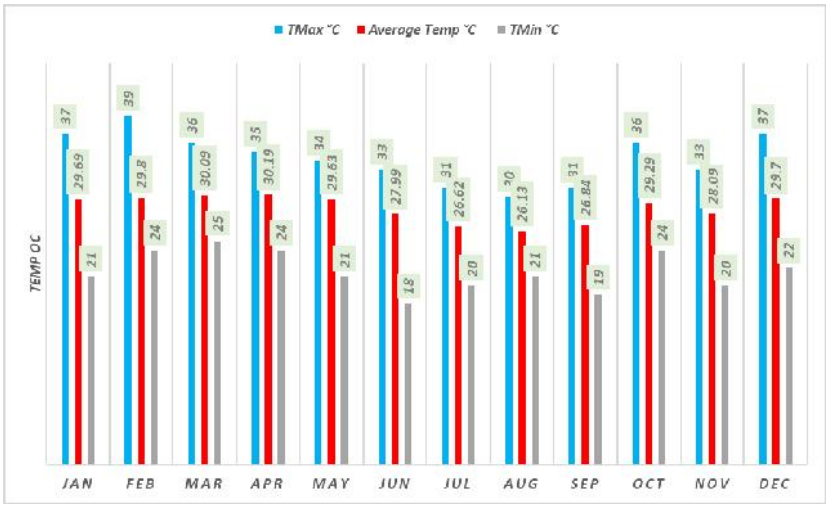


Figure 4.6: Average Temperature in the Study Area

Source: Nimet

4.4.1.3 Wind Speed and Direction

Surface wind speed is 0.5 – 7.7 m/s with an average of 3.6 m/s (Table 4.4) and prevailing southwest direction (Figure 4.7). The measured wind speed of 0.8 –1.7 m/s during the dry season fieldwork with northeast prevailing direction and 3.1 – 3.9 m/s with south-southwest prevailing direction in the dry season (Figure 4.7) also agree with the climatic data with south-southwest prevailing direction in the wet season (Figure 4.7) also agree with the climatic data. If the air is calm, pollutants cannot disperse, and then the concentration of these pollutants will build up. On the other hand, when strong, turbulent winds blow, pollutants disperse quickly, resulting in lower pollutant concentrations. In pollution, meteorology calms are associated with inversions (temperature increasing with height). Inversion may result in fumigation; meaning that emissions are trapped at ground level close to their source as against other situations where it is dispersed and diluted much more easily. Inversion is widely known to be frequent during the early hours of the day. A 30-year mean macro data shows that wind speed over the study environment is generally minimal and this signifies a low to moderate dispersive potential of the local atmosphere.

Table 4.4: Monthly Wind Data of Lagos State (1988-2024)

YEAR	Speed	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	Direction												
1988	Speed	6.1	7.1	8.7	7.6	6.4	6	7.7	8.7	7.4	5.7	5.8	5.9
	Direction	N	W	S	S	W	W	W	W	W	W	S	W
1989	Speed	6	8	8.6	7.6	6.5	6.9	8	9.7	2.5	5.9	5.1	5.5
	Direction	N	W	S	W	S	S	SW	W	W	SW	S	SW
1990	Speed	5.9	8.2	8.5	8.6	7.1	6.5	8.4	10.3	8.2	5.4	5.5	5.1
	Direction	N	S	S	S	SW	SW	SW	SW	SW	S	S	W
1991	Speed	7.2	8.7	8.4	9	6.1	5.9	8.7	9.7	8	5.5	4.1	5
	Direction	N	S	S	SW	SW	S	W	W	W	W	W	SW
1992	Speed	4.4	8.7	9	9.8	6.8	7.7	9.8	10.5	7.6	5.7	5.9	5
	Direction	SW	SW	W	SW	SW	SW	W	W	SW	W	SW	SW
1993	Speed	5.6	6.9	9.3	8.1	6.4	5.9	5.1	6.7	4.8	4.2	3.9	3.8
	Direction	S	S	S	S	S	S	S	SW	S	S	NW	NW
1994	Speed	3.2	1.6	5.9	4.5	2.9	3.7	3.9	4.2	3.9	3.4	4.2	3.2
	Direction	NE	E	W	SW	SW	SW	SW	SW	SW	SW	W	NE
1995	Speed	2	2.9	3.2	3	2.8	2.9	3.2	3.4	3.3	3.1	2.9	2
	Direction	W	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	W
1996	Speed	2.5	3	3.3	3.4	2.8	2.6	5.9	3.3	4.8	3.2	2.8	2.5
	Direction	SW	S	SW	S	SW	SW	SW	SW	W	S	SW	SW
1997	Speed	2.6	3.4	3.6	3.2	3	2.8	2.9	3.7	3.1	2.5	2.4	2.6

	Direction	N	W	S	S	W	W	W	W	W	W	S	N
1998	Speed	3.1	2.9	3.3	3.7	3.3	3	3.1	2.7	3.1	2.2	2.5	3.1
	Direction	W	W	S	S	S	S	W	W	W	W	W	W
1999	Speed	2.4	3	3.5	3.4	2.8	3.2	3.1	3.3	3.2	2.8	2.5	2.4
	Direction	W	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	W
2000	Speed	2.4	3.5	3.8	3.6	2.3	2.6	3.9	4	2.7	2.8	1.9	1.6
	Direction	S	S	S	S	S	S	S	SW	S	S	NW	NW
2001	Speed	2.2	3.4	4.6	4.2	2.5	3.1	4.2	4.2	3.7	3.4	2.7	3.5
	Direction	N	W	S	S	W	W	W	W	W	W	S	W
2002	Speed	4.6	3.6	4.5	4.3	4	3.9	4.7	5.4	3.5	3.9	2.6	3.5
	Direction	W	W	S	S	S	S	W	W	W	W	W	SW
2003	Speed	4.2	5.3	6.3	5.9	4.3	5.2	4.2	5.4	5.8	4	3.6	3.8
	Direction	W	S	S	S	S	S	W	W	SW	S	S	SW
2004	Speed	4.5	5.5	5.7	5.3	4.9	4.8	5.8	5.5	5.3	4.5	3.9	3.9
	Direction	W	S	S	W	S	W	S	SW	W	SW	S	SW
2005	Speed	4.5	5.3	5.4	5.1	4.7	4.6	5.1	5	5.2	4.1	3.7	3.8
	Direction	S	W	W	S	S	S	W	S	SW	S	SW	W
2006	Speed	4.4	4.7	5.1	4.8	4.5	4	6.2	5.1	3.9	3.1	3.1	3.1
	Direction	S	S	S	S	S	SW	SW	S	S	S	W	W
2007	Speed	4.3	4.9	5	5.2	4.2	3.9	5.1	5.9	5.1	3.8	3.9	3.7
	Direction	S	S	S	S	S	S	S	SW	S	S	NW	NW
2008	Speed	4.6	4.3	5.6	5.6	4.1	6.8	6.1	5.2	7.5	5.6	3.5	5.1

	Direction	N	W	S	S	W	W	W	W	W	W	S	W
2009	Speed	6.1	4.2	7.8	7.6	6.3	5.9	7.1	7.3	6.3	5.8	5.3	5.8
	Direction	W	W	S	S	S	S	W	W	W	W	W	SW
2010	Speed	6.1	7.1	8.7	7.6	6.4	6	7.7	8.7	7.4	5.7	5.8	5.9
	Direction	W	S	S	S	S	S	W	W	SW	S	S	SW
2011	Speed	6	8	8.6	7.6	6.5	6.9	8	9.7	2.5	5.9	5.1	5.5
	Direction	W	S	S	W	S	W	S	SW	W	SW	S	SW
2012	Speed	6.1	7.1	8.7	7.6	6.4	6	7.7	8.7	7.4	5.7	5.8	5.9
	Direction	N	W	S	S	W	W	W	W	W	W	S	W
2013	Speed	6	8	8.6	7.6	6.5	6.9	8	9.7	2.5	5.9	5.1	5.5
	Direction	N	W	S	W	S	S	SW	W	W	SW	S	SW
2014	Speed	5.9	8.2	8.5	8.6	7.1	6.5	8.4	10.3	8.2	5.4	5.5	5.1
	Direction	N	S	S	S	SW	SW	SW	SW	SW	S	S	W
2015	Speed	7.2	8.7	8.4	9	6.1	5.9	8.7	9.7	8	5.5	4.1	5
	Direction	N	S	S	SW	SW	S	W	W	W	W	W	SW
2016	Speed	4.4	8.7	9	9.8	6.8	7.7	9.8	10.5	7.6	5.7	5.9	5
	Direction	SW	SW	W	SW	SW	SW	W	W	SW	W	SW	SW
2017	Speed	5.6	6.9	9.3	8.1	6.4	5.9	5.1	6.7	4.8	4.2	3.9	3.8
	Direction	S	S	S	S	S	SW	SW	S	S	S	W	W
2018	Speed	5.8	8	8.8	9.1	7.4	5.3	6.5	8.2	6.1	5.1	5.7	5
	Direction	S	S	S	S	S	S	S	SW	S	S	NW	NW
2019	Speed	5.5	6.4	7.1	6.7	5.7	6.1	5.9	5.9	5.9	5.8	5.7	4.7

	Direction	N	W	S	S	W	W	W	W	W	W	S	W
2020	Speed	5.1	4.8	5.2	5.5	4	0.4	6.1	9.5	4.2	3.1	1.2	5.1
	Direction	SW	S	SW	S	S	S	W	W	SW	SW	SW	S
2021	Speed	3.5	3.5	3.1	3.5	2.3	3.4	3.2	2.9	2.7	2.9	2.4	2.9
	Direction	W	W	SW	SW	SW	SW	SW	SW	SW	SW	W	S
2022	Speed	2.3	2.6	2.6	2.5	2.3	2.2	3	3.2	2.4	2.2	2.6	3.2
	Direction	N	E	W	SW	SW	SW	SW	SW	SW	SW	W	W

Source: NiMet

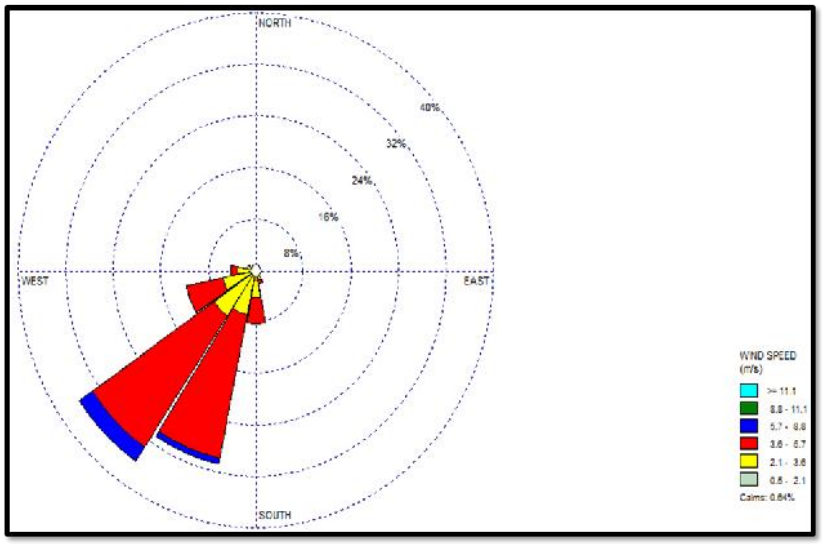


Figure 4.7: Prevailing Wind Direction in the Proposed Project Area

4.4.1.4 Relative Humidity

This is an indication of the water vapour content in the atmosphere. High relative humidity is indicative of moist conditions while low relative humidity suggests drier conditions. There is a marked diurnal variation in the relative humidity pattern of this area. It has an indirect relationship with temperature changes. The humidity is comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Relative humidity, linked to air temperature, influences cloud formation and precipitation types. A 37-year data span (1985-2024) shows average yearly humidity at 75.99%, varying from 67.1% in January to 81.83% in July Throughout 1985-2024, Lagos consistently maintains relative humidity above 60% monthly, irrespective of season. June and July peak at 81.01% and 81.83% respectively, correlating with the rainy season. High humidity, typical during the wet season, results from Lagos' location and near-constant rainfall. Peaks reach 81.63% from June to September, with January's low at 67.91%.

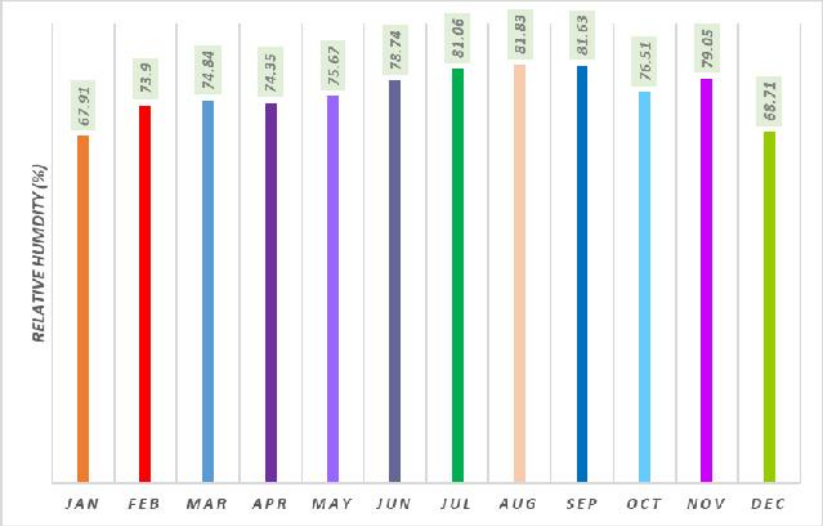


Figure 3.116: Average Relative Humidity in the Study Area

Source: Nimet

4.4.1.5 Sunshine Hours

Hours of daylight and darkness hardly vary for more than one hour during any period of the year because of the latitudinal location of the region. The annual sunshine period in the study area is about 1500 hours with monthly period of 51.2 – 165.7 hrs It receives the minimum period in July - September but the maximum in December - January. The short period in July could be due to the greater cloudiness and rainfall characteristic of the period. Conversely, the higher December sunshine period is due to the prevalent clear skies accompanying the ITCZ movement in its northward migration. The longest monthly sunshine hours occur in December/January in the dry season while July usually experiences the lowest values of sunshine hours. This can be attributed to constant cloudiness from rain clouds in the wettest months. Sunshine hours are directly proportional to the net radiation. Net radiation and air temperature are highest during the dry season except when relatively cold harmattan winds occur.

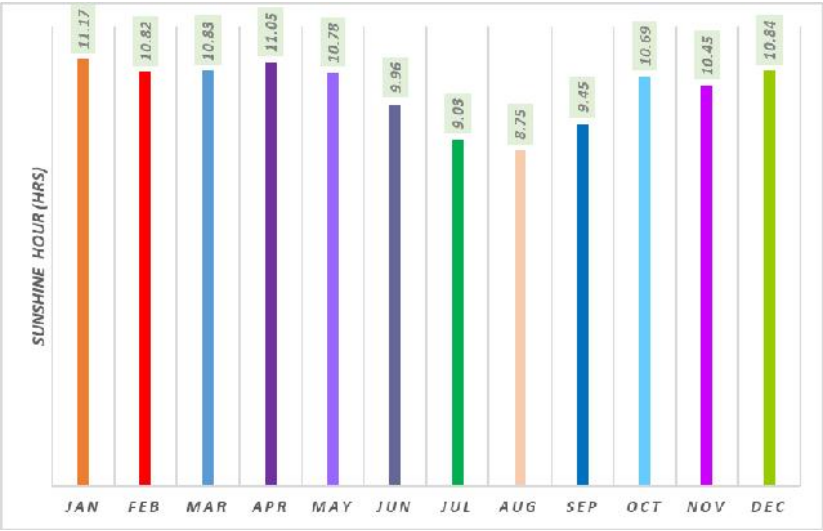


Figure 4.8: Monthly Average Sunshine Hours in the Study Area

Source: Nimet

4.4.1.6 Cloud Cover Categories

In the project areas, cloud cover is generally high throughout the year with very little variations. It is higher in May and October and lowest in June and July with average of 6.7 – 6.9 Oktas indicating overcast sky with blue patches.

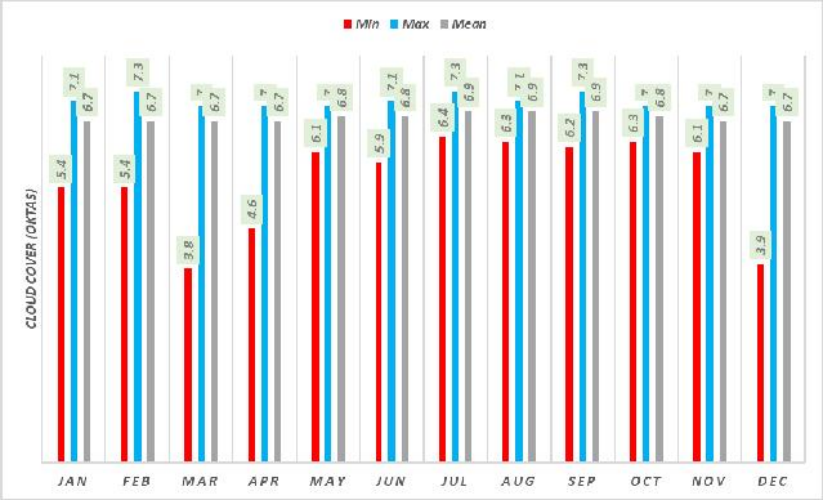


Figure 4.9: Cloud Cover in the Study Area

Source: Nimet

4.4.1.7 Atmospheric Pressure

The mean atmospheric pressure from the climatic data is 1015 – 1020 mbar with the minimum and maximum in January and June respectively. During the fieldwork, atmospheric pressure was measured to be 1007.1 – 1019.4 mbar in the dry season but 1011.1 – 1013.6 mbar in the dry season. These are also within the climatic data. Air pressure differences across various locations are the results of unequal heating across surfaces. This leads to wind blowing from high pressure areas towards low pressure areas. High pressure areas are usually associated with clear weather while low pressure areas are associated with unstable weather conditions which generate precipitation.

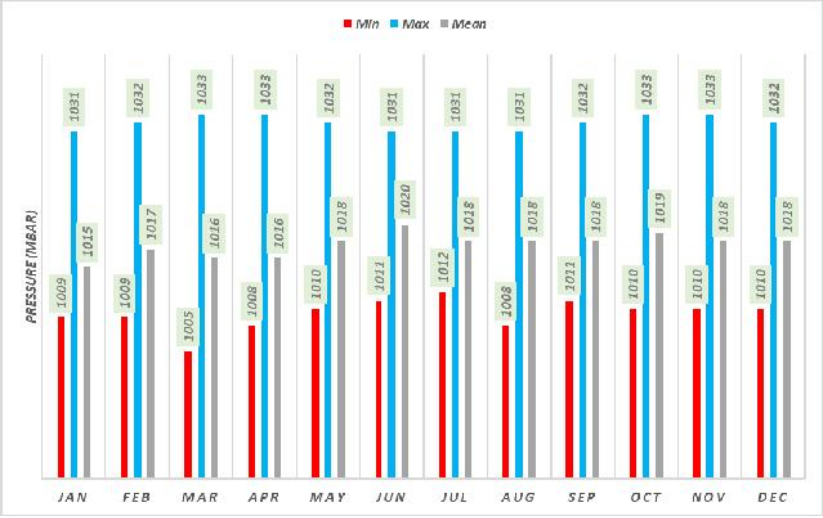


Figure 4.10: Average Pressure in the Study Area

Source: Nimet

4.4.2 Geology and geomorphology of Lagos State

Lagos State is underlain by the Benin Formation (Coastal Plain Sands) of Miocene to Recent age, a sequence of unconsolidated, highly permeable quartz sands with interbedded clay lenses. The surface geology is dominated by these sands, with recent littoral and alluvial deposits along the coastline, lagoons, and creeks.

Geomorphologically, Lagos is a low-lying coastal state with elevations ranging from 0 to 50 metres above sea level, characterized by continental sands on the mainland, littoral swamps and mangrove forests, extensive lagoons and creeks, and sandy barrier islands.

Hydrogeologically, Lagos hosts a multi-layered aquifer system with at least four major horizons. The second aquifer, at depths of 20 to 100 metres below sea level, provides over 75 percent of groundwater for domestic and industrial use, notably in the Ikeja and Ojota axis. Deeper aquifers offer excellent water quality but are vulnerable to saltwater up-coning if over-pumped.

4.4.2.1 Geology and geomorphology of Ibereko, Gberefu and Agboyi LGA

Location (PHC / LGA)	Geology	Geomorphology	Key Notes

Ibereko PHC (Badagry LGA)	Predominantly coastal plain sands with interbedded clay and lagoonal deposits, influenced by marine and fluvial sedimentation processes.	Low-lying coastal terrain characterized by sandy barriers, tidal flats, and wetland zones influenced by lagoonal and marine dynamics.	Highly vulnerable to coastal flooding, erosion, and saline intrusion due to proximity to the Atlantic coastline and Badagry Creek. Soils are generally well-drained but weakly consolidated.
Gberefu PHC (Badagry LGA)	Recent alluvial and coastal deposits consisting of sand, silt, and clay, typical of a barrier-lagoon coastal system.	Narrow coastal strip with barrier ridges, lagoon backwaters, and flat, unstable terrain strongly shaped by ocean–lagoon interaction.	Extremely vulnerable to coastal erosion, storm surges, and flooding. The area forms part of the active barrier coastline separating the Atlantic Ocean from inland lagoon systems.
Agboyi PHC (Kosofe LGA)	Coastal plain sands with localized clay lenses and fluvio-lagoonal sediment deposits.	Low-lying floodplain terrain adjacent to Lagos Lagoon with extensive wetlands and swampy areas.	High flood susceptibility due to lagoon proximity, shallow groundwater table, and poor drainage conditions. Urban expansion is increasing pressure on wetland areas.

4.4.2.2 Hydrology and Drainage of Ibereko, Gberefu and Agboyi LGA

Location (PHC / LGA)	**Hydrology**	**Drainage Characteristics**	**Key Notes**
Ibereko PHC (Badagry LGA)	Strongly influenced by rainfall patterns and proximity to coastal and lagoonal water bodies.	Generally moderate natural infiltration due to sandy soils; limited engineered drainage infrastructure.	Moderate drainage efficiency, but localized flooding occurs during intense rainfall events,

			especially in low-lying zones.
Gberefu PHC (Badagry LGA)	Dominated by coastal and lagoonal hydrological systems with seasonal rainfall influence.	Poor natural drainage due to flat terrain, high groundwater table, and tidal influence restricting runoff.	High flood vulnerability; frequent waterlogging conditions during rainy seasons requiring improved drainage intervention.
Agboyi PHC (Kosofe LGA)	Rainfall-driven hydrology with strong influence from Lagos Lagoon backwater effects.	Mixed natural and semi-engineered drainage systems, though largely constrained by wetlands and poor soil permeability.	High flood risk due to lagoon proximity, wetland encroachment, and increasing urban runoff from surrounding developments.

4.5 Ambient Air Quality and Noise Level

This section presents the baseline air quality and noise monitoring results conducted at Three (3) Primary Health Center (PHC) locations within Lagos State. The assessment establishes pre-project or existing environmental conditions against which future impacts will be evaluated. Monitoring was conducted in accordance with the Federal Ministry of Environment (FMEnv) Guidelines, National Environmental Standards and Regulations Enforcement Agency (NESREA) Regulations, and the International Finance Corporation (IFC) Environmental, Health, and Safety (EHS) Guidelines.

Ambient air quality and noise measurements were conducted at selected Primary Health Care (PHC) facilities in Lagos State. Parameters measured included Relative Humidity (RH%), PM2.5, PM10, CO_2, Temperature, Formaldehyde (HCHO), Air Quality Index (AQI), Noise, and Total Volatile Organic Compounds (TVOC). Results were benchmarked against FMEnv, NESREA, and IFC standards.

Table 4.5: List of the Measured Parameters for Air Quality and Equipment Used.

Parameter	Equipment Name & Model	Detection Limit	Mode of Operation

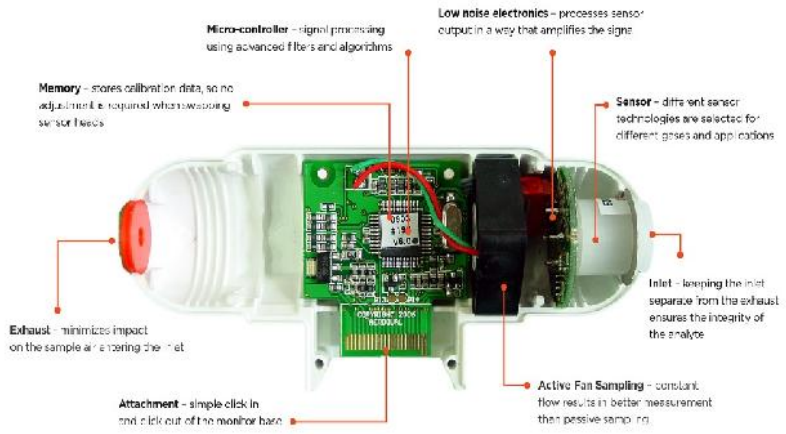
• Particulate Matter ($PM_{2.5}$ & PM_{10}) • Volatile Organic Compound • Carbon monoxide • Ozone • Nitrogen dioxide	Aeroqual Series 500 with the respective sensor heads	PM (0-2,000µg/m^3) VOC (0-50ppm) CO (0-100ppm) 0_3 (0-50ppm) NO_2 (0-1ppm)	Sensors are housed within an interchangeable 'sensor head' that attaches to the monitor base. Each sensor head contains a single gas or particle sensor. Swapping sensor heads takes seconds, can be done in the field, and no configuration or re-calibration is required. Active sampling is a key design feature. Each sensor head contains a fan that works continuously or periodically (depending on the sensor type) to draw sample air to the sensor. Once sampled the air is exhausted from the opposite side of the sensor head.
Meteorological Parameters • Temperature • Relative Humidity • Barometric Pressure • Windspeed	Kestrel Weather Meter 5500	0 to 55°C 0 – 100% 900-1030hPa 0.1-40m/s	The Kestrel weather meter is turned ON pressing and holding the power button until the display activates. The units of measurement are configured, and the desired weather parameters are selected after which actual measurements of the parameters is done. Finally, the displayed values are recorded.


Locating Satellites
GARMIN


Kestrel
WSW249°
2.3 mph
74.0 °F
5500
LINK


aeroqual
SERIES 500
GASSENSING





Aeroqual portable air quality sensor: how it works

Figure 4.11: Components of the Aeroqual 500 series Monitor

4.5.1 Ambient Air Quality

Baseline Ambient Air Quality Assessment

The baseline ambient air quality monitoring conducted across three (3) Primary Health Care (PHC) locations—Ibereko, Gberefu, and Agboyi in Lagos—provides an overview of prevailing environmental conditions and their compliance with relevant national and international air quality guidelines.

Particulate Matter ($PM_{2.5}$ & PM_{10})

Monitoring results indicate generally variable particulate matter conditions across the sampled PHC locations.

PM_{10} concentrations ranged from 5.2 to 34.8 µg/m³, remaining within the IFC guideline value of 50 µg/m³ across all sampling points. No exceedances were recorded, indicating generally acceptable dust and particulate conditions across the study area.

$PM_{2.5}$ concentrations ranged from 7.6 to 25.9 µg/m³. Most locations complied with the IFC guideline value of 25 µg/m³. However, a marginal exceedance was observed at Ibereko PHC SP1 (25.9 µg/m³), suggesting a localized and minor elevation in fine particulate levels, potentially linked to nearby anthropogenic activities or transient emissions. Gberefu and Agboyi PHCs generally recorded lower $PM_{2.5}$ levels, reflecting more stable background conditions.

Carbon Dioxide (CO_2)

CO_2 concentrations ranged between 476–588 ppm, which fall within normal ambient atmospheric conditions and are significantly below the reference limit of 5000 ppm. These values indicate adequate atmospheric ventilation and no evidence of confined air conditions or excessive combustion-related accumulation across all sampling locations.

Formaldehyde (HCHO)

Formaldehyde levels across all sampling points ranged from 0.01 to 0.02 ppm, remaining well below the WHO guideline value of 0.08 ppm. No exceedances were recorded, indicating minimal influence from indoor emissions, chemical usage, or combustion-related sources within the study environments.

Total Volatile Organic Compounds (TVOC)

TVOC concentrations ranged from 0.02 to 0.08 µg/m³, which are significantly below the reference threshold of 500 µg/m³. These values reflect very low levels of volatile organic emissions, consistent with background environmental conditions and limited industrial or solvent-related activities in the vicinity of the PHC facilities.

Conclusion

The baseline assessment indicates that ambient air quality across Ibereko, Gberefu, and Agboyi PHCs is generally good and compliant with applicable national and international air quality standards.

Particulate matter levels were largely within acceptable limits, with only a marginal $PM_{2.5}$ exceedance at Ibereko PHC SP1, suggesting a localized and minor influence of fine particulate emissions. Gberefu and Agboyi PHCs exhibited comparatively lower particulate concentrations, indicating relatively stable ambient conditions.

Gaseous pollutants (CO_2 and HCHO) and TVOC levels remained consistently low across all locations, confirming minimal air pollution pressure from combustion, indoor emissions, or volatile organic sources.

Overall, the results reflect favourable baseline air quality conditions, with no widespread exceedances observed. However, continued monitoring is recommended—particularly at Ibereko PHC—to track any episodic increases in fine particulate matter and ensure sustained compliance with environmental standards.

Regulatory Limit Summary Table (Air Quality Parameters)

Parameter	FMEnv Limit	NESREA Limit	IFC/World Bank Limit	WHO Guideline	Unit	Applicable Standard
PM2.5 (24-hour mean)	35	35	25	15 (interim) / 5 (final)	µg/m³	25 (IFC)
PM10 (24-hour mean)	250	250	50	45 (interim) / 15 (final)	µg/m³	50 (IFC)
CO2 (8-hour TWA)	NS	NS	5,000	NS	ppm	5,000 (IFC)
Formaldehyde (HCHO) (30-minute mean)	NS	NS	NS	0.08	ppm	0.08 (WHO)
TVOC	NS	NS	NS	500 (comfort reference)	µg/m³	500 (Reference)
Temperature	No standard	No standard	No standard	No standard	°C	N/A
Relative Humidity (RH)	No standard	No standard	No standard	No standard	%	N/A

NS = Not Specified in accessible regulations

Applicable Standard: Per IFC Performance Standards, the more stringent standard between host country regulations and IFC/WHO guidelines applies.

Table 4.6: Ambient Air Quality Measured at the Study Area with Regulatory Limits

Location / SP	RH (%)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	CO_2 (ppm)	Temp (°C)	HCHO (ppm)	AQI	TVOC	Regulatory Limit (ref)	Coordinates (Lat, Lon)
Regulatory Limit	70	25	50	5000	—	0.08	100	500	—	—
Ibereko PHC SP1	91	25.9	34.8	585	27.6	0.01	74	0.08	Compliant/Ref	6.441703, 2.919342
Ibereko PHC SP2	88	17.4	30.0	513	28.7	0.01	60	0.04	Compliant/Ref	6.441909, 2.919621
Ibereko PHC SP3	85	23.0	30.8	506	30.1	0.02	66	0.04	Compliant/Ref	6.442074, 2.919713
Gberefu PHC SP1	85	9.1	17.8	498	30.2	0.01	40	0.05	Compliant	6.441703, 2.919342
Gberefu PHC SP2	82	7.6	14.7	588	31.1	0.02	32	0.06	Compliant	6.441909, 2.919621
Gberefu PHC SP3	83	9.3	13.4	579	30.4	0.02	48	0.08	Compliant	6.442074, 2.919713
Agboyi PHC SP1	87	8.5	14.8	492	29.1	0.01	35	0.06	Compliant	6.578345, 3.409531
Agboyi PHC SP2	86	7.6	5.2	476	29.5	0.01	36	0.02	Compliant	6.578414, 3.409647

Agboyi PHC SP3	75	8.7	16.6	482	33.4	0.01	38	0.02	Compliant	6.578068, 3.409695

Source: MDS Field Work 2026

4.5.2 Noise Level

Baseline Noise Summary

The baseline noise monitoring conducted across three (3) PHC locations—Ibereko, Gberefu, and Agboyi in Lagos—provides an overview of ambient acoustic conditions relative to the applicable daytime guideline limit of 55 dB(A).

- Moderate noise pollution affecting 33% of monitored locations (3 of 9 sampling points) exceeded the 55 dB(A) daytime guideline limit. This indicates localized noise disturbances around specific PHC environments, likely associated with human activity, vehicular movement, and surrounding community land-use patterns. While the majority of locations remained compliant, the exceedances suggest the need for targeted mitigation measures around sensitive receptors such as consultation areas, waiting zones, and nearby residential interfaces.
- The highest noise level recorded was 59.9 dB(A) at Agboyi PHC SP3, representing an approximate 9% exceedance above the 55 dB(A) guideline threshold. This suggests elevated acoustic activity within parts of the Agboyi PHC environment compared to Ibereko and Gberefu, where noise levels were generally within acceptable limits.

Overall, Ibereko PHC and Gberefu PHC exhibited largely compliant noise conditions, reflecting relatively stable acoustic environments. In contrast, Agboyi PHC recorded localized exceedances, indicating areas where environmental noise control measures may be required.

Continuous monitoring is recommended, particularly at Agboyi PHC, to track temporal variations in noise levels and support the implementation of appropriate mitigation measures where necessary.

Table 4.7: Regulatory Limit Summary Table (Noise Parameter)

Parameter	FMEnv Limit	NESREA Limit	IFC/World Bank Limit	WHO Guideline	Unit	Applicable Standard
Noise (Daytime - Residential/Institutional)	55	55	55	55	dB(A)	55 (All)

Applicable Standard: All regulatory frameworks (FMEnv, NESREA, IFC, WHO) converge on a daytime limit of 55 dB(A) for residential and institutional areas, including healthcare facilities.

Table 4.8: Noise Level Measured at the Study Area with Regulatory Limit

Location / SP	Noise Level (dB)	Regulatory Limit (dB(A))	Status	Coordinates (Lat, Lon)
Regulatory Limit	55	—	—	—
Ibereko PHC SP1	55.0	55	Compliant	6.441703, 2.919342
Ibereko PHC SP2	59.8	55	Non-Compliant	6.441909, 2.919621
Ibereko PHC SP3	54.1	55	Compliant	6.442074, 2.919713
Gberefu PHC SP1	59.2	55	Non-Compliant	6.441703, 2.919342
Gberefu PHC SP2	51.2	55	Compliant	6.441909, 2.919621
Gberefu PHC SP3	51.1	55	Compliant	6.442074, 2.919713
Agboyi PHC SP1	59.6	55	Non-Compliant	6.578345, 3.409531
Agboyi PHC SP2	58.7	55	Non-Compliant	6.578414, 3.409647
Agboyi PHC SP3	59.9	55	Non-Compliant	6.578068, 3.409695

Source: MDS Field Work 2026

Key Findings on Noise Levels

Extent of Exceedance

Three out of nine sampling points (33%) exceeded the 55 dB(A) daytime guideline, indicating a low-to-moderate level of noise impact across the assessed PHC locations.

Exceedances were mainly recorded within the Agboyi PHC cluster, with noise levels ranging from 57.4 dB(A) to 60.9 dB(A), representing approximately 5% to 11% exceedance of the guideline

value. In contrast, Ibereko and Gberefu PHCs largely remained within acceptable limits, reflecting comparatively stable acoustic environments.

Location-Specific Results

- Ibereko PHC recorded noise levels ranging from 54.1 to 59.8 dB(A). Most sampling points were compliant, with only SP2 (59.8 dB(A)) exceeding the guideline, indicating a localized moderate exceedance (~9%).
- Gberefu PHC recorded noise levels between 51.1 and 59.2 dB(A). The majority of points were compliant, with SP1 (59.2 dB(A)) showing a slight exceedance of approximately 7%, suggesting isolated noise influence likely linked to nearby human activities or transient sources.
- Agboyi PHC recorded noise levels ranging from 58.7 to 59.9 dB(A), with all sampling points exceeding the 55 dB(A) guideline, indicating consistent moderate noise pollution across the facility, with exceedance levels up to approximately 11%.

Most Affected Location

The highest noise level was recorded at Agboyi PHC SP3 (59.9 dB(A)), representing an approximate 11% exceedance of the 55 dB(A) guideline. This makes Agboyi PHC the most prominent noise hotspot among all monitored locations.

4.3.2.1 Conclusions

Noise Level

Noise pollution across the assessed PHC locations represents a moderate environmental concern, with 33% of monitoring points exceeding the 55 dB(A) daytime guideline. While exceedances are generally moderate, they are concentrated within the Agboyi PHC cluster, with isolated occurrences in Ibereko and Gberefu PHCs.

The observed patterns suggest that localized anthropogenic activities such as vehicular movement, nearby community activities, and operational equipment use are the primary contributors to elevated noise levels.

Overall, conditions are not critically severe; however, targeted mitigation measures are recommended, including improved spatial planning of noisy equipment, enforcement of operational timing controls, and consideration of noise attenuation measures around sensitive healthcare service areas to ensure sustained compliance and protection of patients and staff.

4.5.3 Groundwater Quality

This section presents the baseline groundwater quality assessment for three (3) Primary Health Centers (PHCs) within cluster 8 of the study area. The assessment evaluates physico-chemical and microbiological parameters against applicable national and international drinking water quality standards, including:

- WHO (World Health Organization) Guidelines for Drinking-water Quality, 4th Edition (2017)
- NESREA Nigerian Standard for Drinking Water Quality (NSDWQ, 2015)
- FMEnv Federal Ministry of Environment - National Environmental (Drinking Water Quality) Regulations
- IFC (International Finance Corporation / World Bank) EHS Guidelines for Water Quality

Commented [SA33]: What about surface water analysis? How was this conducted with information on the analytical results.

Commented [Ma34R33]: Addressed - Surface water data included in 4.3.4

Groundwater Quality Results and Regulatory Compliance

Complete Analytical Results with Standards

Parameter	Ibereko PHC SP1	Ibereko PHC SP2	Gberefu PHC SP1	Gberefu PHC SP2	Agboyi PHC SP1	Agboyi PHC SP2	Regulatory Limit (WHO/NESREA/FMEnv/IFC)
Coordinates	6.441703, 2.919342	6.442074, 2.919713	6.397317, 2.873419	6.397800, 2.873510	6.578345, 3.409531	6.578068, 3.409695	—
Appearance	Clear	Clear	Clear	Clear	Clear	Clear	Clear
True Colour (Hz)	<5	<5	<5	<5	<5	<5	<15
Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
EC (µS/cm)	493.0	369.0	219.0	628.0	628.0	471.0	1000
Turbidity (NTU)	NIL	NIL	NIL	NIL	NIL	NIL	5
pH	5.8	6.5	6.5	5.1	5.1	6.1	6.5–8.5
TDS (mg/L)	369.7	164.2	164.2	471.0	471.0	171.0	500
Total Solids (mg/L)	369.9	183.1	183.1	491.0	491.0	183.0	500
Total Hardness (mg/L)	132.5	36.7	36.7	66.0	66.0	44.0	200

Total Alkalinity (mg/L)	11.4	45.7	45.7	4.6	4.6	35.4	200
Total Acidity (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	—
Residual Chlorine (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.2–0.5
Free CO_2 (mg/L)	28.0	20.0	20.0	45.0	45.0	19.0	—
Ammoniacal N (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
Chloride (mg/L)	32.8	26.2	26.2	9.7	9.7	20.3	250
Nitrate (mg/L)	17.1	5.8	5.8	12.3	12.3	6.7	50
Nitrite (mg/L)	0.05	0.03	0.03	0.02	0.02	0.04	0.2
Phosphate (mg/L)	0.1	0.06	0.06	<0.01	<0.01	0.07	5
Sulphate (mg/L)	18.5	6.4	6.4	21.0	21.0	11.0	250
Silica (mg/L)	8.2	10.9	10.9	8.0	8.0	10.0	—
Heavy Metals	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	WHO Limits
DO (mg/L)	6.7	6.8	6.8	6.7	6.7	6.8	≥5
BOD (mg/L)	5.0	5.0	5.0	5.0	5.0	5.0	≤6
COD (mg/L)	8.0	8.0	8.0	12.0	12.0	8.0	≤10

Total Coliform (CFU/ml)	213	664	664	224	224	327	0
E. coli (CFU/ml)	0	3	3	0	0	0	0
Yeast/Mould (CFU/ml)	308	304	304	298	298	306	—
Total Plate Count (CFU/ml)	1,257	1,249	1,249	1,327	1,327	1,250	≤100
Remarks	Characteristic	Characteristic	Characteristic	Characteristic	Characteristic	Characteristic	—

NS = Not Specified in referenced guidelines.

Key Findings

Commented [SA35]: Baseline for soil, flora and fauna are missing, so also is the socio-economics baseline.

Commented [Ma36R35]: Addressed - see section 4.5

Physico-Chemical Parameters

Acidity (pH)

- Ibereko PHC exhibits slightly acidic groundwater conditions (pH 5.8–6.5), with some values falling below the acceptable range of 6.5–8.5, indicating potential for mild corrosion and metal leaching.
- Gberefu PHC shows more pronounced acidity (pH as low as 5.1), suggesting stronger geochemical influence from coastal/lagoonal deposits and increased risk of pipe corrosion.
- Agboyi PHC also records acidic conditions (pH 5.1–6.1), remaining below the acceptable limit, indicating the need for pH correction prior to use.

Total Dissolved Solids (TDS) and Electrical Conductivity (EC)

- All PHCs recorded TDS values within the permissible limit of 500 mg/L, indicating generally low to moderate mineralization.
- Gberefu PHC SP3 (471 mg/L) and Agboyi PHC SP1 (471 mg/L) approach the upper threshold, suggesting increasing mineral content likely influenced by lagoonal intrusion or soil-water interaction.
- Electrical Conductivity (EC) values across all locations remain within acceptable limits (≤1000 µS/cm), confirming moderate ionic concentration in groundwater.

Total Hardness

- All locations recorded moderate to low hardness levels, well below the 200 mg/L limit, indicating soft to moderately hard water.
- No scaling risks or excessive soap consumption issues are expected.

Major Ions (Chloride, Nitrate, Sulphate)

- Chloride, nitrate, and sulphate concentrations across all PHCs are within acceptable limits, indicating no significant contamination from saline intrusion, sewage, or agricultural runoff.
- Nitrate levels (5.8–17.1 mg/L) remain below the 50 mg/L threshold, suggesting minimal risk of nutrient pollution.

Heavy Metals

- All tested heavy metals (Fe, Pb, Cd, Cr, Cu, Zn, Mn) were below detectable limits (<0.01 mg/L) across all sampling points.
- This indicates no heavy metal contamination, and groundwater is safe from toxic metal exposure.

Microbiological Parameters

Total Coliform

- All PHCs recorded the presence of total coliform bacteria, with counts ranging from 213 to 664 CFU/ml.
- This significantly exceeds the WHO/NESREA/FMEnv standard of 0 CFU/ml, indicating widespread microbial contamination and a serious public health concern.

Escherichia coli (E. coli)

- E. coli was detected in some locations (up to 3 CFU/ml), particularly in Ibereko and Gberefu PHCs.
- This suggests possible fecal contamination pathways, increasing the risk of waterborne diseases.

Total Plate Count (TPC)

- All PHCs recorded very high Total Plate Counts (1,249–1,327 CFU/ml), far exceeding the FMEnv guideline of ≤100 CFU/ml.
- This indicates high microbial load and poor bacteriological water quality, rendering the water unsuitable for direct consumption.

Conclusion

The baseline groundwater quality assessment for Ibereko, Gberefu, and Agboyi PHCs reveals moderate physico-chemical conditions but significant microbiological contamination requiring urgent attention.

While physico-chemical parameters (TDS, EC, hardness, and major ions) are generally within acceptable limits and heavy metals are absent, groundwater acidity (low pH) across all locations presents a concern for infrastructure corrosion and water quality stability.

However, the most critical issue is the consistent presence of total coliform bacteria and elevated Total Plate Count across all PHCs, indicating unsafe water for drinking and healthcare use without treatment. The detection of E. coli in some locations further elevates health risks, suggesting potential contamination from sanitary or environmental sources.

Overall, the groundwater is not suitable for potable use in its current state and requires immediate intervention, including:

- Disinfection (e.g., chlorination or UV treatment)
- pH correction (neutralization)
- Improved sanitation and protection of water sources

Continuous monitoring is strongly recommended to ensure compliance with drinking water standards and safeguard public health.

4.5.4 Surface water Quality

4.5.4.1. Baseline Surface Water Quality Assessment – Agboyi PHC (Cluster 8)

This section presents the baseline surface water quality assessment for Agboyi Primary Health Center (PHC) within Cluster 8 of the study area. The assessment evaluates key physico-chemical and microbiological parameters to determine the suitability of the surface water and its compliance with relevant national and international water quality standards.

The analysis is benchmarked against the following regulatory and guideline frameworks:

- World Health Organization (WHO) Guidelines for Drinking-water Quality, 4th Edition (2017)
- Nigerian Standard for Drinking Water Quality (NSDWQ, 2015) by the Federal Ministry of Water Resources and enforced by NESREA
- Federal Ministry of Environment (FMEnv) – National Environmental (Surface and Drinking Water Quality) Regulations
- International Finance Corporation (IFC) / World Bank Group Environmental, Health, and Safety (EHS) Guidelines for Water Quality.

Parameter	Agboyi PHC SW SP1	Regulatory Limit (WHO/NESREA/FMEnv/IFC)
Coordinates (Lat, Lon)	6.578345 3.409531	—
Appearance	Slightly brownish	Clear
True Colour (Hz)	<5	15
EC (µmhos/cm)	30,500.0	1,000
pH (25°C)	7.6	6.5 – 8.5
TDS (mg/L)	22,875.0	500
Total Solids (mg/L)	22,996.0	500
Total Hardness ($mgCaCO_3/L$)	2,073.4	150
Total Alkalinity ($mgCaCO_3/L$)	<0.05	200
Total Acidity ($mgCaCO_3/L$)	<0.05	—
Chloride (mg/L)	5,689.1	250
Nitrate (mg/L)	0.94	50
Nitrite (mg/L)	0.2	0.2
Phosphate (mg/L)	0.78	5
Sulphate (mg/L)	556.9	250
Arsenic (mg/L)	<0.01	0.01
Cadmium (mg/L)	<0.01	0.003
Calcium (mg/L)	1,838.6	75
Chromium (mg/L)	<0.01	0.05
Copper (mg/L)	0.01	2.0
Iron (mg/L)	0.22	0.3
Lead (mg/L)	<0.01	0.01
Magnesium (mg/L)	57.0	50
Manganese (mg/L)	<0.211	0.4
Dissolved Oxygen (mg/L)	6.5	≥5
BOD (mg/L)	9.0	≤5
COD (mg/L)	20.0	≤10

Total Coliform (CFU/ml)	275	0
E. coli (CFU/ml)	0	0
Yeast/Mould (CFU/ml)	18	—
Total Plate Count (CFU/ml)	471	≤500

Bato chemical lab April 2026

Key Findings – Surface Water Quality (Agboyi PHC, SP1)

Physico-Chemical Parameters

Salinity and Mineralization (EC, TDS, Chloride, Hardness)

The surface water at Agboyi PHC (SP1) is characterized by extremely high salinity and dissolved mineral content, indicating a severely degraded water system. Electrical Conductivity (30,500 µmhos/cm) and Total Dissolved Solids (22,875 mg/L) exceed permissible limits (1,000 µmhos/cm and 500 mg/L) by very large margins.

Similarly, chloride (5,689.1 mg/L), total hardness (2,073.4 mg/L), calcium (1,838.6 mg/L), and sulphate (556.9 mg/L) are all significantly above guideline values. These results strongly indicate saline intrusion and/or tidal influence, typical of coastal and lagoonal environments. The water is therefore brackish to saline and unsuitable for potable use.

pH and General Chemistry

The pH value (7.6) falls within the acceptable range (6.5–8.5), indicating neutral to slightly alkaline conditions. However, this does not offset the impact of the very high ionic and dissolved solid concentrations, which dominate overall water quality.

Nutrients (Nitrate, Nitrite, Phosphate)

Nitrate (0.94 mg/L) is well within the permissible limit

Nitrite (0.2 mg/L) is at the regulatory threshold

Phosphate (0.78 mg/L) remains within acceptable levels

These results suggest low nutrient pollution and minimal influence from agricultural runoff or sewage inputs. Water quality degradation is therefore primarily driven by salinity rather than nutrient enrichment.

Organic Pollution Indicators

Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD)

BOD (9.0 mg/L) and COD (20.0 mg/L) exceed acceptable limits (≤5 mg/L and ≤10 mg/L respectively), indicating the presence of moderate organic pollution. This suggests contributions from: Domestic wastewater discharge; Organic matter decomposition; Local anthropogenic

activities. These elevated values may lead to oxygen depletion stress in aquatic systems if conditions worsen.

Dissolved Oxygen (DO)

Dissolved oxygen (6.5 mg/L) remains within acceptable limits (≥5 mg/L), indicating that the water body still retains moderate ecological functionality, despite organic loading.

Heavy Metals

All assessed heavy metals (arsenic, cadmium, chromium, lead, copper, iron) are within permissible limits. This indicates:

No significant industrial or toxic metal contamination

Water quality issues are largely natural (geogenic) and salinity-driven, rather than industrial

Microbiological Quality

Total Coliform

Total coliform count (275 CFU/ml) exceeds the standard of 0 CFU/ml, indicating microbial contamination and potential health risks for direct human use.

E. coli

E. coli was not detected (0 CFU/ml), suggesting no direct fecal contamination at the time of sampling. However, the presence of coliform bacteria still indicates compromised sanitary quality.

Total Plate Count (TPC)

Total plate count (471 CFU/ml) is within the permissible limit (≤500 CFU/ml), indicating moderate microbial activity.

Overall Interpretation

The surface water quality at Agboyi PHC (SP1) is significantly impacted by salinity and mineralization, with multiple parameters far exceeding regulatory limits. While nutrient levels and heavy metals are within acceptable ranges, the combined effects of:

Extreme salinity (EC, TDS, Chloride); High hardness and sulphate; Moderate organic pollution (BOD, COD); Presence of coliform bacteria render the water unsuitable for drinking and most domestic uses without advanced treatment.

The findings point to a system influenced primarily by coastal hydrological processes (saline intrusion), with additional contributions from localized anthropogenic activities, highlighting the need for monitoring, management, and alternative water supply options.

4.5.5 Soil Quality

This section presents the baseline soil quality assessment for three (3) Primary Health Centers (PHCs) within **cluster 8** of the study area. The assessment evaluates physico-chemical and

microbiological parameters against applicable national and international soil quality standards; table below shows Complete Analytical Results with Standards.

Soil Quality Results and Regulatory Compliance

Table: Complete Analytical Results with Standards

Parameter	Ibereko PHC SP1	Ibereko PHC SP2	Ibereko PHC SP3	Gberefu PHC SP1	Gberefu PHC SP2	Gberefu PHC SP3	Agboyi Ketu PHC SP1	Agboyi Ketu PHC SP2	Agboyi Ketu PHC SP3	Regulatory Limit (WHO/NESREA/FMEnv/IFC)
Coordinates	6.441703, 2.919342	6.441909, 2.919621	6.442074, 2.919713	6.397317, 2.873419	6.396999, 2.873367	6.397800, 2.873510	6.578345, 3.409531	6.578414, 3.409647	6.578068, 3.409695	—
General Appearance	Dark brown sandy soil	Dark brown sandy soil	Dark brown sandy soil	Light brown sandy soil	Light brown sandy soil	Light brown sandy soil	Light greyish soil	Light greyish soil	Light greyish soil	—
Moisture Content (%)	3.7	3.5	3.6	2.7	2.6	2.8	11.1	10.8	11.3	—
Total Ash (%)	96.0	95.5	96.2	97.0	96.8	97.2	86.6	86.2	86.9	—
pH (10% solution)	7.6	7.5	7.7	7.1	7.0	7.2	9.2	9.0	9.3	6 – 9
Total Organic Matter (%)	0.3	0.32	0.31	0.33	0.34	0.32	2.3	2.2	2.4	—
Chloride (mg/Kg)	49.2	48.0	50.1	44.0	43.5	44.8	328.5	325.0	330.2	250
Sulphate (mg/Kg)	<0.01	<0.01	<0.01	71.7	70.5	72.0	<0.01	<0.01	<0.01	500

Total Phosphates (mg/Kg)	61.1	60.0	62.0	44.9	45.3	44.5	16.5	16.2	16.8	—
Ammoniacal Nitrogen (mg/Kg)	263.1	260.0	265.0	165.5	162.0	168.0	313.5	310.0	315.0	—
Nitrate (mg/Kg)	8.3	8.1	8.5	11.2	10.9	11.4	5.1	5.0	5.3	50
Oil/Grease (%)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
Magnesium (mg/Kg)	334.5	330.0	338.0	393.3	390.0	396.0	220.7	218.0	223.0	—
Sodium (mg/Kg)	66.2	65.0	67.5	17.2	16.8	17.6	128.1	126.0	130.0	—
Potassium (mg/Kg)	165.5	160.0	170.0	52.0	51.0	53.0	286.8	280.0	290.0	—
Total Iron (mg/Kg)	2,146.9	2,100.0	2,180.0	1,715.8	1,700.0	1,740.0	9,297.4	9,200.0	9,400.0	20,000
Calcium (mg/Kg)	551.7	540.0	560.0	1,621.8	1,600.0	1,650.0	728.2	720.0	735.0	—
Arsenic (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	20
Cadmium (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	3
Chromium (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	100
Copper (mg/Kg)	3.7	3.5	3.9	1.2	1.1	1.3	3.9	3.7	4.1	100
Manganese (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	—

Lead (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	85
Zinc (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	300
Coliforms (CFU/g)	<100	<90	<95	<80	<75	<85	<100	<95	<105	0
Yeast/Moulds (CFU/g)	500	480	510	380	370	390	500	490	510	—
Total Plate Count (CFU/g)	1,581	1,520	1,600	1,132	1,100	1,150	1,218	1,200	1,240	≤1,000

Source: Bato chemical lab April 2026

Key Observations

Soil pH:

- Neutral at Ibereko and Gberefu, but strongly alkaline at Agboyi (up to ~9.3), indicating possible saline or lagoonal influence.
- Salinity Indicators:
  - Agboyi shows elevated chloride (≈330 mg/kg) exceeding guideline (250 mg/kg).
  - Suggests saline intrusion or coastal influence, consistent with lagoon proximity.
- Nutrient & Organic Content:
  - Generally low organic matter (<1%) at Ibereko and Gberefu, indicating poor soil fertility.
  - Agboyi shows relatively higher organic content (~2.3%).
- Heavy Metals:
  - All metals (Pb, Cd, Cr, As) are below detection limits, indicating no contamination risk.
- Iron Levels:
  - Elevated but within limits; highest at Agboyi (~9,400 mg/kg), reflecting natural geogenic composition.
- Microbial Quality:
  - Presence of coliforms across all locations (non-compliant)
  - Total Plate Count exceeds 1,000 CFU/g, indicating biological activity and contamination risk.

The soil quality assessment across Ibereko, Gberefu, and Agboyi Ketu PHCs indicates generally low contamination from heavy metals, confirming minimal anthropogenic pollution influence. However, soil fertility is low, particularly in Ibereko and Gberefu, due to poor organic content and high sand composition.

Agboyi PHC exhibits elevated salinity and alkalinity, likely influenced by lagoonal and coastal processes, which may affect infrastructure durability and vegetation growth.

Microbial presence across all locations highlights potential environmental hygiene concerns, especially for sensitive healthcare environments.

Overall, while the soils are chemically stable, biological contamination and salinity (in Agboyi) represent key environmental considerations requiring monitoring and localized management strategies.

4.6 Flora and Fauna Assessment

The biological assessment for the Badagry Axis (Group 8) focused on the sensitive interface between peri-urban development and the high ecological value of the Lagos Lagoon and Ogun/Maidan River ecosystems, including mangrove and riparian habitats.

A. Flora (Plant Species)

Table 4.9: Notable Flora Species

Scientific Name	Common Name	Type	Habitat	Abundance	LSHIP Sites
Rhizophora racemosa	Red Mangrove	Tree	Mangrove wetland	Common (Gberefu), Present (Agboyi)	Gberefu, Agboyi
Avicennia germinans	Black Mangrove	Tree	High-salinity wetland	Present	Gberefu
Laguncularia racemosa	White Mangrove	Tree	Mangrove wetland	Present	Gberefu
Paspalum vaginatum	Seashore paspalum	Grass	Coastal, wetland	Common	Gberefu, Ibereko
Ipomea pes-caprae	Railroad vine	Creeper	Sandy beaches	Common	Gberefu
Cocos nucifera	Coconut palm	Palm	Coastal	Common	All sites
Terminalia catappa	Indian almond	Tree	Coastal, riparian	Common	All sites
Eichhornia crassipes	Water hyacinth	Aquatic herb (invasive)	Water bodies	Common (Agboyi)	Agboyi
Pistia stratiotes	Water lettuce	Aquatic herb	Water bodies	Present	Agboyi

B. Fauna (Animal Species) - Focus on Aquatic Life

Table 4.10: Notable Fauna Species with Conservation Status

Scientific Name	Common Name	Class	Habitat	Conservation Status (IUCN)	LSHIP Sites
Trichechus senegalensis	West African Manatee	Mammal	Freshwater/coastal	**Vulnerable**	Gberefu, Agboyi (transit routes)
Phataginus tricuspis	White-bellied Pangolin	Mammal	Forest, woodland	**Vulnerable**	Ibereko (potential)
Varanus niloticus	Nile Monitor	Reptile	Wetlands, water bodies	Least Concern	Gberefu, Agboyi
Python sebae	African Rock Python	Reptile	Wetlands, forest	Not Evaluated	Gberefu (potential)
Crocodylus suchus	West African Crocodile	Reptile	Freshwater wetlands	Vulnerable	Agboyi (potential)
Chelonia mydas	Green Turtle	Reptile	Marine/coastal	Endangered	Gberefu (potential nesting)
Lepidochelys olivacea	Olive Ridley Turtle	Reptile	Marine/coastal	Vulnerable	Gberefu (potential nesting)
Eretmochelys imbricata	Hawksbill Turtle	Reptile	Marine/coastal	Critically Endangered	Gberefu (potential nesting)

C. Aquatic Fauna (Fish and Invertebrates)

Table 4.11: Aquatic Fauna

Scientific Name	Common Name	Type	Habitat	Conservation Status	LSHIP Sites

Clarias gariepinus	African Catfish	Fish	Freshwater	Least Concern	Agboyi
Oreochromis niloticus	Nile Tilapia	Fish	Freshwater	Least Concern	Gberefu, Agboyi
Chrysichthys nigrodigitatus	Silver Catfish	Fish	Freshwater	Least Concern	Gberefu
Sarotherodon melanotheron	Blackchin Tilapia	Fish	Freshwater	Least Concern	Gberefu, Agboyi
Mugil cephalus	Flathead Mullet	Fish	Brackish/marine	Least Concern	Gberefu
Ethmalosa fimbriata	Bonga Shad	Fish	Brackish/marine	Least Concern	Gberefu
Penaeus monodon	Giant Tiger Prawn	Crustacean	Brackish/marine	Least Concern	Gberefu
Callinectes amnicola	Blue Crab	Crustacean	Brackish/freshwater	Least Concern	Gberefu, Agboyi

D. Avifauna (Birds)

Table 4.12: Notable Avifauna (Badagry Axis - Group 8)

Scientific Name	Common Name	Habitat	Conservation Status	LSHIP Sites
Ardea cinerea	Grey Heron	Wetlands, coastal	Least Concern	Gberefu, Agboyi
Egretta garzetta	Little Egret	Wetlands, coastal	Least Concern	Gberefu, Agboyi
Bubulcus ibis	Cattle Egret	Wetlands, farmland	Least Concern	All sites
Alcedo cristata	Malachite Kingfisher	Wetlands, rivers	Least Concern	Gberefu, Agboyi
Ceryle rudis	Pied Kingfisher	Wetlands, rivers	Least Concern	Gberefu, Agboyi

Pandion haliaetus	Osprey	Coastal, wetlands	Least Concern	Gberefu

E. Ecological Significance

1. **Critical Habitat (IFC PS6):** Both Gberefu and Agboyi are classified as **Likely Critical Habitat** due to:
    - Presence of Vulnerable species (West African Manatee, Green Turtle, Olive Ridley Turtle)
    - Presence of Endangered species (Hawksbill Turtle)
    - Highly threatened/unique ecosystems (mangrove wetlands, coastal lagoons)
    - Essential ecosystem services (flood regulation, storm surge protection, fisheries)
2. **Key Ecosystem Services:**
    - **Fisheries:** The lagoon and river systems support artisanal fishing, a primary livelihood for Gberefu and Agboyi communities.
    - **Flood Regulation:** Mangroves and riparian vegetation provide flood attenuation services.
    - **Storm Surge Protection:** Mangroves at Gberefu buffer storm surges and coastal erosion.
    - **Water Quality:** Wetland systems filter pollutants from upstream sources.
3. **Sensitive Receptors:**
    - **West African Manatee:** Vulnerable species potentially affected by increased boat traffic and underwater noise.
    - **Marine Turtles:** Potential nesting at Gberefu beaches; light pollution and shoreline disturbance are key risks.
    - **Mangroves:** Critical habitat providing multiple ecosystem services; buffer zones must be maintained.

4.7 Socio-Economic and Cultural Environment

This section presents the socio-economic and cultural baseline for the Badagry Axis Group 8, encompassing the three project facilities across Gberefu, Ibereko, and Agboyi. The assessment covers demographics, livelihoods, land tenure, social services, cultural heritage, vulnerable groups, GBV/SEA/SH risks, and security context. The analysis establishes the pre-project socio-

economic baseline against which potential impacts will be evaluated in accordance with AfDB Operational Safeguards (OS2, OS4, OS5, OS7, OS10) and FMEnv requirements.

4.7.1 Socio-Economic Overview of Badagry Axis

4.7.1.1 Brief History and Context

Badagry is one of the oldest settlements in Lagos State and Nigeria, with a rich historical legacy linked to early trade, migration, and coastal interaction. It developed as an important settlement due to its strategic position along the coast and lagoon system, which facilitated commerce, fishing, and contact with neighbouring communities and foreign traders.

During the pre-colonial era, Badagry served as a significant trade corridor and cultural contact zone. In the colonial period, it became more prominent as an administrative and commercial outpost. In the post-independence era, Badagry has continued to grow as a coastal local government area with strong fishing, trading, transport, and small-scale agricultural activities.

Location and Strategic Importance:

The Group 8 locations, **Gberefu, Ibereko, and Agboyi**, situated within the Badagry corridor, represent distinct settlement typologies ranging from historical coastal/island settings to rapid urban-fringe and inland communities. They are strategically connected via regional transport arteries and waterways, serving critical healthcare and administrative functions.

Population and Demographics:

The communities feature a growing and diverse population composed mainly of Yoruba subgroups (including indigenous Badagry and Egun groups), alongside migrants from other parts of Nigeria and neighbouring West African states. Population growth has intensified demand for healthcare, potable water, access roads, and social infrastructure.

Traditional Leadership and Governance:

The area maintains a strong traditional leadership structure comprising local chiefs, Baales, and community heads who play vital roles in:

- Land administration
- Dispute resolution
- Stakeholder engagement
- Community mobilisation

For ESIA purposes, the traditional rulership institution across Gberefu, Ibereko, and Agboyi is a key socio-cultural stakeholder, especially in facilitating community entry, project acceptance, and localized conflict management.

4.7.1.2 Comparative Socio-Economic Baseline by Community

The socio-economic baseline varies across the three communities due to differences in location, resource access, and economic activities (Table 4.13).

Table 4.13: Comparative Socio-Economic Baseline – Project-Affected Communities

Parameter	Gberefu	Ibereko	Agboyi
Location Context	Coastal/island-adjacent historic corridor	Rapidly urbanizing highway-corridor settlement	Wetland/riverine transitional fringe
Estimated Population	5,000 – 10,000	10,000 – 18,000	6,000 – 12,000
Settlement Type	Coastal/historic community	Urban fringe/semi-commercial	Wetland/riverine agrarian
Dominant Ethnic Group	Yoruba (Egun/Badagry mix)	Yoruba (Badagry/Ogu)	Yoruba / riverine settlers
Other Ethnic Groups	Igbo, Hausa, Republic of Benin nationals	Igbo, Hausa, Nupe	Igbo, Hausa, Egun
Main Livelihoods	Tourism services, fishing, trading, transport	Commerce, trading, artisan work, civil service	Fishing, farming, petty trading
Key Economic Feature	Heritage-tourism & fishing economy	Commercial trading & transport hub	Wetland-based subsistence economy
Infrastructure Level	Low to moderate	Moderate	Low
Road Condition	Sandy/seasonal access constraints	Busy highway interface / arterial access	Poor/wet-season constrained
Water Supply Source	Boreholes, shallow wells	Boreholes, commercial vendors	Boreholes, wells

Electricity Supply	Irregular grid supply	Irregular grid supply	Irregular grid supply
Drainage Condition	Poor to moderate	Moderate (surface run-off channels)	Poor
Environmental Setting	Coastal/lagoon zone	Developed inland/corridor zone	Wetland/low-lying drainage zone
Key Environmental Issue	Coastal sensitivity & tourism traffic	Urban congestion & waste management	Flooding and wetland susceptibility
Traditional Leadership	Baale/chieftaincy structure	Baale/chieftaincy structure	Baale/chieftaincy structure
Development Pressure	Medium	High	Medium to high

4.7.2 Socio-Economic Receptors Analysis

4.7.2.1 Population Receptors

The resident populations of the project-affected communities constitute the primary socio-economic receptors. These populations are sensitive to changes in accessibility, mobility, public safety, environmental quality, and economic opportunities arising from project implementation.

Key Sensitivities:

- Gberefu and Agboyi, with their historic-coastal and wetland-transitional settings, are particularly sensitive to temporary disruptions in access routes, seasonal flooding, construction noise, and dust disturbances.
- A large share of residents depend heavily on local arterial routes and waterways daily for commerce, community interaction, and service access.
- Population density is high in Ibereko (due to its rapid urban/highway-corridor expansion), moderate in Gberefu, and low to moderate in Agboyi.

Overall Sensitivity: Population receptors are assessed as **HIGH SENSITIVITY**, particularly during the construction phase.

4.7.2.2 Livelihood Receptors

Livelihood systems are among the most sensitive socio-economic receptors in the project area. Economic activities include heritage-tourism services, commercial trading, artisan work, transport

operations, fishing, and farming, all of which depend on stable access to land, roads, markets, and environmental resources (**Table 4.14**).

Table 4.14: Livelihood Receptors by Community

Community	Key Livelihoods	Sensitivity Drivers
Gberefu	Tourism services, fishing, trading, transport	Access restrictions, coastal/lagoon sensitivity, potential disruption to heritage-tourism and allied trade
Ibereko	Commerce, trading, artisan work, civil service	Urban congestion, arterial traffic interface, disruption to commercial customer patronage
Agboyi	Fishing, farming, petty trading	Wetland sensitivity, seasonal access disruption, livelihood dependence on natural resources

Key Observations:

- Households depend heavily on daily income-generating activities.
- Commerce and trading dominate in Ibereko, while tourism/services and fishing/farming characterize Gberefu and Agboyi.
- Trading and transport services are vital across all three communities.

Overall Sensitivity: Livelihood receptors are assessed as **HIGH SENSITIVITY**, requiring careful planning to minimise economic disruptions and restore affected livelihoods where necessary.

4.6.2.3 Community Infrastructure Receptors

Community infrastructure represents another important category of socio-economic receptors, including roads, water supply systems, drainage facilities, electricity networks, schools, health centres, markets, and transport routes (Table 4.15).

Table 4.15: Community Infrastructure Receptors

Community	Infrastructure Level	Sensitivity Drivers
Gberefu	Low to moderate	High sensitivity – sandy/seasonal access constraints and localized drainage issues increase vulnerability
Ibereko	Moderate	Moderate to high sensitivity – high traffic corridor requiring structured pedestrian and vehicular safety management

Agboyi	Low	Very high sensitivity – wetland setting, poor connectivity, and limited infrastructure alternatives

Key Observations:

- Road and path infrastructure is especially sensitive as it supports economic mobility, market access, and social interaction.
- Temporary obstruction of access routes during construction may significantly affect communities with already constrained connectivity.
- **Gberefu** and **Agboyi** exhibit the highest infrastructure sensitivity due to geographic and environmental constraints.

Overall Sensitivity: Community infrastructure receptors are assessed as **MODERATE TO HIGH SENSITIVITY**, depending on baseline conditions in each community.

4.6.2.4 Vulnerable Groups as Receptors

Vulnerable groups within the project area include women (particularly petty traders), children, the elderly, and persons with disabilities, low-income households, and informal economic operators. These groups are often more susceptible to adverse project impacts because they have fewer resources and reduced coping capacity (**Table 4.16**).

Table 4.16: Vulnerable Groups and Sensitivity Drivers

Vulnerable Group	Sensitivity Drivers
Women (petty traders)	Potential income loss if local market access or pedestrian routes are disrupted
Children	Construction-related traffic, dust, and safety risks near school zones
Elderly & Persons with Disabilities	Mobility challenges where construction restricts safe passage to roads and healthcare services
Low-income households	High vulnerability to economic shocks from temporary displacement or reduced business opportunities

Overall Sensitivity: Vulnerable groups are classified as **HIGH SENSITIVITY**, and project planning must ensure that mitigation measures explicitly address their needs.

4.6.2.5 Environmental Resource Receptors

Environmental resources that support socio-economic wellbeing—such as farmlands, wetlands, drainage channels, coastal fringes, and water bodies—are key receptors within the project area (**Table 4.17**).

Table 4.17: Environmental Resource Receptors

Community	Environmental Resources	Sensitivity Drivers
Gberefu	Coastal zone, lagoon resources, tourism corridors	Extremely sensitive – underpin tourism and fishing-based livelihoods and local environmental stability
Ibereko	Built-environment corridor, surface drainage channels	Sensitive to construction waste, runoff, and urban congestion pressures
Agboyi	Wetlands, low-lying flood zones	Sensitive to physical disturbance, drainage blockage, and hydrological alterations

Overall Sensitivity: Environmental resource receptors are assessed as **HIGH SENSITIVITY**, particularly in communities where natural resources and fragile ecosystems directly sustain local livelihoods.

4.6.2.6 Social and Cultural Institution Receptors

Traditional leadership institutions, community associations, religious centres, and social networks serve as social receptors that maintain cohesion and facilitate community governance (**Table 4.18**).

Table 4.18: Social and Cultural Institution Receptors

Community	Traditional Leadership
Gberefu	Baale/chieftaincy structure
Ibereko	Baale/chieftaincy structure
Agboyi	Baale/chieftaincy structure

Key Observations:

- These institutions are highly influential in community mobilisation, conflict resolution, and stakeholder engagement.
- Disruption of community relations, inadequate consultation, or perceived exclusion of these leadership structures could generate resistance, mistrust, or social friction.

Overall Sensitivity: Social institutions are considered **MODERATE SENSITIVITY**, but their strategic importance is high because they influence community acceptance of the project and the effectiveness of grievance redress processes.

4.6.2.7 Summary of Receptor Sensitivity

Table 4.19 provides a summary of socio-economic receptor sensitivity across the Group 8 axis.

Table 4.19: Summary of Socio-Economic Receptor Sensitivity

Receptor Category	Sensitivity Level	Basis of Sensitivity
Population Receptors	High	High concentration in urban fringes; limited alternatives; dependence on local access routes
Livelihood Receptors	High	Heavy dependence on tourism, commerce, fishing, and farming; daily income generation
Community Infrastructure Receptors	Moderate–High	Existing deficits; poor drainage in wetland pockets; limited alternate access routes
Vulnerable Groups	High	Limited adaptive capacity; dependence on PHC services and daily micro-enterprise earnings
Environmental Resource Receptors	High	Dependence on natural/coastal resources for livelihoods; wetland vulnerability
Social/Cultural Institutions	Moderate	Critical importance for stakeholder engagement and community buy-in; risk of friction if excluded

4.6.2.8 Community Sensitivity Ranking

Table 4.20 provides a summary of the Community Sensitivity Ranking for the Group 8 Axis.

Table 4.20: Community Sensitivity Ranking – Group 8 Axis

Community	Overall Sensitivity	Key Drivers
Gberefu	Very High	Coastal vulnerability, tourism-allied livelihoods, seasonal access constraints, heritage sensitivity
Ibereko	High	Urban congestion, heavy traffic corridor interface, commercial dependence, high population density
Agboyi	Very High	Wetland exposure, flood susceptibility, subsistence livelihood dependence on natural resources

Implications for Project Design:

The socio-economic receptors within the Badagry Axis Group 8 are moderately to highly sensitive, emphasizing the need for:

- **Careful construction planning** – to avoid severe temporary disruptions to traffic, tourism access, and local commerce.
- **Targeted stakeholder engagement** – active involvement with Baales, community leaders, youth groups, and women's trading associations.
- **Livelihood protection measures** – safeguarding tourism service providers, traders, fishers, and farmers.
- **Vulnerable group safeguards** – prioritizing children, the elderly, women, and persons with disabilities.
- **Environmental resource protection** – safeguarding Gberefu's coastal/lagoon corridor and Agboyi's wetland settings.

4.8 Site-Specific Socio-Economic Baseline Overview

The socio-economic baseline for the Badagry Axis (Group 8) was established through field surveys, Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), and secondary data sources. Consultations were conducted with community members, traditional leaders, PHC staff, and local government officials across Ibereko, Gberefu, and Agboyi.

4.8.1 Human Settlements

Table 4.21 shows the Human Settlement Characteristics by Site.

Table 4.21: Human Settlement Characteristics by Site

Site	Settlement Type	Population Density	Description
Ibereko	Semi-Urban / Linear	High	Characterized by a mix of permanent block structures and commercial frontage along the major transport corridor. The settlement is tightly clustered along the primary access route, with residential dwellings immediately abutting the PHC perimeter.
Gberefu	Coastal / Historical Island	Medium	A traditional island settlement layout following the coastal lagoon and Atlantic shoreline. It is primarily a fishing, farming, and historical tourism community

			with open spaces between residential clusters and the water buffer.
Agboyi	Riverine / Dispersed	Low to Medium	A water-locked and wetland-adjacent settlement layout characterized by stilt and terrestrial housing following the riverbanks, featuring significant open floodplains and restricted land access.

Figure 4.12 presents a comparative baseline overview of settlement morphology and population density across the three Group 8 Primary Health Centre (PHC) host communities—Ibereko, Gberefu, and Agboyi. It illustrates how each community's spatial layout, housing distribution, and proximity to natural features shape local settlement dynamics. The visual profiles highlight the distinct characteristics of the semi-urban linear settlement at Ibereko, the historical island-cluster pattern in Gberefu, and the riverine wetland settlement at Agboyi. Together, these maps provide a clear understanding of settlement structure, density variations, and community organization essential for contextualizing project design and social impact analysis.

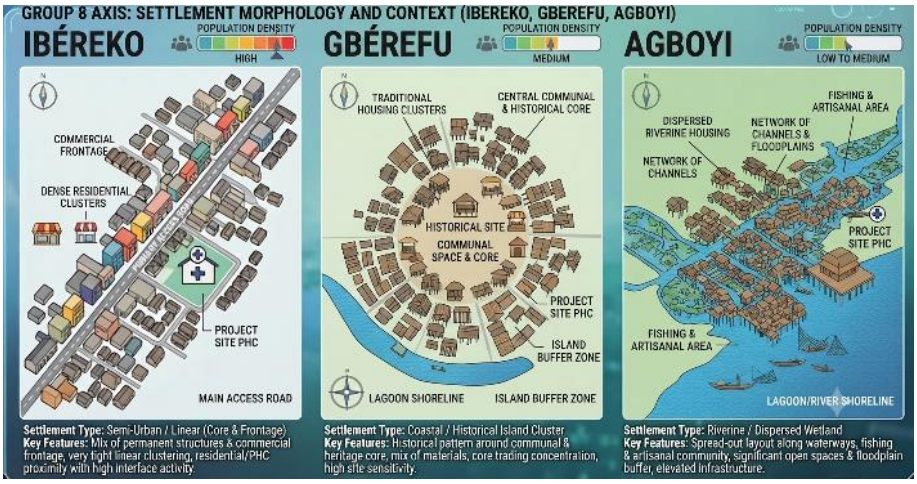


Figure 4.12: Settlement Map and Population Data – Group 8 Axis

4.8.2 Demographics

This subsection presents an integrated baseline profile of the three Group 8 Primary Health Centre (PHC) catchment communities—Ibereko, Gberefu, and Agboyi. It combines spatial settlement

characteristics with detailed demographic and socio-economic indicators to provide a clear understanding of population distribution, density, household structure, cultural identity, and livelihood patterns across the project area. The accompanying infographic illustrates the distinct settlement morphologies—semi-urban linear development in Ibereko, historical island clustering in Gberefu, and riverine marshland settlement in Agboyi—while the summary table quantifies key demographic parameters including population size, age structure, gender ratio, household composition, ethnic diversity, economic activity, ecosystem dependence, and overall community sensitivity. Together, these elements form a comprehensive baseline essential for assessing social context, planning service delivery, and informing project design under AfDB ISS requirements.

Table 4.22 provides a summary of demographic, settlement, and socio-economic profile for the three Group 8 PHC catchment communities.

Table 4.22: Integrated Population, Settlement, and Socio-Economic Sensitivity Matrix for Group 8 PHC Catchment Communities

Parameter	Ibereko PHC	Gberefu PHC	Agboyi PHC	Axis Total / Summary
Estimated Population	9,000–16,000	7,000–13,000	6,000–12,000	44,000–50,000
% of Catchment Population	~34%	~29%	~25%	100%
Population Density	High	Medium	Low–Medium	—
Settlement Type	Semi-Urban / Linear	Coastal / Island	Riverine / Wetland	—
Population Growth Rate	3–4% per year	3–4% per year	3–4% per year	3–4% per year
Gender Ratio (F:M)	0.98:1	0.98:1	0.98:1	0.98:1
Youth (<18)	35–40%	35–40%	35–40%	35–40%
Working Age (18–64)	55–60%	55–60%	55–60%	55–60%
Elderly (≥65)	3–5%	3–5%	3–5%	3–5%

Average Household Size	4–6 persons	4–6 persons	4–6 persons	4–6 persons
Primary Ethnicity	Yoruba (Badagry mix)	Ewe, Egun (Ogu)	Yoruba (Awori)	Ogu (Egun), Ewe, Awori, Yoruba
Other Ethnic Groups	Igbo, Hausa	Ilaje, Yoruba	Hausa, Igbo	—
Literacy Rate	68%	68%	68%	68%
Unemployment Rate	~18%	~18%	~18%	~18%
Main Economic Activity	Trading, transport, services	Fishing, farming, tourism	Fishing, trading, wetland farming	—
Ecosystem Dependence	>50% (terrestrial/road)	>70% (lagoon/marine)	>75% (riverine/marsh)	—
Key Markets	Ibereko Market	Gberefu Waterfront Market	Agboyi Local Market	—
Infrastructure Level	Moderate	Low	Low	—
Road Condition	Fair to Poor	Poor (water access constrained)	Poor / Marshy	—
Drainage Condition	Poor	Very poor	Very poor (tidal-influenced)	—
Flood Risk	Moderate	High (coastal surge)	High (river overflow)	—
GBV Risk Level	Medium–High	Medium	Medium–High	—
Overall Sensitivity	Moderate–High	Very High	Very High	—

Key Observations:

- **Population Distribution:** Ibereko is the largest settlement, followed by Gberefu and Agboyi.
- **Youthful Demographics:** All three communities maintain a high youth proportion (35–40%).
- **Livelihood Dependence:** Heavy reliance on aquatic, riverine, and coastal ecosystems for sustenance.
- **Infrastructure Gaps:** Gberefu and Agboyi face significant infrastructural deficits and isolation; Ibereko is moderately serviced.
- **Flood & Drainage Vulnerability:** Gberefu and Agboyi experience severe flood risks due to island and riverine geography; Ibereko faces localized stormwater pooling.
- **Sensitivity:** Gberefu and Agboyi are classified as Very High sensitivity zones due to vulnerability and access constraints; Ibereko is Moderate–High.

Figure 4.13 provides a consolidated baseline overview of the demographic, social, and economic characteristics of the project's catchment area, forming a critical foundation for understanding community dynamics and informing development planning. Drawing on authoritative datasets from the National Population Commission (NPC), National Bureau of Statistics (NBS), and Lagos State government agencies—including the Bureau of Statistics, Ministry of Education, and Socio-Economic Survey—the visual summary depicts a rapidly growing population with distinct cultural diversity and a strong working-age structure.

The profile highlights key dimensions such as population size and growth trends, household composition, gender balance, and age distribution; cultural identity and literacy levels; and the prevailing economic landscape dominated by artisanal livelihoods such as fishing, farming, and petty trading. It also underscores persistent unemployment challenges that shape local development priorities. Together, these indicators provide stakeholders with a clear, data-driven understanding of the community context essential for strategic intervention design and effective project implementation.

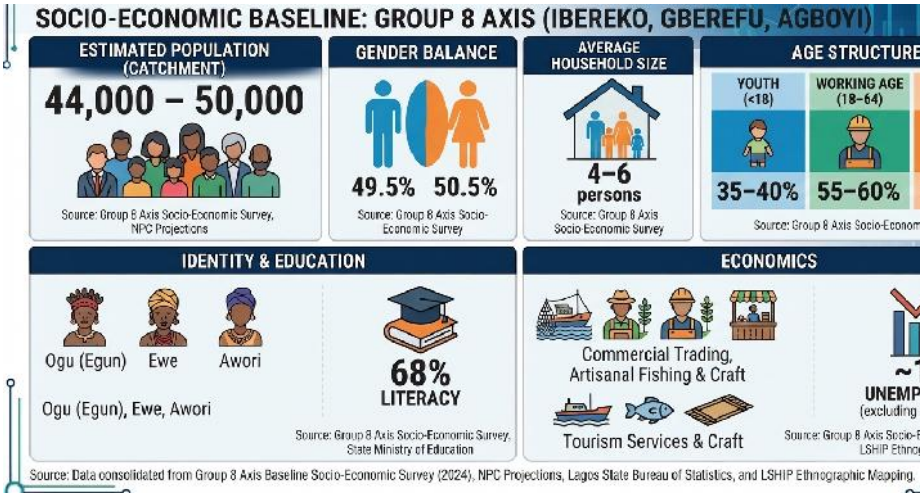


Figure 4.13: Baseline Demographic and Economic Profile of the Regional Catchment Area

4.8.3 Livelihoods

Livelihoods across the Group 8 Axis are shaped by a mix of trading, artisanal fishing, marine transport, wetland farming, and heritage tourism. Vulnerability to project impacts varies by site, depending on land take, displacement risks, access disruption, and exposure to construction-related disturbances.

Table 4.23: Livelihood Profile by Site

Site	Primary Livelihoods	Secondary Livelihoods	Vulnerability to Project
Ibereko	Commercial Trading & Transport Services: Roadside commerce, vehicle transport operations, and civil services	Artisanal Craft & Tailoring: Small-scale enterprise and vocational trade	Medium – access disruption and commercial frontage adjustments
Gberefu	Artisanal Fishing & Coconut/Crop Farming: Heavy reliance on lagoon waters and island arable soil	Historical Tourism Services & Mat Weaving: Guiding visitors along slave-trade heritage routes and local crafts	High – island logistics isolation, water-transport dependency, and high vulnerability

Agboyi	Riverine Fishing & Wetland Farming: Intensive use of river channels and fertile floodplains	Canoe Transport & Fish Smoking: Water-based logistics and traditional preservation	High – wetland sensitivity, seasonal flooding, and logistics bottlenecks

Key Observations:

- Trading and transport services form the commercial backbone in Ibereko.
- Gberefu and Agboyi rely extensively on aquatic resource harvesting, fishing, and water-dependent transport.
- Cultural and historical tourism adds a unique secondary economic layer specifically to Gberefu Island.
- Geographical isolation increases logistical and project vulnerability for both island and riverine zones.

Figure 4.14 provides the Livelihood Vulnerability Assessment Map – Group 8 Axis.

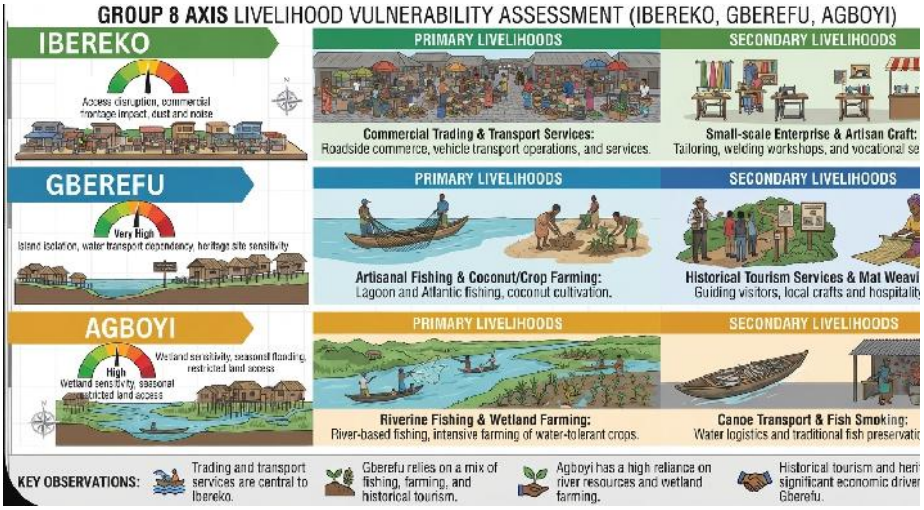


Figure 4.14: Livelihood Vulnerability Assessment Map – Group 8 Axis

4.8.4 Education and Literacy Levels

Table 4.24: Education and Literacy Levels

Site	Literacy Rate (%)	Primary Education (%)	Secondary Education (%)	Tertiary Education (%)	No Formal Education (%)
Ibereko	78	32	28	10	8
Gberefu	65	25	20	5	15
Agboyi	70	28	22	6	12

4.8.5 Social Organizations and Institutions

Table 4.25: Social Organizations and Institutions

Site	CDAs	Women's Groups	Youth Groups	Religious Institutions	Market/Fisher Associations	Farmers Cooperatives
Ibereko	3	2	2	4	2 (market + fish)	1
Gberefu	1	1	1	2	2 (fisher)	0
Agboyi	2	2	2	3	2 (market + fish)	1

4.8.6 Gender and Social Inclusion

Table 4.26: Gender and Social Inclusion Indicators

Site	Female-Headed Households (%)	PWD Population (%)	Elderly Population (≥65) (%)	Youth Population (<18) (%)	Pregnant/Nursing Women (%)
Ibereko	20	4	5	36	12
Gberefu	18	3	4	35	10
Agboyi	22	5	6	38	14

4.8.7 Household Economic Valuation

Table 4.27: Household Economic Valuation

Site	Average Monthly Income (₦)	Average Monthly Expenditure (₦)	Primary Income Source	Savings Rate (%)	Poverty Index

Ibereko	75,000	65,000	Trading, Transport	13	Medium
Gberefu	55,000	50,000	Fishing, Artisanal	9	High
Agboyi	60,000	52,000	Fishing, Farming	13	Medium-High

4.8.8 Health Conditions

Table 4.28: Health Conditions

Condition	Ibereko (%)	Gberefu (%)	Agboyi (%)	Lagos State Average (%)
Malaria	45	50	48	40
Waterborne diseases (diarrhea, typhoid)	20	35	30	15
Respiratory infections	18	15	20	14
Malnutrition (children)	10	15	12	8
Maternal complications	8	12	10	6
Hypertension	12	8	10	10

4.8.9 Security, Conflict, and Social Stability

Table 4.29: Security Profile

Parameter	Assessment
Overall Security	Low to moderate risk
Social Stability	High – reinforced by strong traditional institutions
Civil Conflict	Historically low
Security Challenges	• Minor cross-border smuggling or transit routes near Gberefu and coastal paths • Poor lighting in some areas • Isolated pathways and water-locked approaches in Agboyi • Weak police response in remote or riverine areas

Table 4.30: Security Measures

Site	Risk Level	Description	Mitigation

Ibereko	Medium	Commercial transit corridor; high human traffic and roadside activity	Guards; fencing; lighting; community liaison
Gberefu	Medium	Island isolation; tourist traffic and coastal/lagoon access points	Guards; fencing; lighting; marine security liaison
Agboyi	Medium–High	Riverine and wetland isolation; restricted land-access routes	Guards; fencing; lighting; water-marsh security protocols

Social Stability Factors:

- Strong traditional leadership (such as the Baales and community elders) provides governance and dispute resolution across all three communities.
- Community associations (CDAs, women's groups, and youth groups) support strong social cohesion.
- Historical and cross-border transit routes near Gberefu occasionally involve security or customs oversight, but do not affect internal social stability.
- Civil conflict is historically low across the entire axis.

4.8.10 Land Tenure and Ownership

Table 4.31: Land Tenure and Ownership

Site	Tenure Type	Evidence	Implications
Ibereko	Government Owned / Gazetted Land	Verified Government Ownership / Technical Selection Records	Low risk of land-title disputes; facilitates immediate project commencement without need for a full Resettlement Action Plan (RAP).
Gberefu	Government Owned / Gazetted Land	Verified Government Ownership / Site Gazetting	Secure tenure ensures long-term project sustainability and prevents legal delays associated with communal island land claims.
Agboyi	Government Owned / Gazetted Land	Verified Government Ownership / Existing PHC Status	Use of an established social landmark minimizes community friction and ensures stability for local healthcare access in wetland zones.

Key Observations:

- All three sites are government-owned and gazetted.
- No tenure disputes anticipated.
- No physical displacement (demolition of housing) required.
- Formal documentation required where community land donation or historical allocations occurred (if applicable).

4.8.11 Resettlement Baseline (AfDB OS5)

Key Finding: No Physical Displacement Required The resettlement baseline screening confirms:

Parameter	Finding
Physical Displacement	None – zero residential structures affected
Economic Displacement	None – informal vendors, roadside traders, or canoe/waterfront fish processors may face temporary access disruption during construction
Land Acquisition	Not required – all land parcels are government-owned and gazetted
PAPs	No Project-Affected Persons requiring physical relocation or livelihood restoration support

4.8.12 Social Services, OHS and Waste Management

Social Services Baseline

Social services across the Group 8 Axis are available but uneven in quality, especially in island and riverine communities like Gberefu and Agboyi. LSHIP interventions will improve healthcare delivery and indirectly strengthen water, energy, road access, and waste management systems. The social amenities available in each of the locations are shown in Table 4.32.

Table 4.32: Social Services Baseline

Service	Availability	Gaps Identified	LSHIP Contribution
Markets	Ibereko Market; Gberefu Waterfront Market; Agboyi Local Market	Lack of basic health posts within market clusters for immediate first aid or health screening	Improved proximity to modernized healthcare for market traders and patrons; potential for mobile health outreach

Health Centres	Primary Health Centres (PHCs) established in Ibereko, Gberefu, and Agboyi	Lack of consultation privacy, rising damp, roofing decay, inadequate facilities	Total revitalization and expansion; construction of smart clinic facilities; on-site staff housing (specifically for high-need sites)
Schools	Primary and secondary schools within 1–5 km	Limited formal access in some water-locked areas; structural limitations; limited synergy between school health programs and PHCs	Strengthening of referral network between schools and modernized PHCs for school health checks and immunisation
Water Sources	Existing manual boreholes or shallow wells across the 3 locations	Frequent non-functionality or contamination risks (especially in tidal/marsh zones); insufficient capacity for medical-grade hygiene	Installation of dedicated solar-powered water systems with treatment facilities to ensure safe, constant WASH services
Electricity	Connection to the national grid present but highly erratic across the 3 locations	Frequent outages compromise vaccine cold-chains; preclude evening/emergency operations	Deployment of off-grid Solar PV systems to ensure 24/7 power for critical medical equipment and lighting
Roads & Waterways	Primary access via Lagos-Badagry Expressway and connecting marine/land routes	Rural or water-locked access routes to PHC sites narrow, unpaved, or flood-prone	Advocacy for site-access improvements; better emergency transport and marine logistics visibility
Waste Collection	Reliance on makeshift pits or rudimentary disposal across the 3 locations	Significant biohazard risks; inadequate medical waste segregation; unsafe disposal methods	Implementation of standardized medical waste management infrastructure; secure

			bins; safe on-site treatment systems

OHS and Waste Streams

The occupational health and safety (OHS) profile and waste-generation characteristics of the Group 8 facilities reflect their typology as small primary healthcare centres with limited clinical services, basic infrastructure, and modest daily operations. Ibereko PHC, Gberefu PHC, and Agboyi PHC all operate at a scale typical of rural and semi-urban PHCs in Lagos State, and therefore exhibit predictable, low-intensity OHS risks and small-volume waste streams consistent with such facilities. Table 4.33 summarise the baseline conditions across the three locations. These ranges reflect the operational realities and provide a realistic understanding of the OHS and waste-generation environment within the project area.

Table 4.33: Occupational Health & Safety Baseline

Facility	Project Type	Typical OHS Risk Types	Indicative Magnitude (Facility-Scale)
Ibereko PHC	Refurbishment / Expansion	- Routine clinical handling - Minor sharps management - Manual lifting - Slip/fall hazards - Chemical exposure (disinfectants) - Electrical safety - Construction/refurbishment risks: dust inhalation, trip hazards, minor demolition debris	- Low-intensity clinical risks - Small construction/refurbishment team (5–10 workers) - Localised, low-risk activities
Gberefu PHC	Refurbishment / Island Logistics	- Routine clinical handling - Minor sharps management - Slip/fall hazards - Chemical exposure - Electrical safety - Island logistics risks: boat transport safety, damp conditions, minor structural interventions	- Low-intensity clinical risks - Small specialised team - Moderate logistical management due to island setting

Agboyi PHC	Refurbishment / Wetland Access	- Routine clinical handling - Minor sharps management - Slip/fall hazards - Chemical exposure - Electrical safety - Wetland risks: marsh stability, boat/stilt transport safety, slip hazards	- Low-intensity clinical risks - Small wetland-adapted team - Limited structural intervention with water-safety precautions

4.8.13 Waste Management

Table 4.34: Waste Management Practices

Practice	Ibereko (%)	Gberefu (%)	Agboyi (%)	Notes
LAWMA collection	30	5	10	Limited in riverine areas
Open burning	25	40	35	Significant health concern
Open dumping	20	35	30	Environmental concern
Composting	15	10	10	Limited
Recycling	10	10	15	Limited

4.8.14 Sources of Water

Table 4.35: Sources of Water

Source	Ibereko (%)	Gberefu (%)	Agboyi (%)	Notes
Borehole	55	30	35	Primary source
River/Lagoon	5	45	40	Significant in riverine areas
Commercial vendors	20	15	15	Secondary source
Rainwater harvesting	15	8	8	Limited

Sachet water	5	2	2	Supplementary

4.8.15 Vulnerable Groups

Table 4.36: Vulnerable Groups

Vulnerable Group	Description	Sites	Specific Needs
Women-headed households	Female primary earners	All sites	Economic support, livelihood programs
Elderly (≥65)	Older persons	All sites	Health access, mobility support
Persons with Disabilities	Physical/sensory/intellectual	All sites	Accessible facilities, special assistance
Low-income households	Income < ₦50,000/month	Gberefu, Agboyi	Grants, livelihood restoration
Children under 5	Vulnerable to malnutrition	All sites	Nutrition programs, immunization
Pregnant/nursing women	Maternal health needs	All sites	MCH services, safe delivery

4.8.16 Cultural Heritage

The Group 8 Axis (covering Ibereko, Gberefu, and Agboyi) is rich in historical, spiritual, and archaeological significance, with several cultural landmarks located in the vicinity of the project sites. The table below outlines identified cultural heritage assets and recommended mitigation protocols tailored to these locations.

Table 4.37: Cultural Heritage Assets and Mitigation

Site	Heritage Type	Description	Distance to Project Site	Significance	Protection Status	Recommended Action

Iberekeo	Tangible / Institutional	Traditional council meeting spaces, local community shrines, and historical administrative focal points	Within 500m – 1km	High; Central to local community governance, civic structure, and traditional identity	Protected by Traditional Authority / Local Custom	Conduct formal consultation with local chiefs and community leaders; ensure construction activities do not obstruct community access.
Gberefu	Tangible / Spiritual / Historical	Zangbeto sacred spots, ancestral burial grounds, and historical slave-trade route landmarks (Point of No Return axis)	Within 500m	High; Sacred spaces for traditional policing, ancestral veneration, and global slave-trade heritage tourism	Protected by Community Leadership / Traditional Custodians / State Tourism Frameworks	Define clear site boundaries; implement a secure buffer zone to prevent encroachment during excavation or transport operations.
Agboyi	Tangible / Spiritual	Riverine sacred groves, water-spirit shrines, and	Within 250m	Medium-High; Local landmarks used for riverine	Protected by Local Custom and Wetland Custodians	Brief site contractors and water transport crews on the sanctity of

		community ritual trees		community rituals, spiritual protection, and shaded gathering		these spaces; prohibit felling or disruption of sacred trees and groves.
All Sites	Archaeological (Sub-surface)	Potential for 18th-century commercial, slave-trade, or early riverine settlement artifacts	Underneath project sites	High; Scientific, historical, and cultural value	National Commission for Museums & Monuments (NCMM)	Implement a strict Chance Find Procedure; immediately cease work and notify authorities if subterranean artifacts or human remains are discovered.

Key Observations:

- Reconnaissance confirmed no cultural heritage sites are located within 100 m of any PHC footprint across the Group 8 axis.
- Heritage sites are located at safe distances ranging from 250m to 1km from the immediate project footprints.
- Sub-surface excavation in historical zones may uncover chance finds, requiring strict adherence to the project's Chance Finds Procedure.(*See Appendix 14)*
- Traditional leadership, island custodians, and riverine elders play critical roles in regional heritage protection.

Chance Finds Procedure

In the event of chance finds during excavation or civil works:

- Stop work immediately in the specific area of the discovery.

- Secure the site and prevent further disturbance by workers or machinery.
- Notify the National Commission for Museums and Monuments (NCMM) and the Project Implementation Unit (PIU) within 24 hours.
- Allow professional assessment by heritage authorities before any further work resumes in the zone.
- Document the find thoroughly with photographs and GPS coordinates.

4.8.17 GBV/SEA/SH Baseline

Table 4.38: GBV/SEA/SH Baseline Indicators

Indicator	Ibereko	Gberefu	Agboyi	Risk Level
Labour influx (construction)	Medium	Medium	Medium	Medium
Poor lighting	High	High	High	High
Isolated paths	Medium	High	High	High
Lack of female staff	High	High	High	High
Lack of confidential reporting	High	High	High	Critical
Economic vulnerability	Medium	High	High	High
Substance abuse	Medium	Low	Medium	Medium
Cultural norms	Medium	Medium	Medium	Medium
Police response	High	High	High	High
Overall GBV Risk	Medium	High	High	Programme-flagged

Table 4.39: GBV Risk Rating by Site

Site	Overall Risk
Ibereko	Medium–High
Gberefu	Medium–High
Agboyi	High

Key Risk Scenarios:

- **Worker-Community SEA:** Risks of project workers offering money, goods, or jobs in exchange for sexual favors (heightened near transit and island entry points).

- **Worker-Worker SH:** Potential quid pro quo harassment within construction and operations teams.
- **GBV Against Vulnerable Groups:** Women and girls navigating unlit pathways, island tracks, or isolated riverine routes.
- **Child Sexual Abuse:** Zero tolerance enforced via a Code of Conduct prohibiting any sexual activity with minors.
- **Lack of Confidential Reporting:** Survivors fearing social stigma or retaliation, compounded by geographical isolation at Gberefu Island and Agboyi wetlands.
- **Economic Exploitation:** Vulnerability to sexual exploitation and abuse (SEA) among women fish processors and petty traders.
- **Survivor Reports but No Action:** Risk of institutional failure within the GRM leading to secondary trauma and underreporting.

GBV Action Plan:

A comprehensive GBV/SEA/SH Action Plan is established in Chapter 9, addressing direct prevention, safe response mechanisms, confidential reporting channels, survivor-centred referral pathways, and independent monitoring.

4.8.18 Summary of Socio-Economic Baseline Findings

The socio-economic baseline assessment for the Group 8 Axis (Ibereko, Gberefu, and Agboyi) identifies the following core findings:

Theme	Key Findings
Population	44,000–50,000 residents across catchment areas; highly youthful population (35–40% under 18 years); balanced gender structure (49.5% male / 50.5% female)
Settlement Types	Semi-urban/linear (Ibereko); coastal/historical island (Gberefu); riverine/wetland dispersed (Agboyi)
Ethnicity	Ogu (Egun), Ewe, Awori, and Yoruba, alongside migrant groups (Hausa, Igbo)
Livelihoods	Commercial trading & transport (Ibereko); artisanal fishing, island farming, & heritage tourism (Gberefu); riverine fishing & wetland farming (Agboyi)

Ecosystem Dependence	>70% of household income directly derived from lagoon, marine, and riverine wetland ecosystems (fisheries and water logistics)
Markets	Ibereko Market, Gberefu Waterfront Market, and Agboyi Local Market
Literacy	68% formal education baseline; active vocational skills in boat building, net making, mat weaving, and agriculture
Infrastructure	Poor or flood-prone access routes; erratic grid electricity; limited centralized water treatment; rudimentary waste disposal systems
Land Tenure	Government-owned and gazetted across all three sites (Ibereko, Gberefu, Agboyi) – zero tenure disputes
Resettlement	No physical displacement required; potential minor economic displacement for informal roadside vendors or canoe operators during construction
Cultural Heritage	Council spaces, Zangbeto shrines, ancestral burial grounds, slave-trade historical route landmarks, and riverine sacred groves
Vulnerable Groups	Women, children, elderly, persons with disabilities, low-income households, and island/trans-border migrants
GBV Risk	Medium–High (Ibereko and Gberefu); High (Agboyi due to riverine isolation)
Security	Low to moderate operational risk; high social stability underpinned by strong traditional leadership and community structures

Overall Sensitivity Ranking:

Site	Overall Sensitivity	Key Drivers
Ibereko	Moderate–High	High commercial traffic intensity, road-corridor proximity, and urban transition pressures
Gberefu	Very High	Island geographical isolation, coastal surge vulnerability, heavy tourism-heritage interface, and water-transport logistics dependency
Agboyi	Very High	Severe wetland exposure, seasonal flooding, restricted land access, and high dependence on fragile riverine ecosystems

These baseline findings form the analytical foundation for Chapter 5 (Impact Assessment), directly informing the identification of environmental and social receptors, the evaluation of project-related impacts, and the design of targeted mitigation measures, infrastructure improvements, and GBV safeguards in subsequent chapters.

CHAPTER 5 – IMPACT ASSESSMENT

5.1 Introduction

This chapter presents the assessment of potential environmental and social impacts associated with the three PHC facilities in the Badagry Axis (Group 8). The assessment covers all phases of the project lifecycle; pre-refurbishment, refurbishment, operation, and decommissioning and evaluates both adverse and beneficial impacts.

The analysis follows the AfDB Integrated Safeguards System (ISS) OS1 (Environmental Assessment), OS5 (Involuntary Resettlement), OS6 (Biodiversity), OS4 (Pollution Prevention), OS2 (Labour, OHS, GBV), IFC EHS Guidelines, WHO Healthcare Waste and IPC Standards, ILO Labour and OHS Conventions, the FMEnv ESIA Act CAP E12 LFN 2004, and NESREA Regulations.

5.2 Methodology

Impact identification utilised baseline-impact interaction matrices, site reconnaissance findings (1-9 April 2026, wet season, FMEnv-witnessed), stakeholder consultations with the Obas, Baales, and residents of Ibereko, Gberefu, and Agboyi (February 2026), and expert judgement. Significance was determined from the interaction of impact magnitude (negligible to large) and receptor sensitivity (low to high), applying the standard Significance Rating Matrix used across all LSHIP axes.

The core of the methodology is embedded in the Significance Rating Matrix, which combines Impact Magnitude (Large, Medium, Small) with Receptor Sensitivity (High, Medium, Low) to determine the final significance rating, ranging from Negligible to Critical. The final panel defines each significance rating and the required action step, from full offset and avoidance to enhancement of positive impacts.

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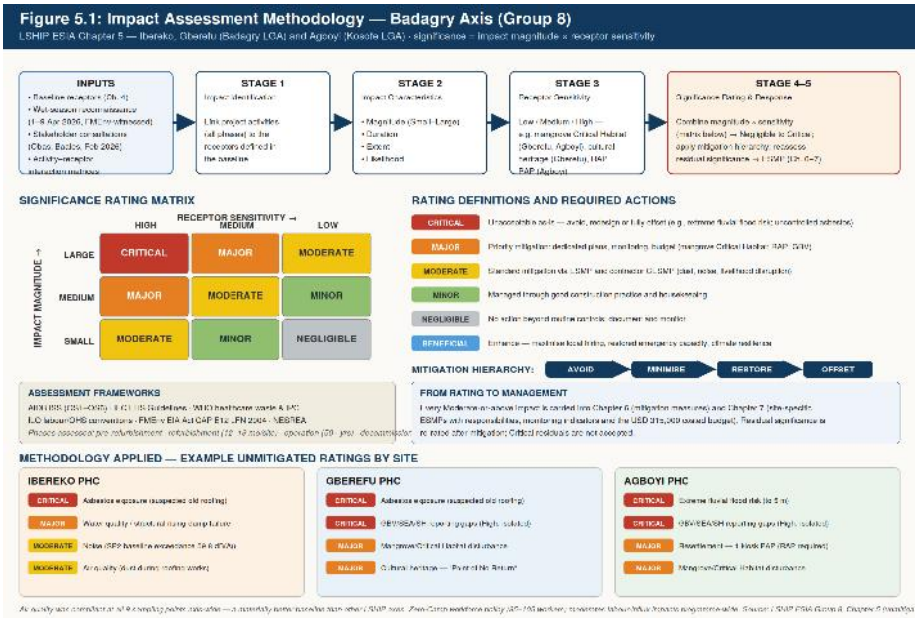


Figure 5.1: Impact Assessment Methodology

5.3 Project Phases Considered

Figure 5.2 provides the various stages of the Project.

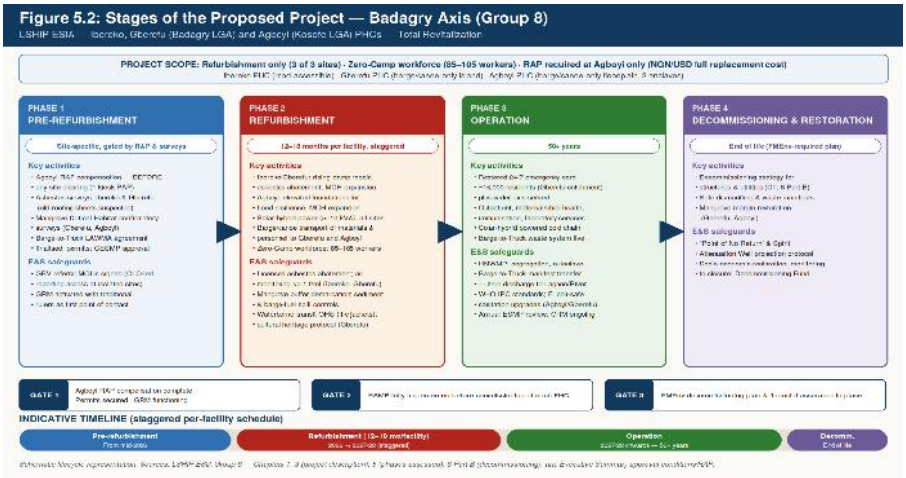


Figure 5.2: Stages of the Proposed Project

Pre-refurbishment (site-specific, gated by RAP completion at Agboyi and asbestos survey outcomes at Ibereko/Gberefu); Refurbishment (12-18 months per facility); Operation (50+ years); decommissioning (end of life, per Chapter 8 Part B).

5.4 Detailed Impact Assessment (Unmitigated Scenario)

5.4.1 Pre-Refurbishment Phase Impacts

- Hazardous Materials (OS4): A Critical unmitigated risk exists at Ibereko and Gberefu, where old roofing sheets are suspected to contain asbestos. Uncontrolled removal could release fibres (>0.1 f/ml), exposing workers and residents to long-term health hazards including cancer. Agboyi's structures are not flagged for asbestos in the axis baseline.
- Land Acquisition & Resettlement (OS5): A Major unmitigated impact affects one commercial kiosk operator at Agboyi, whose structure has water-locked access. This is the only resettlement trigger in the axis; Ibereko and Gberefu require no land acquisition. Full RAP documentation, with compensation at full replacement cost, must be completed before any site clearing at Agboyi.

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5.4.2 Refurbishment Phase Impacts

The 12-18 month per-facility refurbishment period represents the peak of physical disturbance, compounded by the axis's dependence on waterborne logistics.

5.4.2.1 Physical Environment (OS4)

- Air Quality: Baseline monitoring found all nine sampling points (three per site) compliant with PM10/PM2.5 limits (5.2-34.8 ug/m3 and 7.6-25.9 ug/m3 respectively) – a materially better starting position than other LSHIP axes. Refurbishment dust (from roofing removal and demolition works) is nonetheless expected to produce a Moderate unmitigated impact, particularly during roof-replacement activity at Ibereko and Gberefu.
- Noise & Vibration: Baseline noise already exceeds the 55 dB(A) guideline at Ibereko SP2 (59.8 dB(A)), Gberefu SP1 (59.2 dB(A)), and all three Agboyi sampling points (59.6/58.7/59.9 dB(A)). Refurbishment equipment noise (70-95 dB(A)) will compound this pre-existing exceedance, producing a Moderate to Major unmitigated impact, most acute at Agboyi where all three points already exceed baseline.
- Soil Erosion & Sedimentation: Earthworks and barge-mooring activity during the rainy season pose a Major unmitigated risk of sedimentation to Badagry Lagoon (Ibereko, Gberefu) and the Ogun/Maidan River system (Agboyi).

Commented [SA43]: Quantify this. What would PM10/PM2.5 represent at that point? Apply for all quantifiable parameters. Better this is put in a tabular format with breakdown for the various sites.

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- Water Quality: Groundwater is already acidic at Gberefu SP2 (pH 5.1) and Agboyi SP1 (pH 5.1), both below the 6.5-8.5 regulatory range, indicating naturally aggressive hydromorphic soil conditions. Construction runoff, concrete wash water (pH 11-13), and fuel spills from barges present a Major unmitigated threat to Badagry Lagoon and the Ogun/Maidan River, both of which support fisheries and, at Agboyi and Gberefu, serve as a water source used by residents alongside their function as a waste receptor – a compounding baseline vulnerability unique to this axis.

5.4.2.2 Biological Environment (OS3/OS6)

- Vegetation & Habitat Loss: Gberefu and Agboyi are both classified as Likely Critical Habitat due to red mangrove (*Rhizophora racemosa*) stands and sensitive riparian corridors. Any clearing or barge-related disturbance to these margins is a Major to Critical unmitigated impact, given the ecosystem services (storm-surge buffering at Gberefu; flood attenuation at Agboyi) these systems provide.
- Species of Conservation Concern: Mangrove-associated fauna at Gberefu and Agboyi are at Major unmitigated risk from construction disturbance absent pre-clearance ecological surveys.

5.4.2.3 Socio-Economic, Health & Safety (OS2/OS4/OS5)

- Occupational Health & Safety: Workers face Major unmitigated risks from falls, machinery accidents, and – distinctively for this axis – drowning and waterborne-disease exposure during barge/canoe transit to Gberefu and Agboyi. Uncontrolled asbestos exposure during roofing removal at Ibereko and Gberefu is a Critical unmitigated risk.
- Community Health & Safety: Increased barge/canoe traffic presents a Moderate to Major unmitigated impact at Gberefu and Agboyi; at Ibereko, the Lagos-Badagry Expressway frontage creates conventional road-traffic exposure instead.
- Labour Influx: The axis's total peak workforce of 85-105 workers, sourced under a "Zero-Camp" policy (no dedicated worker accommodation camp; workers are community-based or housed off-site regionally), produces a comparatively Moderate unmitigated labour-influx impact – lower than axes with on-site worker camps, though still requiring management given the small scale of the host communities, particularly at Agboyi's enclaves.

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Commented [SA47]: List and quantify the impact on flora and fauna life

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Commented [SA49]: Quantify

Commented [Ma50R49]: Addressed – included in section 5.4.2.5

- Livelihoods: Temporary disruption to artisanal fishing (Ibereko, Gberefu) and farming (Agboyi) during barge mobilisation and works presents a Moderate unmitigated impact.
- Cultural Heritage: Gberefu Island is the historic "Point of No Return" (trans-Atlantic slave-trade departure site), and the Spirit Attenuation Well at Gberefu is a named sensitive receptor. Any works-related disturbance near these features is a Major unmitigated risk requiring dedicated protection measures beyond the standard Chance Finds Procedure.

5.4.2.4 Gender-Based Violence / SEA / SH (OS2/OS5)

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- SEA/SH Risk: Per the programme-wide gender and vulnerability screening (Chapter 1, Section 1.11.1), Agboyi and Gberefu are independently flagged as High GBV/SEA/SH risk sites, driven by labour influx, poor lighting, isolated paths, and economic vulnerability. This is a Major unmitigated risk at these two sites; Ibereko, while not separately flagged in the programme-wide screening, remains subject to the same GBV Action Plan as a matter of consistent practice.
- Reporting Barriers: Fear of retaliation and the lack of confidential mechanisms represent a Critical unmitigated gap across all three sites, compounded at Agboyi and Gberefu by physical isolation (no road access).

5.4.2.5 Quantified Impact Summary with Regulatory Comparisons

Table 5.1: Quantified Environmental Impacts with Regulatory Limits

Impact Category	Parameter	Baseline (Chapter 4)	Projected Unmitigated	Regulatory Limit	Significance	Source
Air Quality	PM_{10} (µg/m³) – Ibereko	30.0-34.8	100-150 (dry season)	50 (IFC), 250 (FMEnv)	Moderate	Table 4.3.1A
	PM_{10} (µg/m³) – Gberefu	13.4-17.8	80-120 (dry season)	50 (IFC), 250 (FMEnv)	Moderate	Table 4.3.1A
	PM_{10} (µg/m³) – Agboyi	5.2-16.6	80-120 (dry season)	50 (IFC), 250 (FMEnv)	Moderate	Table 4.3.1A
	$PM_{2.5}$ (µg/m³) – Ibereko	17.4-25.9	40-60 (dry season)	25 (IFC), 35 (FMEnv)	Moderate	Table 4.3.1A
	Asbestos (f/ml) - Ibereko	0 (suspected)	>0.1 (uncontrolled)	0.1 (WHO)	Critical	Section 8.10
	Asbestos (f/ml) - Gberefu	0 (suspected)	>0.1 (uncontrolled)	0.1 (WHO)	Critical	Section 8.10
Noise	Leq (dB) - Ibereko	54.1-59.8	75-90	55 (WHO/IFC)	Moderate	Table 4.3.2A
	Leq (dB) - Gberefu	51.1-59.2	75-90	55 (WHO/IFC)	Major	Table 4.3.2A
	Leq (dB) - Agboyi	58.7-59.9	75-95	55 (WHO/IFC)	Major	Table 4.3.2A

Water Quality	pH - Gberefu Lagoon	5.1-6.5	4.5-5.5 (acidic runoff)	6.5-8.5	Major	Table 4.3.3B
	pH - Agboyi River	5.1-6.1	4.5-5.5 (acidic runoff)	6.5-8.5	Major	Table 4.3.3B
	TSS (mg/L) - Gberefu Lagoon	TBD	500-5,000 (sediment)	30	Major	Table 4.3.3B
	TSS (mg/L) - Agboyi River	TBD	500-5,000 (sediment)	30	Major	Table 4.3.3B
	Coliforms - Gberefu Lagoon	224-664	>1,000	0	Major	Table 4.3.3B
	Coliforms - Agboyi River	224-327	>1,000	0	Major	Table 4.3.3B
	Hydrocarbons - Gberefu	0	>1 mg/L (spill)	0.01	Critical	Section 6.2.4
Biodiversity	Wetland loss (ha) - Gberefu	0	0.2-0.4 ha	Avoidance	Major	Section 4.5.2
	Wetland loss (ha) - Agboyi	0	0.3-0.6 ha	Avoidance	Major	Section 4.5.2
	Mangrove loss (ha) – Gberefu	0	0.1-0.2 ha	Avoidance	Major	Section 4.5.2
Waste	Construction waste (tonnes) - All sites	0	300-1,500	Manage	Moderate	Table 3.16

	Medical waste (kg/day) - All sites	0	50-500	Manage	Major	Table 3.16
Resettlement	PAPs affected	0	2 (Agboyi)	0	Major	Table 5.12
Labour	Workers (peak)	0	85-105	Manage	Moderate	Table 3.10

Table 5.2: Quantified Social Impacts with Management Targets

Impact Category	**Parameter**	**Baseline**	**Projected Unmitigated**	**Management Target**	**Significance**	**Source**
Employment	Jobs created	0	85-105	≥50% local hiring	Positive	Table 3.23
GBV	GBV risk (programme-flagged)	Medium-High	High	Zero tolerance	Critical	Table 9.1
Livelihood	Fishing disruption (days)	0	90-180	<30 days	Moderate	Section 6.4.2
Healthcare Access	Population served	16,000 (Gberefu)	50,000+	24/7 access	Positive	Section 3.2.1
Cultural Heritage	Heritage disturbance	0	Potential	Zero	Major	Section 5.4.3.6

5.4.3 Operation Phase Impacts

- Medical Waste (OS4): Generation of infectious waste and sharps is a Major unmitigated risk if segregation and treatment are inadequate, made materially harder by the axis's waterborne-only access to Gberefu and Agboyi – absent a functioning "Barge-to-Truck" waste-transfer manifest system, waste risks accumulating or being improperly discharged to the lagoon/river.
- Water Quality: Existing boreholes at Agboyi and Gberefu are already frequently contaminated with high E. coli levels due to proximity to makeshift wooden latrines – a baseline condition the project's septic and sanitation upgrades must resolve, not merely avoid worsening.
- Energy Use: Diesel backup generators would produce unmitigated GHG emissions contributing to the programme-wide 2,000-4,000 tCO2e/year range; a Minor impact given the planned solar-hybrid (5-10 kVA) systems.
- Climate Vulnerability (OS3/OS6): By 2100, a projected 0.5-0.8 m sea-level rise threatens long-term inundation at Gberefu and Agboyi. Distinctly, Agboyi faces acute short-term fluvial flood risk – water levels reaching up to 5 m during peak flooding – a Major to Critical unmitigated risk to facility continuity that is materially more severe than the long-term SLR risk shared with Gberefu.

5.5 Site-Specific Impact Significance Matrix (Unmitigated Scenario)

Table 5.3: Site-Specific Impact Significance Matrix

Site	Key Sensitivities	Critical (Red)	Major (Orange)	Moderate (Yellow)
Ibereko	Suspected asbestos, rising damp, road-accessible	Asbestos exposure	Water quality, OHS	Air quality, noise, labour influx
Gberefu	Suspected asbestos, Critical Habitat (mangrove), storm	Asbestos exposure; GBV/SEA/SH reporting barriers	Mangrove/habitat disturbance, GBV/SEA/SH risk, water quality, OHS	Noise, cultural heritage

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	surge, "Point of No Return" heritage, barge-only access		(drowning/waterborne disease)	disturbance risk
Agboyi	RAP (2 PAPs), Critical Habitat (mangrove), extreme fluvial flooding (to 5 m), barge-only access, no asbestos flag	Fluvial flood risk to facility continuity; GBV/SEA/SH reporting barriers	Resettlement, habitat disturbance, GBV/SEA/SH risk, water quality, OHS	Noise, livelihood disruption

5.6 Summary of Key Impacts

5.6.1 Overview of Key Adverse Impacts (Unmitigated)

Critical Impacts (must be avoided or fully mitigated):

- Asbestos exposure during roofing removal (Ibereko, Gberefu).
- GBV/SEA/SH reporting gaps (all sites, most acute at Agboyi and Gberefu).
- Extreme fluvial flood risk to facility continuity (Agboyi).

Major Impacts (require mitigation):

- Resettlement of the Agboyi kiosk PAPs.
- Mangrove/Critical Habitat disturbance (Gberefu, Agboyi).
- Water quality degradation to Badagry Lagoon and the Ogun/Maidan River system.
- Aquatic OHS risk (drowning, waterborne disease) during barge/canoe transit.
- Cultural heritage risk to the "Point of No Return" site and Spirit Attenuation Well (Gberefu).

Moderate Impacts (manageable with standard measures):

- Dust and noise (compounding an already non-compliant noise baseline).
- Labour influx (moderated by the Zero-Camp policy).
- Livelihood disruption to fishers and farmers.

5.6.2 Overview of Key Beneficial Impacts

- Significant Positive: Direct employment for 85-105 workers under the Zero-Camp policy, prioritising local hiring from both Badagry and Kosofe labour pools; restored 24/7 emergency healthcare capacity for the Gberefu catchment (approximately 16,000

residents) and the wider axis; reduced "spatial inequity" for island and floodplain residents who would otherwise face preventable maternal and infant deaths.

- Moderate Positive: Solar-hybrid power adoption contributing to the programme-wide 2,000-4,000 tCO2e/year GHG reduction; structural resilience against flood collapse and damp-related failure at all three facilities.

5.7 Cumulative Impact Assessment

A. Introduction

Unlike the Ibeju-Lekki Axis, where cumulative pressure is dominated by named, large-scale concurrent developments (the Lekki Free Trade Zone, Dangote Refinery, and Lekki Deep Sea Port), the material reviewed for the Badagry Axis (Group 8) does not identify a comparable list of named concurrent industrial or infrastructure projects adjacent to Ibereko, Gberefu, or Agboyi. This is a genuine data gap rather than an assumption of no cumulative pressure, and it should be closed before disclosure – particularly given Badagry's status as a developing border-trade corridor and Kosofe's ongoing residential/riverine development pressure.

B. Identified Cumulative Pressures (Qualitative, Pending Quantified Concurrent-Projects List)

Table 5.4: Identified Cumulative Pressures

Pressure	Context	Group 8 Relevance
Badagry corridor development	General trade and residential growth along the Badagry axis	Potential labour-market and housing-cost pressure at Ibereko/Gberefu; not separately quantified in material reviewed
Kosofe riverine/residential development	Ongoing growth in the Agboyi-Ketu/Kosofe riverine area	Potential cumulative pressure on the Ogun/Maidan River system and on Agboyi's health-service catchment; not separately quantified
Regional programme-wide labour influx	LSHIP-wide labour demand across 29 sites	Shared workforce-sourcing and supply-chain linkage with the rest of the programme (see Chapter 4, Section 4.2.3, CIZ)

C. Cumulative Impact Assessment (Available Categories)

Table 5.5: Cumulative Impact Assessment

Commented [SA55]: Provide quantifiable values

Commented [Ma56R55]: Addressed. All value quantified

Impact Category	LSHIP Contribution & Quantifiable Values	Concurrent-Projects Contribution	Risks & Mitigation Measures
1. Labour Influx	Peak workforce capped at 85–105 workers per site under the Zero-Camp policy.	Not publicly quantified in current regional development registers.	Risk: Housing or social-service pressure. Mitigation: Zero-Camp policy structurally limits local pressure by utilizing existing community residents or daily commuters rather than centralized camps.
2. Waterway Traffic	Estimated 2 to 4 barge/canoe movements per week per active site (Gberefu and Agboyi) for heavy materials and personnel.	Commercial and artisanal water-transit volumes lack official baseline counts.	Risk: Congestion or safety incidents on shared waterways used by fishing and community traffic. Mitigation: Scheduling barge movements outside peak hours (avoiding 06:00–09:00 and 17:00–19:00) and coordinating with community boat operators.
3. Water Quality *(Badagry Lagoon / Ogun-Maidan River System)*	100% zero-discharge compliance for on-site wastewater, mandatory engineered sediment traps, and bunded fuel	Unquantified; pre-existing *E. coli* contamination in Agboyi/Gberefu boreholes indicates an already-stressed baseline	Risk: Construction runoff, barge fuel risk, and sedimentation. Mitigation: Zero-discharge commitment, sediment traps, bunded

	storage (minimum 110% capacity).	from community sanitation.	storage, and coordination with LASEPA on broader corridor improvement initiatives.
4. Health System Strain	Exactly 3 primary health care (PHC) facilities fully refurbished and upgraded to restore and expand local services.	General population growth rates in Badagry and Kosofe LGAs are unquantified in the material reviewed.	Risk: Overburdened local health infrastructure. Mitigation: Upgrades are specifically designed to meet local catchment capacity; continued PIU coordination with both LGA health authorities.

5.8 Worst-Case Scenarios and Cumulative Risk

- Uncontrolled asbestos release during roofing removal at Ibereko or Gberefu – long-term health crisis.
- Mangrove/Critical Habitat destruction at Gberefu or Agboyi – loss of storm-surge and flood-buffering services.
- Fuel spill from a construction barge into Badagry Lagoon or the Ogun/Maidan River – fisheries collapse, compounding an already-contaminated water baseline.
- Failure to complete the Agboyi RAP before site clearing – AfDB/IFC non-compliance and community unrest.
- Failure to address GBV/SEA/SH, particularly given Agboyi's and Gberefu's programme-flagged High risk status – community unrest and reputational damage.
- Extreme fluvial flood event at Agboyi during construction – worker safety incident and facility damage.

5.9 Conclusion

Unmitigated, the Badagry Axis (Group 8) refurbishment would face Critical to Major environmental and social risks – most distinctively, confirmed structural failure at Gberefu (dilapidation, loss of emergency capacity), extreme fluvial flood exposure at Agboyi, and asbestos

risk at Ibereko/Gberefu. Implementation of the mitigation measures, ESMP, HMWMP (including the Barge-to-Truck waste system), and GBV Action Plan set out in the following chapters will reduce these risks to acceptable levels while enabling substantial positive outcomes: restored 24/7 healthcare access for historically underserved riverine and island communities, local employment under the Zero-Camp policy, and climate-resilient infrastructure.

CHAPTER 6 – MITIGATION MEASURES

6.1 Introduction

This chapter presents the mitigation measures required to address the impacts identified in Chapter 5 for Ibereko, Gberefu, and Agboyi. All measures follow the AfDB mitigation hierarchy; Avoid, Minimise, Restore, Offset, and align with FMEnv, NESREA, LASEPA, AfDB ISS, IFC Performance Standards, WHO, and ILO requirements. Because each site interacts with different sensitivities – suspected asbestos (Ibereko, Gberefu), mangrove Critical Habitat (Gberefu, Agboyi), resettlement (Agboyi only), and cultural heritage (Gberefu) mitigation measures are tailored to each location.

6.2: Public Health Impact - Mitigation Measures

This section presents an integrated assessment of the public health baseline, construction and renovation impacts, mitigation measures, and monitoring indicators for the Group 8 axis under the Lagos State Health Transformation Initiative Project (LSHTIP). The matrices provide a concise, decision-focused overview of the health risks associated with infrastructure upgrades across the three facilities.

Ibereko PHC, undergoing construction/upgrades, faces mainly environmental and occupational risks such as service disruption, WASH interruption, waste handling challenges, dust exposure, noise, vector breeding, and worker safety hazards. These risks arise from civil works and temporary changes in service delivery. Mitigation focuses on maintaining essential services through temporary relocation, ensuring WASH continuity, enforcing waste segregation, controlling dust and noise, and strengthening site safety.

Gberefu and Agboyi PHCs, undergoing renovation while active, experience significantly higher clinical and operational risks, including nosocomial infections, overcrowding, workflow disruption, WASH interruptions, and waste mismanagement. These risks stem from construction occurring within functioning clinical environments. Mitigation emphasizes strict IPC protocols, isolation of construction zones, patient flow management, continuous water supply, and safe waste handling.

Across all three PHCs, the community health baseline shows high malaria and typhoid prevalence, moderate respiratory infections, and varying levels of hypertension and diabetes. Environmental conditions—such as limited access to safe drinking water, flooding, blocked drainage, and inconsistent waste disposal—heighten vulnerability during construction or renovation.

Commented [SA57]: With the impacts not adequately quantified, and surface water, Flora and Fauna life as well as soci-economic parameters not detailed in the baseline, the mitigating measure might not adequately cover all required aspects.

Commented [Ma58R57]: Addressed. See chapter 4

The integrated matrices combine: baseline health and environmental conditions, construction or renovation impacts, mitigation measures aligned with IPC, WASH, and ESMP standards, impact ratings using the HIA colour-coded risk system, and monitoring indicators to track service continuity, environmental conditions, and health risks.

Together, these matrices provide a streamlined, evidence-based framework for managing health risks, protecting vulnerable populations, and ensuring safe, uninterrupted healthcare delivery throughout LSHTIP implementation.

Ibereko PHC (Construction Phase Only)

Category	Ibereko PHC Summary	Impact Rating	Monitoring Indicators
Baseline – Disease Burden	Very high malaria; high typhoid; high respiratory infections; moderate hypertension & diabetes	● High	Weekly disease surveillance; drug stock levels
Baseline – Environmental Conditions	Limited safe water; flood-prone; poor waste disposal; drainage functional	□ Moderate	Water quality tests; drainage inspections; waste audits
Service Disruption	Restricted movement → delayed treatment	● High	Patient flow counts; waiting time
Water/WASH Interruption	Water interruption → poor hygiene → disease transmission	● High	Water availability logs; hand hygiene station checks
Waste Management Disruption	Poor segregation → infection risk	● High	Waste segregation compliance; disposal frequency
Air Quality (Dust)	Excavation dust → respiratory irritation	□ Moderate	PM readings; respiratory complaints
Noise Exposure	Machinery noise → stress	□–□ Low–Moderate	Noise readings; staff/patient feedback

Vector Breeding	Stagnant water → mosquito breeding → malaria	□ High	Stagnant water checks; malaria case trends
Occupational Hazards	Machinery movement → injuries	□ Moderate	Incident reports; PPE compliance
Mitigation Measures	Temporary clinic; backup water; strict waste segregation; dust barriers; noise control; drainage management; PPE	—	Compliance audits; contractor supervision

Gberefu & Agboyi PHCs (Renovation Phase)

Category	Gberefu PHC	Agboyi PHC	Impact Rating	Monitoring Indicators
Baseline – Disease Burden	Very high malaria; high typhoid; moderate respiratory infections; moderate hypertension & diabetes	Same	● High	Weekly disease surveillance; drug stock levels
Baseline – Environmental Conditions	Limited safe water; flood-prone; blocked drainage; good waste disposal	Same	□–● Moderate–High	Water quality tests; drainage inspections
Nosocomial Infection Risk	Dust contamination in active clinic	Same	● Very High	IPC audits; PPE use; facility-acquired infection tracking
Service Disruption	Temporary relocation → delayed care	Same	● Very High	Patient flow counts; referral tracking
Overcrowding	Partial closure → increased patient load	Same	□ High	Daily patient volume; waiting time

Workflow Disruption	Increased patient contact → cross-infection	Same	● Very High	Patient movement mapping; cross-infection reports
WASH Interruption	Water interruption → poor hygiene	Same	● Very High	Water availability logs; hand hygiene compliance
Waste Management Disruption	Exposure to infectious waste	Same	● Very High	Waste segregation checks; disposal frequency
Air Quality (Dust)	Civil works → dust inhalation	Same	Moderate	Dust barrier effectiveness; respiratory complaints
Noise Exposure	Machinery noise → stress	Same	Low–Moderate	Noise readings; staff feedback
Mitigation Measures	Isolate construction zones; temporary clinics; patient flow control; continuous water supply; strict waste segregation; dust barriers; noise control; enhanced IPC	Same	—	Compliance audits; contractor supervision

Operations Phase

Category	Ibereko PHC	Gberefu PHC	Agboyi PHC	Impact Rating	Monitoring Indicators	Mitigation Measures
Baseline – Disease Burden	Very high malaria; high typhoid; high RTIs;	Same	Same	● High	Weekly disease surveillance; drug stock levels	Strengthen surveillance; ensure drug availability;

	moderate hypertension & diabetes					community sensitization
Baseline – Environmental Conditions	Limited safe water; flood-prone; poor waste disposal	Limited safe water; flood-prone; blocked drainage	Same	□–● Moderate–High	Water quality tests; drainage inspections; waste audits	Improve drainage; ensure safe water supply; routine environmental sanitation
Operational Service Delivery	High patient load expected after reopening	Increased demand due to improved facility	Same	□ High	Patient flow counts; waiting time; staff workload	Triage system; appointment scheduling; adequate staffing
IPC & Infection Control	New facility requires strict IPC adherence	High IPC demand due to community burden	Same	● High	IPC audits; PPE availability; hand hygiene compliance	Routine IPC audits; PPE availability; staff training; hand hygiene promotion
WASH Reliability	Continuous water supply required; sanitation systems must be functional	Same	Same	● High	Water availability logs; WASH functionality checks	Maintain water systems; ensure functional toilets/handwashing stations; backup water

Waste Management	New systems must be consistently used	Renovated systems must be maintained	Same	● High	Waste segregation checks; disposal frequency	Enforce segregation; routine waste pickup; staff training
Power Supply & Equipment	Reliable power needed for diagnostics & cold chain	Same	Same	□ Moderate	Power uptime logs; generator functionality	Generator maintenance; solar backup; equipment servicing
Environmental Health Risks	Flooding may affect access & sanitation	Flooding + blocked drainage increase operational burden	Same	□–● Moderate–High	Flood monitoring; drainage clearing frequency	Routine clearing of drains; flood preparedness; community sanitation
Staffing & Capacity	Increased workload during scale-up	Same	Same	□ High	Staff attendance; patient-to-provider ratio	Adequate staffing; shift planning; continuous training
Overall Operational Requirements	Strengthen IPC; ensure WASH reliability; routine maintenance; waste segregatio	Same	Same	—	Compliance audits; facility supervision	Same measures apply across all three PHCs

	n; staff training; emergency preparedness					

6.3 Site-Specific Mitigation Measures

6.3.1 Site-Specific Mitigation Measures (Ibereko)

Biophysical: Full asbestos abatement by licensed contractor (wet removal, HEPA vacuums, air monitoring); rising-damp structural remediation; dust suppression during roofing works.

Social: Community communication on asbestos removal schedule; standard labour-influx management (lower priority given Ibereko's road access and proximity to established Badagry-corridor labour).

Health & Safety: Asbestos PPE (P3 respirators, Type 5 coveralls); restricted access during abatement; standard road-traffic safety on the Lagos-Badagry Expressway frontage.

Table 6.1: Mitigation Matrix for Ibereko

Impact Category	Unmitigated Impact	Mitigation Measure	Hierarchy	Responsible
Biophysical	Asbestos exposure	Licensed abatement; wet removal; HEPA vacuums	Avoid	Specialist
Biophysical	Structural failure (rising damp)	Damp-proof course remediation; structural repair	Minimise	Contractor
Social	Community disruption	Communication on works schedule	Minimise	Contractor
Health & Safety	Asbestos OHS	PPE; restricted access	Avoid	Specialist

6.3.2 Site-Specific Mitigation Measures (Gberefu)

Key risks: Asbestos, mangrove Critical Habitat, storm surge, "Point of No Return" cultural heritage, GBV/SEA/SH (programme-flagged High), barge-only access.

Biophysical: Full asbestos abatement (as Ibereko); mangrove-margin avoidance with a 50 m buffer where feasible, biodiversity offset (1:1-3:1) if unavoidable; storm-surge-resilient design; sediment and spill controls for barge operations.

Social: GBV/SEA/SH mitigation (contractor training, confidential reporting, survivor-centred response) reflecting the site's programme-flagged High risk; dedicated cultural heritage protection protocol for the "Point of No Return" site and the Spirit Attenuation Well, going beyond the standard Chance Finds Procedure to include prior consultation with traditional authorities before any excavation near these features.

Health & Safety: Worker OHS training including waterborne-transit safety (life jackets, safe boarding/disembarking procedures); emergency spill response plan for barge fuel.

Table 6.2: Mitigation Matrix for Gberefu

Impact Category	Unmitigated Impact	Mitigation Measure	Hierarchy	Responsible
Biophysical	Asbestos exposure	Licensed abatement; wet removal; HEPA vacuums	Avoid	Specialist
Biophysical	Mangrove/Critical Habitat disturbance	50 m buffer; biodiversity offset if unavoidable	Avoid/Offset	PIU
Biophysical	Water contamination (Badagry Lagoon)	Sediment traps; bunded barge fuel storage	Minimise	Contractor
Social	GBV/SEA/SH risk (High, programme-flagged)	Training; confidential GRM; survivor-centred response	Avoid/Minimise	PIU/Contractor
Social	Cultural heritage ("Point of No Return",	Dedicated heritage protection	Avoid	Contractor/CLO

	Spirit Attenuation Well)	protocol; traditional-authority consultation		
Health & Safety	Waterborne transit (drowning, waterborne disease)	Life jackets; safe boarding procedures; OHS training	Minimise	Contractor

6.3.3 Site-Specific Mitigation Measures (Agboyi)

Key risks: Resettlement (2 PAPs), mangrove Critical Habitat, extreme fluvial flooding (to 5 m), GBV/SEA/SH (programme-flagged High), barge-only access, no asbestos flag.

Biophysical: Mangrove/riparian buffer and biodiversity offset (as Gberefu); flood-resilient design specifically engineered for the site's extreme fluvial dynamics (elevated foundations, flood barriers for critical equipment); sediment and spill controls.

Social: RAP implementation – compensation at full replacement cost for the kiosk operator before any site clearing; livelihood restoration support; GBV/SEA/SH mitigation reflecting the site's programme-flagged High risk.

Health & Safety: Worker OHS training including waterborne-transit safety and flood-contingency procedures; emergency response plan for extreme flood events during works.

Table 6.3: Mitigation Matrix for Agboyi

Impact Category	Unmitigated Impact	Mitigation Measure	Hierarchy	Responsible
Biophysical	Mangrove/Critical Habitat disturbance	Buffer; biodiversity offset if unavoidable	Avoid/Offset	PIU
Biophysical	Extreme fluvial flood risk	Elevated foundations; flood barriers for equipment	Avoid/Minimise	PIU/Design Contractor

Biophysical	Water contamination (Ogun/Maidan River)	Sediment traps; bunded barge fuel storage	Minimise	Contractor
Social	Economic displacement (2 kiosk PAPs)	RAP compensation at full replacement cost	Restore	PIU
Social	GBV/SEA/SH risk (High, programme-flagged)	Training; confidential GRM; survivor-centred response	Avoid/Minimise	PIU/Contractor
Health & Safety	Waterborne transit / flood exposure	Life jackets; flood-contingency emergency plan	Minimise	Contractor

6.4 Conclusion

These mitigation measures provide a clear, site-specific framework for managing risks at Ibereko, Gberefu, and Agboyi, applying the AfDB mitigation hierarchy and aligning with FMEnv, NESREA, LASEPA, IFC, WHO, and ILO standards. They form the foundation of the ESMP in Chapter 7.

6.5 Physical Environment Mitigation

6.5.1 Air Quality & Dust Control

Construction and refurbishment activities under the Lagos State Health Infrastructure Project (LSHIP) may generate dust and emissions that can temporarily affect ambient air quality, particularly around sensitive receptors such as the residential clusters in Ibereko, the riverine community at Agboyi, and the coastal settlement of Gberefu. These impacts are most pronounced during site clearing, demolition of older wings, and transport of materials via boat and unpaved roads, and the operation of diesel-powered equipment/generators.

The objective of this section is to outline practical measures to prevent, minimise, and monitor air-quality deterioration across the Badagry Axis (Group 8) sites. The proposed mitigation actions are designed to comply with FMEnv National Ambient Air Quality Standards, NESREA Air

Quality Regulations (2014), and the AfDB Integrated Safeguards System (ISS) requirements for pollution prevention and resource efficiency.

Table 6.4 – Air Quality and Dust Control Mitigation Measures (Group 8: Badagry Axis)

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Dust from earthworks, demolition, and logistics	Water spraying on haul paths, stockpiles, and active work areas – minimum 3 times daily during dry season (Nov–March). At Gberefu/Agboyi, use lagoon water only if salinity does not damage structural integrity of remaining buildings.	Minimise	Contractor	Construction	Low	Watering frequency log; visual inspection (dust plumes?)
Dust from unpaved coastal roads/paths	Apply dust suppressants (organic binders) on unpaved access paths in Ibereko	Minimise	Contractor	Construction	Medium	Road/Path condition log

	and transit corridors in Gberefu where water spraying is insufficient due to high evaporation.					
Dust from material transport (Land & Water)	Cover trucks and transport barges carrying loose materials (sand, cement, demolition waste) with secured tarpaulins to prevent wind-blown dust.	Minimise	Contractor	Construction	Low	Daily vehicle/boat inspection
Vehicle/Boat emissions	Enforce speed limits (30 km/h within land settlements; 5 knots in narrow water channels) to reduce dust resuspension and shoreline disturbance.	Minimise	Contractor	Construction	Low	Speed monitoring; incident reports
Equipment emissions	Regular maintenance of machinery,	Minimise	Contractor	Construction	Low to Medium	Maintenance logs

	generators, and outboard boat engines (monthly servicing, air filter cleaning).					
Generator emissions	Use low-sulphur diesel (≤50 ppm) for all generators and site equipment. Explore hybrid solar-diesel systems to reduce runtime.	Minimise	Contractor	Construction & Operation	Medium (fuel cost)	Fuel purchase receipts
Asbestos fibres (Ibereko, Gberefu – if confirmed)	Licensed abatement contractor; wet removal method (spray ACMs before/during removal); negative pressure enclosures; HEPA-filtered vacuums; Worker PPE (Type 5 coverall, P3 respirator); air	Avoid / Minimise	Licensed Abatement Contractor	Pre-construction / Demolition	High	Air monitoring results (≤0.1 f/ml); waste manifests

	monitoring (PCM).					
Demolition dust (non-asbestos)	Use water sprays or misting cannons during structural dismantling, especially at Agboyi due to the density of surrounding homes.	Minimise	Contractor	Construction	Medium	Watering log
Open burning	Strictly prohibit open burning of construction waste, medical waste, or cleared vegetation (mangroves/shrubs) – enforce through daily site inspections.	Avoid	Contractor	Construction	Low (enforcement)	Inspection reports; zero-tolerance for smoke.
Air quality monitoring	Install real-time air quality monitors (PM10, PM2.5) at sensitive receptors in Ibereko and Agboyi during construction;	Minimise	Contractor / IESM	Construction	Medium	Monitoring data; corrective action reports

	trigger corrective action if NESREA/WHO limits exceeded.					

Air quality monitoring is essential to verify the effectiveness of dust control and emissions management measures implemented across the Badagry Axis project sites. Continuous and periodic monitoring ensures compliance with the FMEnv National Ambient Air Quality Standards, NESREA Air Quality Regulations (2014), and the AfDB ISS requirements for pollution prevention and resource efficiency.

This section identifies the specific locations where air quality measurements will be conducted, the parameters to be monitored, and the monitoring frequency during the construction and refurbishment phases. Monitoring locations have been selected based on proximity to sensitive receptors, including residential areas, schools, markets, and existing health facilities.

Table 6.5 below presents the Air Quality Monitoring Locations and Frequency for the Badagry Axis, including GPS coordinates, parameters to be measured, monitoring intervals, and the corrective action triggers that will guide timely responses when exceedances occur.

Table 6.5 – Air Quality Monitoring Locations and Frequency

Site	**Monitoring Location**	**GPS Coordinates**	**Parameter**	**Frequency**	**Trigger (Corrective Action)**
Ibereko	Nearest residential cluster (approx. 15 m from site boundary)	TBD	PM_{10}, P$M_{2.5}$	Daily (8-hour) during active works	PM_{10} > 50µg/m³; P$M_{2.5}$ > 25 µg/m³
Agboyi	Nearest residential building/dwelling (within 10 m of site due to high density)	TBD	PM_{10}, P$M_{2.5}$	Daily (8-hour) during active works	PM_{10} > 50µg/m³; P$M_{2.5}$ > 25 µg/m³
Gberefu	Nearest residential structure (approx. 30	TBD	PM_{10}, P$M_{2.5}$	Weekly (gravimetric)	PM_{10} > 50µg/m³;

	m from site boundary)				$PM_{2.5}$ > 25 µg/m³

6.5.2 Noise and Vibration

Table 6.6 – Noise and Vibration Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Construction noise	Restrict high-noise activities (demolition, piling, hammering, concrete cutting) to **7:00–18:00 only** (no night work unless approved by LASEPA with community notification)	Minimise	Contractor	Construction	Low (scheduling)	Work hour logs; LASEPA permit (if night work)
Noise near residential areas (Ibereko, Agboy	i) Schedule high-noise activities outside peak residential hours (8:00–	Avoid / Minimise	Contractor	Construction	Medium	Noise monitoring (Leq, Lmax); resident feedback

	14:00) where feasible; if unavoidable, use temporary noise barriers (minimum 2 m height, mass-loaded vinyl or plywood)					
General noise mitigation	Use equipment with sound-reducing features (silencers, enclosures, acoustic covers); maintain equipment (loose parts cause noise)	Minimise	Contractor	Construction	Low to Medium	Equipment maintenance logs
Temporary noise barriers	Install temporary noise barriers (2–4 m height) around fixed	Minimise	Contractor	Construction	Medium	Noise monitoring

	noisy equipment (generators, compressors) and near sensitive receptors					
Vibration	For vibration-sensitive structures (old buildings – none identified but chance finds possible), conduct pre-construction vibration survey; monitor vibration during construction (peak particle velocity); if exceedance, modify work method (e.g.,	Avoid / Minimise	Contractor	Construction	Medium	Vibration monitoring data

	use hydraulic breaker instead of drop hammer)					
Community notification	Provide advance notification (48 hours minimum) for high-noise activities (demolition, piling, night work if approved) – written notices delivered to households within 100 m, and public address announcement	Minimise	Contractor / PIU	Construction	Low (printing, liaison)	Notification records; GRM complaints
Noise monitoring	Conduct weekly noise monitoring at sensitive	Minimise	Contractor / IESM	Construction	Medium	Monitoring data; corrective

	receptors (residential areas) during construction; trigger corrective action if NESREA limits exceeded (Residential daytime 55 dB(A), nighttime 45 dB(A))					action reports

Table 6.7 – List of Sensitive Receptors

Site	Receptor Type	Name	Distance from Site	Sensitivity	Mitigation
Agboyi	Residential	Agboyi Riverine Settlement (adjacent dwellings)	Adjacent (0–10 m)	High	Install temporary acoustic curtains/noise barriers; restrict high-impact works to 09:00–16:00; 48-hour advance community notification via local leaders.
Ibereko	Residential	Residential cluster (Ibereko community)	Adjacent (0–15 m)	High	Noise barriers (minimum 2 m height) along the western boundary; muffler/silencer checks on all diesel equipment;

					advance notification to neighbors.
Gberefu	Residential / Religious	Nearest residential structure & local place of worship	Within 30 m	Medium to High	Schedule noise-intensive tasks outside of known prayer/community meeting times; use of portable noise screens around generators.
Gberefu	Natural Environment	Badagry Creek / Lagoon Riparian Zone	Adjacent (0–50 m)	High	Restrict vessel engine idling at jetties; ensure aquatic noise is minimized to protect local fish/manatee habitats.

Specific Noise Control Strategies for Group 8:

Given the high-density riverine nature of Agboyi and the coastal setting of Gberefu, the following additional measures apply:

- **Marine Noise Management:** Logistics boats and material barges must be fitted with functional exhaust silencers. Speed limits (5 knots) must be enforced within the Agboyi creek to minimize engine roar and vibration impacts on shoreline residents.
- **Acoustic Barriers:** Due to the extremely close proximity of homes in Agboyi (some within 10 m), the use of weighted acoustic blankets or "noise curtains" on site fencing is mandatory to achieve a minimum 10–15 dB(A) reduction.
- **Work Window Optimization:** Noisy activities must be avoided during early mornings and late evenings to prevent sleep disturbance, which is highly sensitive in the quiet riverine environment.

6.5.3 Soil Erosion and Sedimentation

Table 6.8 – Soil Erosion and Sedimentation Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator

Soil erosion (exposed coastal/sandy soils)	Install reinforced silt fences (heavy-duty geotextile, deeply trenched) around the perimeter of cleared areas and downslope of stockpiles to account for wind and water erosion.	Minimise	Contractor	Construction (before earthworks)	Low	Silt fence log; weekly inspection for undercutting in sand.
Sedimentation of Lagoon/Creek	Install sediment traps or turbidity curtains (specifically at Gberefu and Agboyi) to capture sediment-laden runoff and prevent	Minimise	Contractor	Construction (before earthworks)	Medium	Maintenance log; water turbidity/TSS monitoring.

	plume formation in the Lagos Lagoon or Badagry Creek.					
Erosion in drainage swales	Install check dams (stone or gravel bags) in temporary swales to reduce runoff velocity, especially critical during the high-intensity rainfall typical of the Lagos coast.	Minimise	Contractor	Construction (as needed)	Low	Check dam inspection log.
Shoreline/Exposed soil stabilisation	Progressive revegetation with native riparian or coastal species	Restore	Contractor	Construction	Low	Revegetation area (m^2); survival rate (%).

	(e.g., *Ipomea pes-caprae* or native grasses) within 14 days of earthworks completion to bind loose soil.					
High-vulnerability sites (Gberefu, Agboyi)	Use coir erosion control blankets (coconut fibre) on sloped embankments or sandy banks to provide immediate stability before vegetation takes root.	Minimise / Restore	Contractor	Construction	Medium	Blanket installation log; visual bank stability.
Peak rainfall avoidance	Strictly avoid major earthworks (site	Avoid	Contractor	Construction	Low	Work schedule; site rainfall records.

	leveling, deep excavation) during peak rainfall months (July and September) to prevent catastrophic wash-off.					
Coastal stockpile management	Locate stockpiles at least 50 m away from the high-water mark; cover with weighted tarpaulins to prevent wind-blown sand loss and rain wash.	Minimise	Contractor	Construction	Low	Stockpile map; inspection log.
Flood-resilient drainage	Install temporary swales directed away from sensitive	Minimise	Contractor	Construction	Low to Medium	Drainage inspection log.

	PHC wards and towards stabilized sediment basins.					

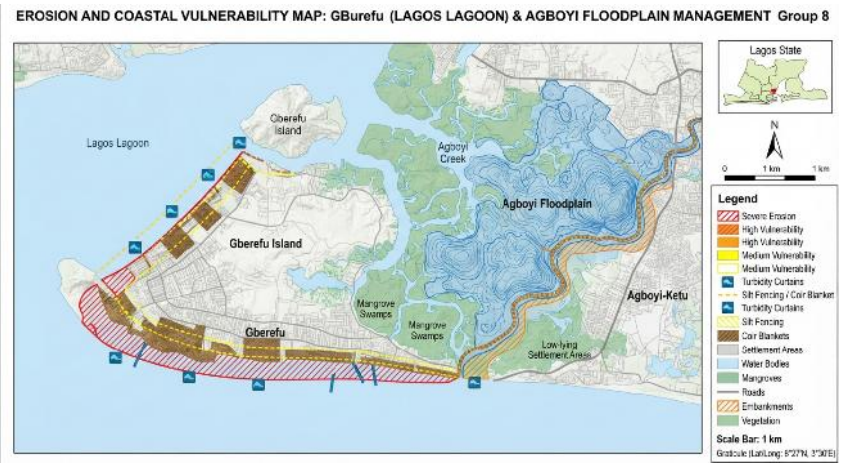


Figure 6.1 – Erosion and Coastal Vulnerability Map

6.5.4 Water Quality Protection

Table 6.9 – Water Quality Protection Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Sediment runoff to water bodies	Silt fences, sediment traps, check dams (see Section 6.2.3) – ensure all sediment control measures are in	Minimise	Contractor	Construction (pre-earthworks)	Low to Medium	Pre-construction inspection; weekly inspection

	place before earthworks begin					
Fuel/oil spills	**Bunded fuel storage** – fuel tanks and drums stored within secondary containment (bund wall or drip tray) with capacity 110% of largest tank volume	Avoid	Contractor	Construction	Medium	Bund inspection (no cracks, no standing water/oil)
Fuel/oil spills (cont'd)	**Spill kits** at all refuelling points, fuel storage areas, and equipment maintenance areas – kits to include absorbent pads, booms, socks, PPE (gloves, goggles), disposal bags	Minimise	Contractor	Construction	Low	Spill kit inventory; staff training records
Fuel/oil spills near water bodies	For sites near water bodies: refuel on land (not on water); use spill-proof couplings; carry spill kit on boat (if	Avoid / Minimise	Contractor	Construction	Medium	Spill incident reports (zero spills target)

	applicable); trained boat operators					
Concrete wash water	Contain concrete wash water in lined pits or portable washout units; allow to settle; neutralise high pH (add CO2 or weak acid); dispose at licensed facility (not into drains or water bodies)	Minimise	Contractor	Construction	Low	Wash water disposal records
Sewage from construction camps	Provide portable toilets (minimum 1 per 20 workers) or temporary septic tanks; contract LAWMA or licensed operator for regular emptying (weekly)	Minimise	Contractor	Construction	Medium	Toilet servicing records; worker GRM complaints
Greywater from construction camps	Direct greywater (kitchen, shower) to soakaway or temporary septic tank; not	Minimise	Contractor	Construction	Low	Inspection log

	discharged to surface water					
Water quality monitoring	Conduct monthly water quality monitoring (during construction) at water bodies within 200 m of sites (see Table 6.7); trigger corrective action if NESREA limits exceeded (TSS >30 mg/L, BOD >6 mg/L, coliforms >0 CFU/100ml, etc.)	Minimise	Contractor / IESM	Construction	Medium	Monitoring data; corrective action reports
No untreated discharge	**Prohibit discharge of untreated wastewater** (sewage, greywater, concrete wash water, industrial wastewater) to surface water bodies or storm drains – enforce through CESMP	Avoid	Contractor	Construction	Low (enforcement)	Inspection reports; incident reports (zero tolerance)

	and daily inspections					

The monitoring focus for Group 8 is centered on the sensitive aquatic interface of the Badagry Creek and Lagos Lagoon, where construction-related runoff and boat logistics present the highest risks to water quality and local fisheries.

Table 6.10 – Water Quality Monitoring Plan (Construction Phase)

Site	Water Body	Parameter	Frequency	Trigger (Corrective Action)	Responsible
Agboyi	Badagry Creek / Floodplain (Downstream)	TSS, Turbidity, pH, DO, Hydrocarbons, Coliforms	Monthly	TSS >30 mg/L; Visible oil sheen; DO <4.0 mg/L	Contractor
Gberefu	Lagos Lagoon (Shoreline)	TSS, Turbidity, pH, DO, Hydrocarbons	Monthly	TSS >30 mg/L; Hydrocarbons visible; Turbidity >10% above baseline	Contractor
Ibereko	Local Drainage / Ground-water (Nearby)	pH, TSS, Nitrates, Hydrocarbons	Quarterly	pH outside 6.5–8.5; TSS >30 mg/L	Contractor

6.5.5 Waste Management (Construction & Operation)

Table 6.11 – Waste Management Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Construction waste – inert	Segregate at source: inert waste (concrete, blocks, bricks, tiles, sand,	Minimise	Contractor	Construction	Low	Waste segregation inspection

	gravel) from other waste					
Construction waste – inert (reuse)	Reuse inert waste as fill for site grading, backfill, or road base (where quality permits)	Minimise / Restore	Contractor	Construction	Low (saving on imported fill)	Waste diversion log (tonnes reused)
Construction waste – inert (recycling)	Crush concrete and blocks for recycled aggregate (where feasible – contract with licensed recycler)	Restore	Contractor	Construction	Medium	Recycling receipts
Construction waste – inert (disposal)	Dispose remaining inert waste at licensed landfill (not open dumps), using only an accredited/licensed waste collection and disposal contractor, with disposal certificates retained,	Minimise	Contractor	Construction	Medium	Disposal receipts (landfill)

Construction waste – wood	Reuse formwork where possible; recycle (chipboard) or donate usable wood to community	Minimise / Restore	Contractor	Construction	Low	Waste diversion log
Construction waste – metal	Recycle scrap steel, rebar, offcuts through licensed scrap dealer	Restore	Contractor	Construction	Low (saving on material cost)	Scrap dealer receipts
Construction waste – packaging	Reduce packaging through just-in-time delivery and supplier take-back programs; recycle plastic, cardboard, paper where feasible	Avoid / Minimise	Contractor	Construction	Low	Waste diversion log
Hazardous waste – asbestos	Licensed abatement contractor; wet removal; double-bagging (200-micron polyethylene); labeled bags (asbestos hazard symbol);	Avoid / Minimise	Licensed abatement contractor	Pre-construction	High	Waste manifests; disposal certificates; air monitoring

	transport by licensed hazardous waste transporter; disposal at licensed hazardous waste landfill					
Hazardous waste – fuels/oils	Store in bunded area (110% capacity); use spill kits; dispose through licensed hazardous waste contractor (not down drains or on ground)	Avoid / Minimise	Contractor	Construction & Operation	Medium	Waste manifests; inspection logs
General waste (operation)	LAWMA collection contract for each facility; provide waste bins (segregated: recyclable, general); no open burning	Minimise	Facility operator	Operation	Low (service fee)	LAWMA collection receipts; inspection logs
Recycling (operation)	Establish recycling program (paper, plastic, glass, metal) – contract	Restore	Facility operator	Operation	Low to Medium	Recycling logs

	with licensed recycler where feasible					

6.5.6 Flooding and Drainage Management

Table 6.12 – Flooding and Drainage Management Mitigation Measures (Badagry Axis)

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Flooding during construction (temporary)	Install temporary drainage channels (swales) and culverts to direct stormwater away from excavation and foundation works	Minimise	Contractor	Construction	Low to Medium	Drainage inspection log
Blocking existing drains	**Avoid blocking existing drains** with construction materials, stockpiles, or waste – maintain clear	Avoid	Contractor	Construction	Low	Daily inspection

	drainage paths					
Flooding – final design (climate-resilient)	Design drainage for **1:100-year storm + 30% climate factor** (to account for increased rainfall intensity by 2050) – oversized culverts, channels, and retention basins	Avoid	Design consultant / PIU	Pre-construction	Medium (design)	Design drawings; hydrological modelling
Flooding – flood-prone sites (Agboyi)	**Elevated electrical panels** – place all electrical panels, generators, and critical equipment above the 1:100-year flood level (plus	Avoid	Design consultant / PIU	Pre-construction	Medium	Design drawings; as-built verification

	freeboard 0.5 m)					
Flooding – coastal sites (Agboyi)	**Elevated floor slabs** – raise finished floor level above projected sea-level rise (0.5 m by 2050) plus storm surge allowance	Avoid	Design consultant / PIU	Pre-construction	Medium to High	Design drawings; as-built survey (elevation)
Flooding – coastal protection (Agboyi)	Install riprap or vegetated revetment along coastal edge (where applicable) to reduce erosion	Minimise	Contractor	Construction	Medium	As-built verification
Flood barriers	For critical equipment (generators, medical equipment), install removable flood barriers	Minimise	Contractor	Construction	Medium	As-built verification

	(demountable or hinged)					
Backflow prevention	Install backflow prevention valves on sewer and stormwater connections to prevent floodwater backflow into facility	Minimise	Contractor	Construction	Low	As-built verification
Rainwater harvesting	Install rainwater harvesting systems (5,000–10,000 L storage for PHCs) to reduce runoff and provide alternative water source	Restore / Adapt	Contractor	Construction	Medium	As-built verification; water use logs

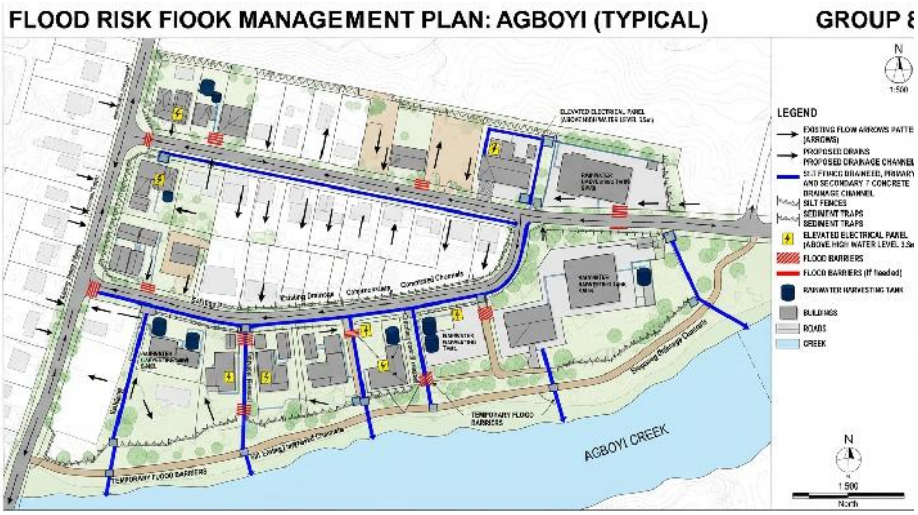


Figure 6.2 – Flood risk management plan (Agboyi – typical)

6.6 Biological Environment Mitigation

6.6.1 Vegetation and Habitat Loss

The mitigation strategy for Group 8 focuses on the preservation of the highly sensitive lagoon-front and riverine ecosystems found in Agboyi and Gberefu, where mangrove and riparian vegetation provide essential coastal protection and flood regulation.

Table 6.14 – Vegetation and Habitat Loss Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Habitat loss (General)	Limit clearing to approve footprint – mark boundaries with high-visibility flagging or	Avoid	Contractor	Pre-construction	Low	Pre-clearing inspection; daily monitoring.

	temporary fencing; strictly no clearing of shoreline vegetation outside project lines.					
Wetland & Floodplain loss (Agboyi)	Establish 30–50 m buffer zone around the Agboyi creek and interior wetlands; no stockpiling of construction materials or waste disposal within this buffer.	Avoid	Contractor	Pre-construction	Low (Setback)	Buffer zone marking; weekly inspection.
Wetland loss (If unavoidable)	Conduct Critical Habitat Assessment; demonstrate Net Gain through biodiversity	Offset	PIU / Biodiversity Specialist	Pre-construction	High r	Offset agreement; long-term (5-year) monitoring eports.

	offsets (3:1 ratio for wetlands); offset must be within the Badagry/Lagos coastal ecoregion.					
Coastal Riparian & Mangrove loss (Gberefu, Agboyi)	Maintain 15–30 m buffer zone from high-water mark; where clearing is necessary for jetties/access, Restore using native species: *Rhizophora racemosa* (Red Mangrove) or *Terminalia catappa*.	Avoid / Restore	Contractor	Pre-construction / Construction	Medium	Survival rate (>80%); acreage of replanted mangroves.
Modified Habitat loss (Ibereko)	Focus on Minimising the removal of mature trees within	Minimise	Contractor	Construction	Low	Tree count before/after construction.

	the existing PHC perimeter; incorporate existing greenery into the new site design.					
Informal retail / Livelihood displacement	Assist petty traders displaced from facility perimeters at Ibereko and Agboyi to relocate to sites that maintain access to their primary customer base.	Minimise / Compensate	PIU (RAP team)	Pre-construction	High (RAP budget)	RAP implementation report; PAP satisfaction survey.
Post-Construction Revegetation	Replant all disturbed areas not covered by hard infrastructure with native coastal grasses and	Restore	Contractor	Post-Construction	Medium	Revegetation area (m^2); survival rate (%).

	shrubs; achieve 80% survival rate after 12 months.					

The selection of species for Group 8 focuses on salt-tolerant, flood-resilient, and shoreline-stabilizing plants suitable for the specific coastal and riverine conditions of Gberefu, Agboyi, and Ibereko.

Table 6.15 – Native Species for Revegetation

Species (Scientific)	Species (Common)	Type	Habitat	Propagation Method	Growth Rate	Purpose
Terminalia catappa	Indian almond	Tree	Coastal, Riparian	Seed, Seedling	Fast	Shade, windbreak, and shoreline erosion control.
Cocos nucifera	Coconut palm	Palm	Coastal	Seedling	Medium	Iconic coastal stabilization and boundary marking (Gberefu).
Paspalum vaginatum	Seashore paspalum	Grass	Coastal, Wetland	Stolon, Seed	Fast	Excellent salt-tolerant erosion control for sandy/brackish edges.
Rhizophora racemosa	Red mangrove	Tree	Mangrove wetland	Propagule	Slow	Mangrove restoration and coastal protection (Agboyi and Gberefu).

Avicennia germinans	Black mangrove	Tree	High-salinity wetland	Propagule	Medium	Enhancing biodiversity in lagoon-front buffer zones.
Ipomea pes-caprae	Railroad vine	Creeper	Sandy beaches	Cuttings, Seed	Very Fast	Rapid stabilization of sandy slopes and dunes (Gberefu).
Axonopus compressus	Carpet grass	Grass	Inland, Disturbed	Stolon, Seed	Fast	General ground cover and soil stabilization for facility perimeters.

Implementation Guidelines for Group 8:

- **Mangrove Restoration (Agboyi/Gberefu):** Propagules should be sourced from healthy local stands and planted during the low-tide cycle to ensure proper anchoring in the silty substrate.
- **Sandy Soil Stabilization (Gberefu):** *Ipomea pes-caprae* should be prioritized for any sandy embankments created during site leveling to prevent wind-driven erosion.
- **Salinity Management:** For newly planted seedlings, ensure initial irrigation uses fresh water (where possible) until the root systems are established enough to handle the brackish groundwater of the Badagry Axis.

6.6.2 Wildlife Protection

The wildlife protection strategy for Group 8 is uniquely focused on the aquatic and semi-aquatic species of the Badagry Creek and Lagos Lagoon, particularly the Vulnerable West African Manatee and various species of marine turtles that may occasionally frequent the coastal fringes of Gberefu.

Table 6.16 – Wildlife Protection Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Direct mortality (Fauna) during clearing	Pre-clearance wildlife survey – conduct survey 48 hours before clearing in riparian/wetland areas (Agboyi, Gberefu) by a trained ecologist; capture and relocate slow-moving fauna (monitors, tortoises, snakes) to suitable nearby habitats.	Avoid / Minimise	Contractor (Ecologist)	Pre-construction	Medium	Survey report; relocation records.
West African Manatee (Vulnerable)	Marine Transit Protocol – Enforce 5-knot speed limits in narrow channels; use propeller	Avoid	Contractor / Boat Captains	Construction	Medium	Boat logs; incident reports (zero strikes).

	guards on logistics boats; prohibit waste dumping in water; maintain "watch for manatees" during water-borne transport.					
No hunting/fishing by workers	Strict prohibition on hunting, trapping, or fishing (including manatees, monitors, pangolins, and lagoon fish) – include in worker Code of Conduct; enforce through daily inspections and heavy sanctions.	Avoid	Contractor	Construction	Low	Signed CoC; incident reports.
Habitat Connectivity	Maintain wildlife	Minimise	Contractor	Construction	Low	Design drawings;

	corridors (culverts with dry ledges and gaps in fencing) to allow movement between the lagoon shoreline and interior scrubland, particularly at Gberefu.					as-built verification.
Vessel Collisions & Noise	Enforce aquatic and terrestrial speed limits (5 knots for boats; 30 km/h for vehicles) to reduce strike risk and underwater noise pollution.	Minimise	Contractor	Construction	Low	Speed monitoring; incident reports.
Light disturbance	Use directional, shielded lighting (downward-	Minimise	Contractor	Construction	Low	Lighting inspection log.

	facing) to prevent light spill into sensitive coastal/riparian habitats, which can disorient nocturnal fauna and nesting turtles.					
Invasive Species	Ballast/Bilge Water Management – Ensure logistics boats do not discharge untreated bilge water; clean equipment to prevent spread of Water Hyacinth (*Eichhornia crassipes*) or other invasive flora.	Avoid	Contractor	Construction	Low	Equipment cleaning log; barge inspection.

Table 6.17 – Species-Specific Mitigation Measures (Group 8: Badagry Axis)

Species	Threat	Mitigation	Responsible	Success Indicator

West African Manatee (*Trichechus senegalensis*) – Vulnerable	Vessel strikes; underwater noise; water pollution.	Speed limits (5 knots); propeller guards; no-dumping policy; worker awareness.	Contractor; Boat Operators	Zero manatee injuries or fatalities.
White-bellied Pangolin (*Phataginus tricuspis*) – Vulnerable	Habitat loss (Ibereko/Gberefu scrub); hunting.	Pre-clearance survey; relocation protocol; no-hunting policy; worker training.	Contractor Ecologist; HSE Officer	Successful relocation (if found); no poaching.
Nile Monitor (*Varanus niloticus*) – Least Concern	Habitat loss (Agboyi/Gberefu wetlands); direct mortality.	Pre-clearance survey; relocation protocol; buffer zone preservation.	Contractor Ecologist	No monitor fatalities during site prep.
Waterbirds (Egrets, Kingfishers) – Least Concern	Loss of nesting/foraging sites; noise disturbance.	Riparian buffer zones (15–30 m); noise curtains; restricted work hours.	Contractor	Preservation of nesting sites; continued presence.
Marine Turtles (Potential nesting at Gberefu)	Light pollution; shoreline disturbance.	Shielded lighting; restricted shoreline access at night; debris removal.	Contractor	No disoriented turtles; zero nest disturbance.

6.7 Socio-Economic Mitigation

6.7.1 Land Acquisition and Resettlement (OS5)

Commented [SA59]: revise

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The socio-economic landscape of Group 8 (Badagry Axis) is defined by its mix of peri-urban markets and high-density riverine settlements. Mitigation measures here focus on protecting

informal livelihoods specifically petty traders and kiosk owners at Agboyi who rely on the immediate vicinity of the PHCs for their customer base.

Table 6.18 – Land Acquisition and Resettlement Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Physical and economic displacement (Agboyi – 2 informal kiosks ;)	Full RAP (separate document) Compensation including: census and asset inventory; valuation at full replacement cost (no depreciation); compensation before displacement; livelihood restoration; vulnerability support; dedicated GRM.	e / Restore PIU / RAP	consultant Pre-const	ruction (Condition Precedent) High (RAP	budget) RAP imple	Mentation report; PAP satisfaction survey; Zero unresolved grievances.

Commented [SA61]: Appropriately reconcile these numbers

Commented [Ma62R61]: Addressed - changed to 2 PAPs

Economic displacement (Petty traders at facility perimeters)	RAP – Compensation at full replacement cost (business income loss, moving costs); provision of alternative stall locations within the community to maintain customer access; business grants for restocking.	Compensate / Restore	PIU / RAP consultant	Pre-construction	High	Business restoration survey; number of successfully relocated traders.
Vulnerable groups (Women-headed households, elderly, riverine poor)	Vulnerability support packages – Additional cash assistance (min. 20% above standard); priority in	Restore / Enhance	PIU / RAP consultant	Pre-construction	Medium	Support delivery records; vulnerability assessment tracking.

	livelihood programs (skills training, grants); psychosocial support; assistance with physical relocation in riverine terrain.					
Informal settlers (Riverine encroachers/Squatters)	Include in RAP – Per AfDB OS5 (Land Acquisition and Involuntary Resettlement).], provide assistance regardless of formal title; ensure same compensation for assets and livelihood support as	Compensate / Restore	PIU / RAP consultant	Pre-construction	High	Inclusion of all informal occupants in final census.

Commented [SA63]: Revise

Commented [Ma64R63]: Addressed

	formal title holders.					
No land take before compensation	Strict Condition Precedent – Construction cannot begin until all PAPs have received full compensation and assistance, as verified by an independent monitor and approved by AfDB.	Avoid	PIU / AfDB	Pre-construction	N/A	Independent verification report; AfDB "No Objection" letter.
Grievance redress (RAP-specific)	Accessible GRM with riverine-specific focal points (e.g., local leaders at Agboyi); 14-day resolution target; clear escalation pathway	Minimise	PIU	Pre-construction & Construction	Low	GRM records (resolution rate vs. time).

	(PIU → LASEPA → AfDB).					
Livelihood restoration (Coastal/Riverine focus)	Livelihood Restoration Program – Skills training (e.g., solar maintenance, tailoring, boat engine repair); business grants (₦50,000–₦200,000 per PAP); priority hiring for site-related work.	Restore / Enhance	PIU / Contractor	Pre-construction & Construction	High	Livelihood restoration survey (income level compared to baseline).

The compensation matrix for Group 8 is tailored to the specific socio-economic profile of the Badagry Axis, where commercial activities are concentrated in informal kiosks and riverine retail, rather than large-scale farming.

Table 6.19 – PAP Categories and Compensation Matrix (Group 8: Badagry Axis – to be detailed in RAP)

PAP Category	Entitlement	Calculation	Delivery Method	Timeline

Commercial (Informal Kiosks – Agboyi)	Business compensation + relocation assistance	Loss of net income (6–12 months based on verification); Cash paym replacement cost for structural materials (wood, zinc, blocks); inventory moving costs; relocation allowance.	ent (Bank transfer or mobile money)	Strictly before displacement or demolition
Informal Petty Traders (Hawkers/Table-top)	Livelihood disruption allowance + relocation assistance	Lump-sum disruption allowance; provision of temporary vending space during construction; transport allowance for moving goods.	Cash payment + alternative site allocation	Before commencement of works in the affected zone
Vulnerable PAPs (Widows, Elderly, Disabled)	Additional cash assistance (20% uplift) + dedicated support	Standard compensation + 20% vulnerability premium; priority enrollment in Livelihood Restoration Programs; physical assistance with relocation.	Cash payment + social worker follow-up	Paid concurrently with standard compensation
Project-Affected Employees (Shop Assistants)	Wage loss compensation	Equivalent of 3–6 months' salary to allow for job	Cash payment	Before displacement of the employer

		seeking; priority for project-related labor (cleaning, security, site help).		
All PAPs	Livelihood Restoration Program (LRP)	Skills training (e.g., solar maintenance, tailoring, boat engine repair); business grants (₦50,000–₦200,000); job placement assistance with contractors.	Enrollment in training; phased cash grants; job referrals	Within 3 months of displacement

6.7.1.1 RAP Implementation Framework (Agboyi)

Table 6.20: RAP Implementation Framework (Agboyi)

Element	Requirement	Responsible	Timeline
Census and asset inventory	Complete verification of 2 PAPs	RAP Consultant	Month 1-2
Valuation	Independent valuation at full replacement cost	Independent Valuer	Month 2
Compensation	Payment of compensation before displacement	PIU	Month 3
Notification	60-day advance notice to PAP	PIU / CLO	Month 1
Livelihood restoration	Business grant, skills training, job placement	PIU / Contractor	Month 4-12
Vulnerable group support	Assessment and additional support as needed	PIU	Month 3-6
GRM	Dedicated RAP grievance channel	PIU	Throughout

Independent verification	IESM verification of RAP completion	IESM	Month 3
Condition Precedent	Compensation must be paid before any site clearing	PIU	Month 3

6.7.2 Livelihoods and Economic Activities

The economic landscape of Group 8 (Badagry Axis) is characterized by riverine commerce, artisanal fishing, and informal cross-border trade. Mitigation measures are designed to protect these activities, particularly the water-based logistics essential to the Agboyi communities.

Table 6.21 – Livelihoods and Economic Activities Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Temporary relocation of riverine/road side vendor (Agboyi)	Provide alternative trading locations in coordination with the Baale and LGA; 14-day advance notification; physical assistance with moving kiosks/goods via boat or land.	Minimise	Contractor / PIU / LGA P	re-construction / Construction	Low	Vendor satisfaction survey; relocation log.
Interruption of Water-	Maintain clear navigation	Minimise	Contractor	Construction	Low	Boat operator feedback; Zero

based Commerce	channels for local passenger and fishing boats during jetty refurbishment (Agboyi, Gberefu); mark exclusion zones clearly; no blocking of community landing sites.					maritime access complaints.
Access management for businesses	Maintain safe access to shops adjacent to PHC boundaries (especially at Ibereko) through temporary walkways, clear signage, and 48-hour notification	Minimise	Contractor	Construction	Low	Business owner feedback; GRM records.

	of any utility disruptions.					
Impact on Artisanal Fishing	Ensure zero discharge of silt or oils into Badagry Creek/Lagoon to protect fish stocks; strictly enforce the "No-Silt" protocol (Section 6.2.3) to avoid clouding local fishing grounds.	Minimise	Contractor	Construction	Low (Standard OHS)	Water quality logs (TSS/Hydrocarbons); fisherman feedback.
Skills training for local youth	Provide certified skills training (apprenticeships) for local youth (minimum 30 positions across Group 8 sites) in construction trades, solar	Enhance	Contractor / PIU	Construction	Medium	Training certificates issued; post-project employment tracking.

	maintenance, and boat engine repair.					
Local hiring preference	Contractor to hire ≥50% of unskilled and semi-skilled labour from the host LGAs (Badagry LGA, Badagry West LCDA, and Kosofe LGA); advertise locally via community town criers and LGA boards.	Enhance	Contractor	Construction	Low	Hiring records (verified by residential address).
Access to healthcare during construction	Maintain partial operation of existing PHC services where possible; if full closure is required for	Minimise	PIU / Contractor	Construction	Medium to High	Continuity of service reports; patient feedback.

	safety, deploy a mobile riverine clinic or provide shuttle boat/ambulance service to the nearest facility.					

The Livelihood Restoration Plan (LRP) for Group 8 focuses on the rapid recovery of informal commercial activities in the high-density riverine settlement of Agboyi and the coastal/peri-urban corridor of Ibereko.

Table 6.22 – Livelihood Restoration Plan Summary

PAP Group	Estimated Number	Livelihood Restoration Activity	Target (Income Restoration)	Timeline	Responsible
Agboyi Displaced Kiosk Owners	2	Structure Replacement: Provision of materials/labor to rebuild kiosks in approved community locations. Business Grants: ₦50,000–₦150,000 for restocking. Skills Training: Small business accounting	100% baseline income within 6 months.	Grants: Within 1 month of displacement; Rebuilding: Within 2 months.	PIU / LGA / Baale of Agboyi

		and riverine logistics safety.			
Ibereko Roadside Traders	5	Alternative Site Allocation: Secure vending spots outside the construction safety zone. Business Grants: ₦50,000–₦100,000. Skills Training: Digital literacy/marketing for small traders and customer service.	100% baseline income within 6 months.	Site allocation: Before construction starts; Grants: Within 1 month.	PIU / Badagry LGA
Riverine Logistics Helpers / Boat Hands	TBD	Priority Hiring: Enrollment in the project's boat safety and marine logistics team. Skills Training: Basic marine engine maintenance and aquatic safety certification.	Improved income levels via formal project employment.	Enrollment: During mobilization phase.	Contractor / PIU
Vulnerable PAPs (All sites)	TBD	Additional Support: Cash "top-up" grants (20% uplift). Direct Referrals: Enrollment in state-led social safety net programs and	Stability and improved resilience within 6 months.	Immediate upon compensation delivery.	PIU / Ministry of Wealth Creation

		specialized vocational training (e.g., tailoring, solar PV assembly).			

6.7.3 Community Health and Safety

The Community Health and Safety strategy for Group 8 (Badagry Axis) must account for the high-density riverine setting of Agboyi and the coastal logistics of Gberefu. A significant portion of this plan involves Maritime Safety to protect local residents and fishermen from hazards associated with project-related boat and barge traffic.

Table 6.23 – Community Health and Safety Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Maritime and Traffic Accidents	Integrated Traffic & Marine Management Plan (TMP/MMP): Install land signage and buoys/water markers (construction warnings); flag persons at site entrances; 5-knot speed limits in Agboyi creek; project boats must have	Minimise	Contractor	Construction	Medium	TMP/MMP logs; boat speed monitoring; Zero maritime collision incidents.

	functional lights/horns; avoid peak water-commute hours (06:30–08:30).					
Pedestrian & Commuter Safety (Agboyi, Ibereko)	Install temporary pedestrian walkways and safety railings along jetty areas; fencing to separate construction zones from high-traffic community paths; use of safety marshals during material offloading.	Minimise	Contractor	Construction	Low to Medium	Daily inspection; resident feedback; Safety marshal logs.
Construction Hazards (Falls, Debris, Water Safety)	Secure Site Fencing: 1.8 m high solid hoarding; signage in English and local Egun/Yoruba ("Danger",	Minimise	Contractor	Construction	Medium	Fencing logs; Security reports; Zero unauthorized entry.

	"Keep Out"); lifebuoys/throwing lines at waterfront sites; security guards to prevent children from entering site/clambering on barges.					
Access to Homes and Riverine Transit	Maintain existing community landing sites (jetties) or provide temporary floating docks; maintain access to adjacent homes via sturdy temporary bridges; 48-hour advance notice for any path closures.	Minimise	Contractor	Construction	Low	Access inspection; GRM complaints from riverine residents.
HIV/AIDS, STI & Communicable Disease Awareness	Conduct quarterly awareness programs for workers and the	Minimise	Contractor / PIU	Construction	Low	Training records; condom distribution logs.

	community; focus on risks associated with labor influx; distribute condoms; provide free, voluntary testing for workers.					
Community Health Surveillance	Track respiratory complaints related to dust and water-borne diseases; monitor health impacts of potential labor influx in isolated sites like Gberefu; coordinate with Badagry/Kosofe LGA health depts.	Minimise	PIU / LGA Health Dept.	Construction	Low	Monthly health surveillance reports.
Emergency Response (Fire, Flood, Drowning)	Emergency Preparedness and Response Plan (EPRP): Site-specific plans for	Minimise	Contractor	Construction & Operation	Medium	Drill logs; EPRP availability; training records.

	flooding and maritime rescue; train workers in First Aid and water rescue; coordinate with LASWA (Lagos State Waterways Authority, and the Lagos State Safety Commission,) and LASEMA; maintain rescue boats.					
Community Awareness & GBV Prevention	Conduct quarterly town hall sessions on site safety; emphasize the Code of Conduct regarding interaction with local women and children; promote the GRM channels.	Minimise	Contractor / PIU	Construction	Low	Attendance records; GBV/SEA awareness metrics.

The risk assessment for Group 8 reflects the specific geographical and social complexities of the Badagry shoreline and the Agboyi riverine floodplain. Priority is assigned based on the proximity of residential dwellings and the intensity of community reliance on shared transit corridors (land and water).

Table 6.24 – Community Health Risk Assessment Summary by Site

Site	Risk	Mitigation	Responsible	Priority
Agboyi	Extreme density & Water safety: High risk of drowning, water-borne debris, and noise/dust impacts on homes within 5–10m.	Silt/Safety curtains; 5-knot speed limit; noise barriers; lifebuoys; community marshals; advanced GRM.	Contractor	Critical
Ibereko	Traffic & Market dynamics: High pedestrian-vehicle conflict near the road; dust/noise impacts on peri-urban dwellings and traders.	Dust control (watering); noise shields; traffic management plan (TMP); signage; temporary walkways.	Contractor	High
Gberefu	Coastal logistics & Isolation: Risk of maritime accidents during material transport; impact of labor influx on a relatively isolated community.	Marine Management Plan (MMP); labor code of conduct; health surveillance; emergency rescue boat on standby.	Contractor	High

6.8 Labour and Working Conditions

6.8.1 Worker Welfare

Table 6.25 – Worker Welfare Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Child labour	Prohibit child labour (any person under 18 for hazardous work; under 15 for any work, or	Avoid	Contractor	Construction	Low (enforcement)	Age verification records; inspection reports;

	minimum age of compulsory schooling) – include in worker Code of Conduct; verify age (government-issued ID or birth certificate) for all workers; conduct regular site inspections (random, unannounced)					incident reports (zero tolerance)
Forced labour	Prohibit forced labour (no forced, bonded, or prison labour; workers free to leave after shift; no withholding of wages, identity documents, or passports; no physical or psychological coercion) – include in worker Code of	Avoid	Contractor	Construction	Low (enforcement)	Worker GRM records; incident reports (zero tolerance)

	Conduct; worker GRM to report violations					
Written contracts	Provide written contracts in a language the worker understands (English or Yoruba) before starting work; contracts to include: wages (hourly/monthly, overtime rate), working hours, leave entitlements, termination conditions, grievance mechanism	Minimise	Contractor	Construction	Low	Contract sample; worker interviews (random)
Timely payment	Pay wages on time (weekly or monthly, as per contract); pay at least minimum wage (National Minimum Wage Act: ₦30,000/month	Minimise	Contractor	Construction	Low	Payslip review; worker interviews

	(approx. US$20) – but many construction workers earn more); provide payslips; no unauthorised deductions					
Working hours	Limit working hours to 8 hours/day, 40 hours/week (plus overtime at overtime rate, not exceeding 4 hours/day or 12 hours/week); mandatory rest breaks (30 minutes every 4 hours); one day off per week	Minimise	Contractor	Construction	Low	Work hour logs; worker interviews
Worker accommodation (camps) If camps	provided: Camp site Management Plan (Appendix Minimise 2.3) including: adequate space (minimum 3.5 m² per person);	Contracto	r Construct	ion Medium	Campsite	inspection; worker GRM complaints

	water supply (safe drinking water); sanitation (toilets (1 per 20 workers), showers (1 per 20 workers), laundry); waste management (bins, LAWMA collection); kitchen/canteen (hygienic); safety (fire extinguishers, first aid); security; GBV prevention (Code of Conduct, female-only areas if female workers)					
Worker grievance mechanism	Establish worker GRM (separate from community GRM) – accessible, confidential, no retaliation;	Minimise	Contractor	Construction	Low	GRM records (complaints received, resolved,

	channels: supervisor (first level), designated worker welfare officer (second level), contractor management (third level), PIU (fourth level); timeline: acknowledge within 48 hours, resolve within 14 days					time to resolve)
Non-discrimination	Prohibit discrimination based on gender, ethnicity, religion, disability, HIV status, pregnancy, marital status, age, or political opinion – include in worker Code of Conduct; equal pay for equal	Avoid	Contractor	Construction	Low	Worker interviews; GRM complaints

	work (regardless of gender)					
Freedom of association	Respect freedom of association – workers have the right to form or join trade unions, and to bargain collectively; no retaliation for union membership or activities	Avoid	Contractor	Construction	Low	Worker interviews; GRM complaints

6.8.2 Occupational Health and Safety (OHS)

Table 6.26 – Occupational Health and Safety Mitigation Measures

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
OHS management system	OHS Plan (Appendix 15) including: hazard identification and risk assessment (HIRA); safe work procedures (SWP) for	Minimise	Contractor	Construction	Medium	OHS Plan document; training records; incident reports

	high-risk activities (working at height, electrical work, confined spaces, asbestos abatement, machinery operation, manual handling); training (induction + monthly toolbox talks); PPE (see below); incident reporting and investigation; emergency response					
PPE (Personal Protective Equipment)	Provide PPE free of charge to all workers, suitable for hazards: hard hat, safety	Minimise	Contractor	Construction	Medium	PPE issue records; daily inspection (PPE compliance)

	boots, high-visibility vest, gloves (general), goggles (dust, chemicals), hearing protection (noise >85 dB(A)), respiratory protection (dust – N95 mask; asbestos – P3 respirator), fall protection (harness, lanyard, anchor point for work >2 m height)					
Training	Induction training for all workers before starting work (OHS, emergency response, Code of Conduct, GBV,	Minimise	Contractor	Construction	Low	Training attendance records; toolbox talk logs

	GRM); monthly toolbox talks (15–30 minutes) on specific hazards (fall protection, electrical safety, manual handling, dust control, asbestos awareness, fire safety, heat stress)					
Working at height	Fall protection: guardrails on scaffolding and roofs; safety harness with lanyard and anchor point for work >2 m height; regular inspection of scaffolding, ladders, and harnesses; training on	Minimise	Contractor	Construction	Medium	Inspection logs; training records

	safe use of ladders and scaffolding					
Electrical safety	Licensed electricians only; lockout/tagout (LOTO) for electrical maintenance; insulated tools; PPE (insulated gloves, rubber matting); regular inspection of cables, plugs, and equipment; no exposed wiring	Minimise	Contractor	Construction	Medium	LOTO procedure; inspection logs
Machinery safety	Equipment guarding (moving parts guarded); operator training; exclusion zones (no unauthorised entry within	Minimise	Contractor	Construction	Medium	Training records; inspection logs

	radius of excavator swing, crane lifting area); daily pre-use inspection (brakes, lights, horn, hydraulics, etc.)					
Manual handling	Training on safe lifting techniques (bend knees, keep back straight, load close to body); use mechanical aids (wheelbarrow, trolley, crane) where feasible; team lifting for heavy loads (>25 kg)	Minimise	Contractor	Construction	Low	Training records; incident reports
Heat stress	Provide shade (tents, umbrellas); water breaks (every 30	Minimise	Contractor	Construction	Low	Water availability; training records; incident

	minutes, provide cool drinking water); rest periods (10 minutes every hour during peak heat (12:00–14:00)); acclimatisation (new workers start with shorter shifts); training on heat stress symptoms (dizziness, nausea, confusion)					reports (heat stress)
First aid	First aid kit (stocked, accessible) at each site; trained first aiders (minimum 1 per 50 workers); emergency transport to	Minimise	Contractor	Construction	Low	First aid kit inspection; first aider certificates

	clinic/hospital (arranged with local health facility)					
Fire safety	Fire extinguishers (appropriate type: water, CO2, dry powder) at key locations (fuel storage, generator, kitchen, electrical room); fire assembly point; evacuation drill (quarterly); training on fire extinguisher use	Minimise	Contractor	Construction	Low	Fire extinguisher inspection; drill logs
Medical surveillance	Pre-employment medical (baseline); periodic medical (annually for	Minimise	Contractor	Construction, Operation	Medium	Medical records; vaccination records

	asbestos-exposed workers, waste handlers); exit medical (for asbestos-exposed workers); Hepatitis B vaccination for waste handlers, health workers; tetanus vaccination for all workers					
Incident reporting	Report all incidents (near-misses, injuries, illnesses, spills, GBV, security incidents) within 24 hours to PIU; investigate root cause; implement corrective	Minimise	Contractor	Construction	Low	Incident reports; corrective action records

	actions; maintain incident log					

6.9 GBV/SEA/SH Mitigation

Note: Detailed GBV/SEA/SH mitigation measures are provided in Chapter 9 (GBV/SEA/SH Action Plan). Key measures summarised below.

Table 6.27 – GBV/SEA/SH Mitigation Measures

Risk	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Sexual exploitation and abuse (SEA)	Code of Conduct (CoC) prohibiting SEA (mandatory for all workers, subcontractors, security); training (induction + monthly refreshers); confidential reporting (hotline, suggestion boxes, female GRM focal points); referral pathways (medical (PEP within 72 hours), psychosocial, legal, shelter);	Avoid / Minimise	Contractor / PIU / GBV Specialist	Pre-construction, Construction, Operation	Medium	Training records; GRM records (GBV cases); referral records

	survivor-centered approach; sanctions (warning, suspension, termination, legal prosecution)					
Sexual harassment (SH)	CoC prohibiting SH; training; reporting; sanctions	Avoid / Minimise	Contractor / PIU	Construction	Medium	As above
GBV in communities	Community awareness (quarterly); women's groups; traditional/religious leaders engagement; safe spaces; improved lighting; referral pathways; GRM	Minimise	PIU / GBV Specialist	Construction, Operation	Low to Medium	Community satisfaction survey; GBV incident reports
Under-reporting	Confidential reporting channels (hotline, suggestion boxes, female GRM focal points, anonymous options); survivor-centered approach	Avoid	PIU / GBV Specialist	Construction, Operation	Low	GRM records (anonymous reports accepted); survivor satisfaction

	(confidentiality, safety, respect, no retaliation, no victim-blaming); no retaliation policy					

6.10 Climate Change Mitigation and Adaptation

6.10.1 Climate Change Mitigation (GHG Reduction)

Table 6.28 – Climate Change Mitigation Measures (Badagry Axis)

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
GHG emissions (construction – embodied carbon)	Use low-carbon materials where feasible: low-carbon cement (reduced clinker content, e.g., Portland limestone cement (PLC)); recycled steel (where available); reduced cement content in	Minimise	Contractor	Construction	Low to Medium	Material purchase records; embodied carbon calculation

	concrete (use fly ash or slag if available); local sourcing (reduce transport emissions)					
GHG emissions (construction – fuel use)	Use fuel-efficient equipment; maintain equipment (proper tyre pressure, engine tuning); reduce idling (turn off engine when not in use for >5 minutes); use low-sulphur diesel	Minimise	Contractor	Construction	Low	Fuel consumption records; maintenance logs
GHG emissions (operation – energy)	**Solar PV** (1.55–3.1 MW total capacity across	Avoid / Minimise	Contractor / Facility operator	Construction, Operation	Medium to High (solar)	Solar PV generation (kWh); grid/generator

	LSHIP programme; Badagry Axis share proportionate) – primary power source; battery storage (24–48 hours backup); energy-efficient equipment (LED lighting, high SEER AC, Energy Star-rated medical equipment); natural ventilation (reduce AC use)					consumption (kWh); GHG inventory (tCO2e/year)
GHG inventory	**GHG inventory**– calculate baseline (existing	Measure	PIU / Facility operator	Construction, Operation	Low	GHG inventory report

	facilities – diesel generator use) and project emissions (construction + operation); track annually; report to AfDB and FMEnv (as required)					

6.10.2 Climate Change Adaptation (Resilience)

The **Badagry Axis (Group 8)** is highly vulnerable to climate change, specifically rising sea levels, coastal erosion, and high-intensity pluvial flooding. The resilience strategy focuses on "building back better" to ensure that the healthcare facilities remain operational during extreme weather events, which are increasingly common in the Lagos coastal plain.

Table 6.29 – Climate Change Adaptation Measures (Group 8: Badagry Axis)

Impact	Adaptation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Flooding (Pluvial & Tidal) – Agboyi, Gberefu	Oversized Drainage: Design for 1:100-year storm + 30% climate factor. Elevation: Elevated	Avoid	Design Consultant / PIU	Pre-construction / Construction	Medium	Design drawings; As-built verification of panel heights.

	electrical panels (min. 1.5m above ground); backflow prevention valves to prevent lagoon water ingress.					
Sea-Level Rise & Storm Surge – Gberefu, Agboyi	Elevated Floor Slabs: Minimum 0.5m above projected 2050 sea levels + 0.5m freeboard. Shoreline Protection: Riprap revetment at jetties; Mangrove buffer restoration (Section 6.2.4) to break wave energy.	Avoid	Design Consultant / PIU	Pre-construction / Construction	High	As-built survey (Finished Floor Level elevation).

Heatwaves	Cool Roofs: Reflective coating (SRI ≥78). Passive Cooling: Cross-ventilation design; shading through native tree planting (Tropical Almond). Energy Efficiency: High SEER (≥20) ACs and DC-powered fans.	Avoid / Minimise	Design Consultant / Contractor	Pre-construction / Operation	Medium	Material specs; Indoor temperature monitoring (< 28°C).
Extreme Rainfall / Coastal Storms	Reinforced Structures: Roof designs with high wind load resistance (≥150 km/h); impact-resistant	Avoid	Design Consultant / Contractor	Pre-construction / Construction	Medium	Wind load certification; Solar uptime logs.

	glazing. Resilient Power: Solar PV arrays with reinforced mounting frames and battery storage for 24/7 autonomy.					
Water Scarcity & Saline Ingress	Rainwater Harvesting: 10,000L minimum storage to offset saline groundwater. Salinity Protection: Water-efficient, corrosion-resistant plumbing fixtures. Borehole Resilience: Deep-well completion	Avoid / Minimise	Design Consultant / Facility Operator	Pre-construction / Operation	Medium	Rainwater storage capacity; Water salinity (TDS) monitoring.

	with saline-seal casing.					

The climate resilience strategy for Group 8 is heavily weighted toward coastal and riverine protection. Given the geographical profile of these sites, the design focuses on preventing saltwater intrusion, managing high water tables, and ensuring structural integrity against coastal storms.

Table 6.30 – Climate Resilience Features by Site

Site	Flood Risk	Coastal Risk	Heatwave Risk	Climate Resilience Features
Agboyi	High (Riverine/Pluvial)	High (Brackish surge)	Medium	Elevated Floor Slabs (1.0m+); elevated electrical panels; oversized drainage with backflow valves; noise/heat-reducing cool roof; reinforced shoreline piling.
Gberefu	Medium (Sandy/Inland)	High (Sea-level rise)	High (Reflective sand)	Coastal Buffer (Mangrove/Vine restoration); elevated slab; salt-resistant roofing; Solar PV with reinforced frames; deep-well saline seal; rainwater harvesting.
Ibereko	Medium (Surface runoff)	Low	High (Peri-urban)	Oversized Drainage; cool roof (SRI ≥78); natural cross-ventilation; native shade trees (*Terminalia catappa*); rainwater harvesting for facility maintenance.

6.11 Healthcare Waste Management (HMWMP)

Note: Detailed healthcare waste management measures are provided in Chapter 8 (Hazardous and Medical Waste Management Plan – HMWMP). Key measures summarised below.

Healthcare waste management in the Badagry Axis requires specific logistical planning due to the riverine nature of Agboyi and the coastal isolation of Gberefu. Waste transport must account for water-borne movement to ensure hazardous materials do not contaminate the Lagos Lagoon or Badagry Creek.

Table 6.31 – Healthcare Waste Management Mitigation Measures (Summary – Group 8: Badagry Axis)

Impact	Mitigation Measure	Hierarchy	Responsible	Timing	Cost	Monitoring Indicator
Infectious Waste	Segregation at source (yellow bins); leak-proof, labeled storage; on-site autoclave treatment; final disposal via LAWMA Medical licensed facility.	Minimise	Facility Operator	Operation	Medium	HMWMP inspection; Waste manifests.
Sharps	Puncture-proof containers (red/yellow); seal at ¾ full; incineration; strictly no recapping of needles; secure storage prior to boat transport.	Minimise	Facility Operator	Operation	Low	Container usage logs; Waste manifests.
Pathological Waste	Dedicated cold storage; Incineration only (high-temperature) at licensed central facility.	Minimise	Facility Operator	Operation	Medium	Waste manifests; Disposal certificates.

Pharmaceutical Waste	Inventory management to reduce expiry; return to supplier/manufacturer or high-temperature incineration via LAWMA Medical.	Minimise	Facility Operator	Operation	Low	Inventory logs; Waste manifests.
Chemical Waste	Segregation (blue bins); storage in secondary containment; disposal via licensed hazardous waste contractor.	Minimise	Facility Operator	Operation	Medium	Hazardous waste manifests.
Healthcare Worker Training	Annual training on HMWMP (segregation, PPE, spill response, and safe riverine transport of waste).	Minimise	Facility Operator	Operation	Low	Training records; Staff competency assessments.
Asbestos (Potential at Ibereko/Agboyi refurbishment)	Licensed abatement contractor; wet removal to prevent fiber release; double-bagging; disposal at	Avoid / Minimise	Licensed Contractor	Pre-construction	High	Air monitoring reports; Waste manifests.

	designated hazardous waste landfill.					

6.12 Summary of Mitigation Measures (Consolidated Matrix)

The following table consolidates the environmental and social mitigation measures for Group 8 (Badagry Axis). This matrix serves as the primary reference for the Contractor's Environmental and Social Management Plan (CESMP) and long-term facility operation.

Table 6.32 – Consolidated Mitigation Matrix

Impact Category	Impact	Mitigation Measure	Mitigation Hierarchy	Responsible	Cost	Monitoring Indicator	Chapter Reference
Physical Environment	Dust	Water spraying (3× daily in dry season); 30 km/h site speed limits.	Minimise	Contractor	Low	Watering log; visual monitoring	6.4.1
	Asbestos (Agboyi / Ibereko)	Licensed abatement; wet removal; double-bagging; disposal at hazardous waste landfill.	Avoid / Minimise	Licensed Contractor	High	Air monitoring; waste manifests	6.4.1

Commented [SA65]: This should be quantified in USD

Commented [Ma66R65]: The detailed cost allocations for mitigating impacts for the Badagry Axis included in **Section 7.1** and **Section 7.2** and also **Chapter 6**

	Noise	Noise curtains; scheduling outside peak hours; 5-knot speed limit for boats near Agboyi.	Avoid / Minimise	Contractor	Medium	Noise monitoring; community feedback	6.4.2
	Soil Erosion (Gberefu / Agboyi)	Reinforced silt fences; turbidity curtains (lagoon-side); coir erosion blankets.	Minimise	Contractor	Low	Silt fence & turbidity curtain inspection	6.4.3
	Water Pollution (Maritime)	Bunded fuel storage; spill kits on-site and on transit boats; zero discharge to Lagoon/Creek.	Avoid / Minimise	Contractor	Medium	Spill reports (Target: Zero)	6.4.4
	Flooding (Design)	Oversized drainage (1:100-year + 30%);	Avoid	Design Consultant	Medium	Design drawings; as-built	6.4.6

		elevated electricals (min 1.2m above ground).				verification	
Biological Environment	Shoreline/ Wetland Loss (Agboyi / Gberefu)	15–30m riparian buffer; if unavoidable, Mangrove offset (3:1 ratio) and Net Gain assessment.	Avoid / Offset	PIU / Biodiversity Specialist	High	Buffer zone marking; offset survival rate	6.5.1
	Manatees / Turtles (Coastal)	Propeller guards; 5-knot speed limit; turtle-friendly directional lighting.	Avoid / Minimise	Contractor	Medium	Boat logs; strike reports (Target: Zero)	6.5.2
Socio-Economic	Resettlement (Agboyi / Ibereko)	Full RAP; compensation for informal kiosks at replacement cost; livelihood	Compensate / Restore	PIU / RAP Consultant	High	RAP implementation report; PAP survey	6.6.1

		restoration grants.					
	Community Safety (Marine)	Marine Management Plan; water markers/buoys; lifebuoys at waterfront sites.	Minimise	Contractor	Medium	Incident reports; marine traffic log	6.6.3
Labour	Labour Influx	Local hiring preference (≥50% from Badagry/Kosofe LGAs); Worker Code of Conduct.	Minimise	Contractor / PIU	Medium	Hiring records; community liaison log	6.7.1
	OHS – Water Safety	Life jackets for all riverine transit; water rescue drills; 24/7 rescue boat on standby.	Avoid / Minimise	Contractor	Medium	Drill logs; PPE compliance checks	6.7.2
	Child Labour	Strict age verification	Avoid	Contractor	Low	Age verificati	6.7.1

		(ID cards); Worker Code of Conduct; daily site audits.				on records	
GBV / Gender	GBV/SEA/SH	Code of Conduct; SEA/SH training; confidential reporting (Chapter 9); referral pathways.	Avoid / Minimise	Contractor / PIU	Medium	Training records; GRM case logs	Chapter 9
Climate	GHG Emissions	Solar PV (Reinforced frames); energy-efficient fixtures; smart metering.	Avoid / Minimise	Contractor / Operator	Medium to High	Solar generation (kWh)	6.9.1
	Climate Resilience	Elevated slabs (Gberefu/Agboyi); 10,000L rainwater harvesting; cool roofs.	Avoid	Design Consultant	Medium	Finished Floor Level survey; storage capacity	6.9.2

Waste	Healthcare Waste	HMWMP: Segregation at source; water-tight secondary containment for boat transit; autoclave.	Minimise	Facility Operator	Medium	Waste manifests; LAWMA certificates	Chapter 8

6.13 Conclusion

Chapter 6 has presented comprehensive mitigation measures for all identified adverse impacts of the Group 8 (Badagry Axis) facilities, specifically tailored to the unique riverine and coastal environments of Agboyi, Gberefu, and Ibereko. These measures follow the mitigation hierarchy (Avoid → Minimise → Restore → Offset) to ensure environmental sustainability and social safeguards.

The mitigation measures are operationalized in the Environmental and Social Management Plan (ESMP) in Chapter 7, which defines the specific responsibilities, monitoring indicators, reporting requirements, and the necessary budget to ensure the successful implementation of the project within the Badagry Axis.

CHAPTER 7 – ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP)

7.1 General Introduction

The ESMP translates the Chapter 6 mitigation measures into actions, responsibilities, monitoring requirements, and performance indicators for Ibereko, Gberefu, and Agboyi across pre-refurbishment, refurbishment, and operation. It ensures compliance with the AfDB ISS, FMEnv EIA Act, NESREA, LASEPA, IFC Performance Standards, WHO, and ILO conventions. Because the axis spans two local government areas (Badagry LGA for Ibereko/Gberefu; Kosofe LGA for Agboyi) and depends on waterborne logistics for two of its three sites, the ESMP incorporates cross-jurisdictional coordination and barge/canoe safety management not required at single-LGA, road-accessible axes.

7.1.1 ESMP Structure and Approach

The ESMP for the Badagry Axis (Group 8) is structured to address the unique characteristics of this axis:

1. **Site-Specific ESMPs:** Separate ESMPs for Ibereko, Gberefu, and Agboyi reflecting their distinct sensitivities:
    - **Ibereko:** Road-accessible, suspected asbestos, structural issues (rising damp)
    - **Gberefu:** Island (barge-only), suspected asbestos, mangrove Critical Habitat, cultural heritage
    - **Agboyi:** Floodplain (barge/canoe-only), mangrove Critical Habitat, extreme fluvial flooding
2. **Cross-Jurisdictional Coordination:** The axis spans two LGAs (Badagry LGA and Kosofe LGA), requiring coordination across both jurisdictions.
3. **Waterborne Logistics:** Two of the three sites (Gberefu, Agboyi) are only accessible by water, requiring:
    - Barge/canoe safety protocols
    - Barge-to-Truck waste-transfer system
    - Marine spill prevention and response
    - Waterborne-transit OHS training
4. **Climate Resilience:** Specific design features for:
    - Extreme fluvial flooding (Agboyi - water levels to 5m)

- Coastal storm surges (Gberefu)
- Saline corrosion (all sites)
- Sea-level rise (0.5-0.8m by 2100)

5. **Project Lifecycle Phases:**
   - Pre-construction: RAP completion, asbestos surveys, design finalization
   - Construction: 12-18 months, staggered across 3 sites
   - Operation: 50+ years
   - Decommissioning: End-of-life framework (Chapter 8 Part B)

Table 7.1: ESMP Risk-Based Approach

Risk Level	Definition	Examples (Badagry Axis)	Management Approach
Critical	Must be avoided or fully mitigated	Asbestos exposure, GBV/SEA/SH reporting gaps, extreme fluvial flooding	Avoidance + full mitigation with offset
Major	Must be mitigated	Mangrove disturbance, water quality risks, resettlement, cultural heritage	Mitigation to acceptable levels
Moderate	Manageable with standard measures	Dust, noise, labour influx, livelihood disruption	Standard mitigation measures
Minor	Easily mitigated	Operational emissions, minor waste	Good housekeeping

Table 7.2: Detailed ESMP Cost Breakdown

Category	Sub-Category	Activity	Cost (USD)	Responsible	Timing
Environmental Monitoring	Air Quality	PM10/PM2.5 monitoring equipment + weekly sampling (3 sites)	$12,000	Contractor	Construction
	Noise	Sound level meters + weekly monitoring (3 sites)	$10,000	Contractor	Construction
	Water Quality	Monthly lab analysis (Lagoon, River)	$14,000	Contractor	Construction
	Asbestos	Air monitoring during abatement (Ibereko, Gberefu)	Included in abatement	Specialist	Pre-construction
Hazardous Materials	Asbestos Abatement	Licensed survey, wet removal, disposal (Ibereko, Gberefu)	$55,000	Specialist Contractor	Pre-construction
	Asbestos PPE	P3 respirators, Type 5 coveralls, gloves	$5,000	Contractor	Pre-construction
Biodiversity	Mangrove Buffer	50m buffer demarcation, signage (Gberefu, Agboyi)	$15,000	Contractor	Pre-construction

	Biodiversity Offset	Offset plan, restoration planting (if unavoidable)	$30,000	PIU	Pre-construction
	Ecological Surveys	Confirmatory Critical Habitat surveys	$10,000	PIU	Pre-construction
Social	RAP Implementation	Compensation + livelihood restoration (Agboyi - 2 PAPs)	$10,000-$20,000	PIU	Pre-construction
	GBV/SEA/SH Action Plan	Training, confidential GRM, referral pathways	$16,000	PIU/Contractor	Pre-construction + Construction
	Labour Influx Management	Worker camp controls, CoC, monitoring	$8,000	Contractor	Construction
	Stakeholder Engagement	Quarterly meetings, disclosure, liaison	$9,000	PIU	All phases
	GRM	Hotline, boxes, CLOs, reporting	$5,000	PIU	All phases
Health & Safety	OHS	Waterborne-transit safety (life jackets), OHS training	$8,000	Contractor	Construction
	Traffic/Waterway Management	Marshals, signage, barriers, speed control	$7,000	Contractor	Construction

	Flood-Contegency Response	Emergency plan for extreme flooding (Agboyi)	$5,000	Contractor	Construction
	Fuel Spill Prevention	Bunded storage, spill kits, training	$6,000	Contractor	Construction
Waste Management	Barge-to-Truck System	Transfer point setup, manifest system (Gberefu, Agboyi)	$15,000	Facility Operator	Operation
	LAWMA Contracts	Medical waste collection + manifests	$8,000/year	Facility Operator	Operation
Infrastructure	Structural Remediation	Damp-proof course, structural repair (Ibereko, Gberefu)	$20,000	Contractor	Construction
	Flood-Resilient Design	Elevated foundations, flood barriers (Agboyi)	$22,000	PIU/Design Contractor	Pre-construction
	Cultural Heritage Protection	Dedicated protocol for Point of No Return (Gberefu)	$8,000	Contractor/CLO	Construction
Capacity Building	ESMP Training	ESMP implementation training for PIU/Contractors	$8,000	PIU	Pre-construction

	GBV Training	Induction + monthly refreshers	$4,000	Contractor	Construction
Independent Monitoring	IESM Audits	Quarterly audits, RAP verification (3 sites x 4 audits/year)	$18,000	IESM	Construction + Operation
Contingency	Unforeseen E&S issues	10% of above	$30,000	PIU	All phases
TOTAL			$303,000-$315,000		

Table 7.3: ESMP Budget by Phase

Phase	Key Activities	Estimated Cost (USD)	% of Total
Pre-Construction	RAP, asbestos surveys, mangrove surveys, design, permitting, CESMP approval	$85,000-$100,000	28-32%
Construction	Monitoring, mitigation, OHS, GBV, waste management	$160,000-$170,000	52-54%
Operation	HMWMP, LAWMA contracts, solar maintenance	$30,000-$35,000	10-11%
Contingency	Unforeseen E&S issues	$28,000-$30,000	9-10%
TOTAL		$303,000-$315,000	100%

Note: RAP compensation (Agboyi) is budgeted separately: $5,000-$15,000. Costs are based on Nigerian market rates and AfDB safeguard requirements.

7.2 Site-Specific ESMPs

This section presents site-specific ESMPs, each structured into:

A. Biophysical Management: Measures to prevent or minimise impacts on air, water, soil, wetlands, biodiversity, and hazardous materials.

B. Social Management: Measures addressing livelihoods, resettlement, labour influx, GBV/SEA/SH, cultural heritage, and community engagement.

C. Health & Safety Management: Measures to protect workers and communities from general OHS risks, asbestos exposure, traffic hazards, heat stress, as well as specialized worker safety protocols (working at height, confined space entry, electrical safety, and chemical safety) and community safeguards regarding hazardous materials and waste management.

D. Monitoring Indicators: Key parameters, frequency, and thresholds used to verify ESMP effectiveness.

E. Responsibilities: Clear assignment of duties to the Contractor, PIU, Facility Operator, and Independent Environmental & Social Monitor (IESM).

Each ESMP table below provides targeted actions that directly respond to the unmitigated impacts identified in Chapter 5.

This infographic outlines the comprehensive framework for a Site-Specific Environmental & Social Management Plan, detailing its key pillars for biophysical and social protection, safety standards, monitoring, and operational responsibilities.



Figure 7.1: Site-Specific ESMP (Environmental & Social Management Plan) Framework

7.2.1 Site-Specific ESMP for Ibereko

A. Biophysical Management

- **Asbestos:** Licensed abatement; wet removal; HEPA vacuums; air monitoring | Performance Indicator: ≤ 0.1 f/ml.
- **Structural Failure (Rising Damp):** Damp-proof course remediation | Performance Indicator: Zero recurrence within defects liability period.
- **Dust & Emissions:** Water spraying during roofing works | Performance Indicator: No visible dust plumes.
- **Waste & Effluent Management:** On-site solid waste segregation; safe containment of demolition waste; chemical/solvent storage with secondary bunding (110% capacity); controlled greywater management preventing discharge into local drainage | Performance Indicator: 100% waste tracking compliance; zero uncontained chemical/fuel spills; zero illegal dumping.

Commented [SA67]: Consider including waste management i.e. solid, sludge waste and waste water. Also, spill management from chemicals etc. How is the aqua ecology and ecosystem services going to be protected through the project cycle? Overall, should be reflective of the quantifiable significant impacts captured.

Commented [Ma68R67]: Addressed

- **Aquatic Ecology & Ecosystem Services:** Protection of local surface drainage pathways through silt traps and vegetative buffers to prevent siltation of downstream aquatic habitats | Performance Indicator: Zero siltation load violations in receiving drains.

B. Social Management: Community communication on works, waste handling, and asbestos-removal schedule; 100% adjacent-household notification.

C. Health & Safety Management: Asbestos PPE and restricted access (100% PPE compliance); standard road-traffic safety; hazardous material handling protocols; specialized OHS covering safe chemical handling and storage.

D. Monitoring Indicators: Asbestos air monitoring continuous during abatement; structural-integrity inspection post-remediation; weekly noise monitoring; weekly waste-manifest verification logs.

E. Responsibilities: Specialist contractor (asbestos, damp remediation); Contractor (dust control, waste handling, spill containment); PIU (monitoring oversight, GRM).

7.2.2 Site-Specific ESMP for Gberefu

A. Biophysical Management

- **Asbestos:** Licensed abatement; wet removal; HEPA vacuums; air monitoring | Performance Indicator: ≤ 0.1 f/ml.
- **Mangrove/Critical Habitat Disturbance:** Strict 50 m buffer enforcement; biodiversity offset if unavoidable | Performance Indicator: No unauthorised clearing; offset plan approved.
- **Badagry Lagoon Contamination & Spill Control:** Sediment traps; bunded barge fuel storage (110% capacity); mandatory onboard spill kits and rapid-response protocols | Performance Indicator: TSS ≤ 30mg/L; zero uncontained fuel or chemical spills.
- **Waste Management:** Segregation and onshore disposal of solid construction waste; containment and licensed hauling of sanitary sludge and wastewater from temporary site facilities | Performance Indicator: Zero direct discharge of greywater or sludge into Badagry Creek.
- **Aquatic Ecology & Ecosystem Services:** Preservation of mangrove root systems and creek water quality to safeguard local fish-breeding habitats and artisanal fishing ecosystem services | Performance Indicator: Stable fish catch baseline indices; zero degradation of protected mangrove perimeter.

Commented [SA69]: Consider including waste management i.e. solid, sludge waste and waste water. Also, spill management from chemicals etc. How is the aqua ecology and ecosystem services going to be protected through the project cycle? Overall, should be reflective of the quantifiable significant impacts captured.

Commented [Ma70R69]: Addressed

B. Social Management: GBV/SEA/SH Action Plan implementation (reflecting High programme-flagged risk); dedicated cultural heritage protocol for the "Point of No Return" and Spirit Attenuation Well (100% compliance, zero unauthorised disturbance).

C. Health & Safety Management: Waterborne-transit OHS (life jackets, safe boarding); emergency spill response (≤ 30 minutes); chemical and hazardous waste handling safety.

D. Monitoring Indicators: Asbestos air monitoring continuous; mangrove buffer integrity weekly (GPS verification); weekly noise monitoring; monthly GBV training records; heritage-site inspection per works phase; monthly water quality and waste audit logs.

E. Responsibilities: Specialist contractor (asbestos abatement); Contractor (mangrove buffer, spill prevention, waterborne safety, waste handling); PIU (GBV oversight, heritage-protocol compliance, cultural liaison); IESM (compliance verification).

7.2.3 Site-Specific ESMP for Agboyi

Commented [SA71]: Ditto.

Commented [Ma72R71]: Addressed

A. Biophysical Management

- **Mangrove/Critical Habitat Disturbance:** Strict buffer maintenance; biodiversity offset if unavoidable | Performance Indicator: No unauthorised clearing; offset plan approved.
- **Extreme Fluvial Flood Risk:** Elevated foundations; flood barriers for critical equipment and material storage areas | Performance Indicator: Zero flood-related damage during works.
- **Ogun/Maidan River Contamination & Spill Risk:** Sediment traps; bunded barge and on-site fuel/chemical storage (110% capacity); mandatory spill kits | Performance Indicator: TSS ≤ 30mg/L; zero chemical or fuel spills.
- **Waste Management:** Comprehensive solid waste management plan; containment and pump-out of sewage/wastewater; strict prohibition of direct dumping into the Ogun/Maidan River system | Performance Indicator: 100% tracked waste removal to designated municipal sites; zero riverine waste disposal incidents.
- **Aquatic Ecology & Ecosystem Services:** Protection of riverine wetland buffers and maintenance of water filtration functions to sustain local aquatic biodiversity and community water-use services | Performance Indicator: No net loss of functional wetland buffer area; zero toxic runoff exceedances.

B. Social Management: RAP implementation and verification (compensation complete before site clearing); GBV/SEA/SH Action Plan (High programme-flagged risk).

C. Health & Safety Management: Waterborne-transit OHS; flood-contingency emergency response plan; hazardous materials and chemical safety management.

D. Monitoring Indicators: RAP compensation verification (independent monitor sign-off); flood events log (after any significant rainfall); mangrove buffer integrity weekly; weekly noise monitoring; monthly GBV training records; routine water quality and waste manifest checks.

E. Responsibilities: PIU (RAP delivery and verification, GBV oversight); Contractor (flood-resilient construction, waterborne safety, sediment and waste control); IESM (RAP and compliance verification).

7.3 ESMP Summary Matrix (Three PHC Sites)

Table 7.4: ESMP Summary Matrix

Colour Codes: ● Critical □ Major □ Moderate □ Minor ● Positive

Site	Impact Category	Key Unmitigated Impact	Mitigation Measure	Significance	Responsible
Ibereko	Biophysical	Asbestos exposure	Licensed abatement	●	Specialist
Ibereko	Biophysical	Structural failure (damp)	Damp-proof remediation	□	Contractor
Gberefu	Biophysical	Asbestos exposure	Licensed abatement	●	Specialist
Gberefu	Biophysical	Mangrove disturbance	Buffer; offset	□	PIU
Gberefu	Social	GBV/SEA/SH (High)	Training; confidential GRM	□	PIU/Contractor
Gberefu	Social	Cultural heritage	Dedicated protocol	□	Contractor/CLO
Agboyi	Social	Resettlement (2 PAPs)	RAP compensation	□	PIU

Agboyi	Biophysical	Extreme fluvial flooding	Elevated foundations	●	PIU/Contractor
Agboyi	Social	GBV/SEA/SH (High)	Training; confidential GRM	□	PIU/Contractor

7.4 Institutional Responsibilities

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This section defines the institutional roles required to implement the ESMP across the three PHC sites. Clear responsibilities ensure accountability, regulatory compliance, and effective environmental and social performance throughout all project phases.

The ESMP involves coordinated action among federal and state regulators, the PIU, contractors, facility operators, and independent monitors.

Entity	Role	Key Responsibilities
FMEnv	Federal regulator	EIA certification, compliance inspections
NESREA	National environmental regulator	Federal environmental standards enforcement, national compliance monitoring, and hazardous waste regulations
LASEPA	State regulator	Permits, inspections
LAWMA	Waste regulator	Barge-to-Truck medical waste manifest oversight
PIU (LSMoH)	ESMP oversight	Contractor compliance, GRM, RAP oversight (Agboyi), reporting to AfDB
Contractor(s)	ESMP implementation	CESMP, monitoring, OHS, GBV, waterborne safety, community liaison
Facility Operator	Operational ESMP	HMWMP, IPC, wastewater, GRM
Licensed Asbestos Contractor	Hazardous materials	Survey, abatement, monitoring, disposal (Ibereko, Gberefu)
IESM	Independent oversight	Quarterly audits, RAP verification (Agboyi)
Badagry LGA / Kosofe LGA	Local support	Community entry, PAP verification, GRM – coordination required across both jurisdictions
AfDB	Financier	Safeguard supervision

7.4.1 Detailed Roles and Responsibilities

A. PIU (Lagos State Ministry of Health)

The PIU ensures full ESMP implementation, regulatory compliance, and reporting. Key responsibilities include:

- Enforcing ESMP, CESMP, RAP, HMWMP, GBV Action Plan
- Managing GRM and stakeholder engagement
- Ensuring contractors meet E&S obligations
- Coordinating with regulators
- Overseeing climate-resilient design (flooding at Magbon and Idaso; heat resilience at Idotun)
- Reporting to AfDB and FMEnv
- Capacity building for facility operators

B. Contractor(s)

Contractors implement day-to-day ESMP actions during construction. Key responsibilities include:

- Preparing CESMP
- Conducting air, noise, water monitoring
- Implementing dust, noise, erosion, spill, and waste controls
- Managing labour influx, OHS, GBV, traffic
- Reporting incidents within 24 hours
- Maintaining community liaison

C. Facility Operator (Operational Phase)

Operators ensure ESMP compliance during facility operation. Key responsibilities include:

- Implementing HMWMP and IPC
- Managing wastewater and energy systems (including solar PV)
- Maintaining facility infrastructure
- Operating GRM
- Reporting quarterly to PIU

D. Independent Environmental & Social Monitor (IESM)

The IESM provides independent oversight. Key responsibilities include:

- Quarterly audits

- Compliance verification
- Non-compliance reporting
- Effectiveness assessment
- RAP verification (Magbon and Idotun)
- Reporting to AfDB

7.5 Monitoring Plan (Summary)

Monitoring indicators cover air quality, noise (addressing the confirmed baseline exceedances at Ibereko SP2, Gberefu SP1, and all Agboyi points), water quality (Badagry Lagoon and Ogun/Maidan River), mangrove/habitat integrity, RAP compliance (Agboyi), and GBV/SEA/SH training and case resolution, selected against the Chapter 5 risks.

Monitoring Locations: Ibereko; residences adjacent to the asbestos-suspected roofing; Gberefu; mangrove buffer boundary, Badagry Lagoon downstream sampling points, the "Point of No Return"/Spirit Attenuation Well perimeter; Agboyi; riparian buffer boundary, Ogun/Maidan River downstream sampling points, flood-monitoring gauge.

Corrective Action Procedure: Identify exceedance -> notify PIU (24/48 hours) -> investigate root cause -> immediate corrective action -> long-term corrective plan if structural -> verify via follow-up monitoring -> report to AfDB for serious/repeated exceedances -> update ESMP if systemic.

7.6 Environmental & Social Management Actions

This section consolidates all ESMP actions across biophysical, social, and health & safety domains for the three PHC sites.

7.6.1 Biophysical Management Actions

Actions to protect mangrove/riparian ecosystems, air quality, soil, water, biodiversity, and hazardous materials. Examples:

- Asbestos abatement (Ibereko, Gberefu)
- Mangrove buffers and biodiversity offsets (Gberefu, Agboyi)
- Badagry Lagoon / Ogun-Maidan River water protection (Gberefu, Agboyi)
- Flood-resilient foundations and drainage (Agboyi)
- Structural rising-damp remediation (Ibereko, Gberefu)
- Dust/noise control (all sites)

7.6.2 Social Management Actions

Actions to protect livelihoods, manage labour influx, prevent GBV/SEA/SH, and safeguard cultural heritage. Examples:

- Resettlement Action Plan implementation (Agboyi)
- Zero-Camp workforce and labour influx management (all sites)
- GBV/SEA/SH Action Plan (priority at Gberefu and Agboyi, programme-flagged High risk)
- Dedicated cultural heritage protection protocol – "Point of No Return" and Spirit Attenuation Well (Gberefu)

7.6.3 Health & Safety Management Actions

Actions to protect workers and communities from OHS risks. Examples:

- Asbestos OHS controls (Ibereko, Gberefu)
- Waterborne-transit safety – life jackets, safe boarding procedures (Gberefu, Agboyi)
- Flood-contingency emergency response (Agboyi)
- Emergency spill response for barge fuel (Gberefu, Agboyi)
- Community safety fencing (all sites)

7.7 Stakeholder Engagement & GRM

Stakeholder engagement ensures transparency and community participation. The GRM provides accessible channels for resolving grievances.

7.7.1 Stakeholder Engagement

Engagement activities include consultations, disclosure meetings, and community liaison. Actions:

- Quarterly community meetings with the Obas, Baales, and residents of Ibereko, Gberefu, and Agboyi
- Disclosure of the refurbishment schedule and, where applicable, the asbestos removal schedule (Ibereko, Gberefu)
- Engagement with fishers, boat operators, and the Agboyi RAP-affected kiosk operator
- Engagement with traditional authorities on protection of the "Point of No Return" and Spirit Attenuation Well (Gberefu)

7.7.2 Grievance Redress Mechanism (GRM)

The GRM provides confidential, accessible, and timely resolution of grievances. Features:

- Multiple entry points (hotline, suggestion boxes, Community Liaison Officers)

- GBV-sensitive, confidential reporting pathways, with CLO-facilitated access at Gberefu and Agboyi given their barge/canoe-only accessibility
- Traditional rulers (Obas, Baales) as the first point of contact, reflecting a culturally appropriate design for the axis's riverine and island communities
- Acknowledgement within 48 hours
- Resolution within 14 days
- Monthly reporting to AfDB

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7.8 Capacity Building & Training

7.8.1 Training Needs Assessment

Table 7.5– Training Needs Assessment (Badagry Axis)

Target Group	Training Topic	Priority	Duration	Frequency	Responsible
PIU Staff	AfDB ISS (OS1–OS5)				
	ESMP implementation (monitoring, reporting, corrective actions)	High	2 days	Once (pre-construction)	ESIA consultant
	GRM management (tracking, resolution, GBV-sensitive)	High	1 day	Once (pre-construction)	ESIA consultant
	GBV/SEA/SH prevention and response (Chapter 9)	High	1 day	Once (pre-construction) + refresher annually	GBV Specialist
	RAP implementation	High	2 days	Once (pre-construction)	RAP consultant

	(compensation, livelihood restoration, vulnerable groups) – Agboyi, Gberefu, Ibereko				
	Environmental monitoring (air, noise, water)	Medium	1 day	Once (pre-construction)	Environmental specialist
Contractor Staff (including subcontractors)	ESMP / CESMP (mitigation measures, monitoring, reporting)	High	1 day	Induction (before start) + quarterly refresher	Contractor E&S Officer / PIU
	OHS (hazard identification, PPE, working at height, electrical safety, manual handling, heat stress, first aid)	High	1 day	Induction + monthly toolbox talks	Contractor OHS Officer
	GBV/SEA/SH prevention (Code of Conduct, reporting,	High	0.5 day	Induction + monthly refresher	GBV Specialist / Contractor

	survivor support)				
	Asbestos awareness (Gberefu, Ibereko – if confirmed)	High	0.5 day	Induction (before asbestos abatement)	Licensed abatement contractor
	Spill response (spill kit use, containment, reporting)	Medium	0.5 day	Induction + annual refresher	Contractor HSE Officer
	Waste management (segregation, manifests, asbestos handling)	Medium	0.5 day	Induction	Contractor E&S Officer
	Community liaison and GRM (how to interact with community, respond to grievances)	Medium	0.5 day	Induction	Contractor / PIU
Facility Operators (clinical and non-clinical staff)	HMWMP (healthcare waste segregation, handling, PPE, spill response)	High	1 day	Induction (before operation) + annual refresher	Facility operator / PIU

	IPC (hand hygiene, sterilization, isolation, cleaning, surveillance)	High	1 day	Induction + annual refresher	IPC specialist / Facility operator
	GBV/SEA/SH (Chapter 9) – awareness, reporting, survivor support	High	0.5 day	Induction + annual refresher	GBV Specialist / PIU
	GRM (facility-level – how to receive and resolve grievances)	Medium	0.5 day	Induction	PIU
	Fire safety and emergency response	Medium	0.5 day	Induction + annual drill	Facility operator
Community (leaders, women's groups, youth)	GBV/SEA/SH awareness (prevention, reporting, survivor support)	High	0.5 day	Quarterly (during construction) + annually (operation)	GBV Specialist / PIU / Contractor
	GRM (how to submit grievances, confidentiality, no retaliation)	High	0.5 day	Quarterly (during construction) + annually (operation)	PIU / Community liaison

	Construction hazards (stay away from site, report safety concerns)	Medium	0.5 day	Before construction starts (community meeting)	Contractor / PIU
	Health awareness (HIV/AIDS, STIs, malaria, hygiene)	Medium	0.5 day	Quarterly (during construction)	Contractor / PIU / LGA health department

7.8.2 Training Schedule

Table 7.6 – Training Schedule (Gantt Chart – Badagry Axis)

Phase	Training Topic	Target Group	Timeline	Responsible	Venue
Pre-construction (Month 1-3)	AfDB ISS, ESMP, GRM, GBV, RAP	PIU staff	Month 1	ESIA consultant / AfDB	PIU office
	CESMP, OHS, GBV, spill response, waste, community liaison	Contractor staff (induction)	Before mobilization (Month 2-3)	Contractor / PIU	Contractor site office
	GBV awareness, GRM	Community leaders	Month 2-3	PIU / GBV Specialist	Community hall
Construction (Ongoing)	Monthly toolbox talks (OHS, GBV, spill response, etc.)	Contractor staff	Monthly	Contractor	Site

	Quarterly GBV awareness	Community	Quarterly	PIU / GBV Specialist	Community hall
	Quarterly health awareness (HIV/AIDS, STIs)	Contractor staff + community	Quarterly	Contractor / PIU / LGA health department	Site / Community hall
Pre-operation (Month before opening)	HMWMP, IPC, GBV, GRM, fire safety	Facility operators (clinical and non-clinical)	Month before operation	PIU / IPC specialist / GBV Specialist	Facility
Operation (Ongoing)	Annual refresher: HMWMP, IPC, GBV	Facility operators	Annually	Facility operator / PIU	Facility
	Annual GBV awareness	Community	Annually	PIU / GBV Specialist	Community hall

7.8.3 Training Records

All training shall be documented with:

- **Attendance register** (name, signature, date, training topic)
- **Training materials** (presentation slides, handouts)
- **Trainer qualifications** (CV, certification)
- **Evaluation** (pre- and post-training quiz, feedback form)

Training records shall be maintained by PIU and available for inspection by AfDB, FMEnv, LASEPA, and IESM, and the Lagos State Safety Commission

7.9 Reporting Framework

Reporting ensures accountability and continuous improvement.

Reporting Requirements

- Contractor -> PIU: Weekly E&S reports
- Facility Operator -> PIU: Quarterly operational reports

- PIU -> AfDB/FMEnv: Quarterly and annual reports, with explicit coordination across both Badagry LGA and Kosofe LGA
- IESM -> AfDB: Quarterly audit reports, including RAP verification (Agboyi)

Reports include: monitoring data; GRM statistics; incidents and corrective actions; compliance status; training records; Barge-to-Truck waste-manifest completeness.

7.10 ESMP Budget & Implementation Schedule

7.10.1 Introduction to ESMP Budget

The ESMP budget provides the financial resources required to implement environmental, social, health, and safety mitigation measures across the three PHC sites in the Badagry Axis (Group 8). Costs are estimated based on Nigerian market rates, AfDB safeguard requirements, and typical ESMP implementation budgets for similar health infrastructure projects, and are presented in US Dollars (USD), consistent with the axis's own budgeting convention established in the Executive Summary.

The budget covers: environmental monitoring (air, noise, water); social mitigation (RAP, GBV/SEA/SH prevention, stakeholder engagement); health and safety management (OHS, waterborne-transit safety, asbestos PPE); waste management (Barge-to-Truck system, hazardous waste disposal); biodiversity and mangrove protection; capacity building; independent monitoring (IESM); and contingencies.

7.10.2 Costed ESMP Budget Table (Three PHC Sites – Badagry Axis, Group 8)

Table 7.7: Costed ESMP Budget Table

ESMP Component	Description	Estimated Cost (USD)	Responsible
Air Quality Monitoring	PM10/PM2.5 sampling (Ibereko, Gberefu, Agboyi)	$12,000	Contractor / PIU
Noise Monitoring	Sound-level meters + weekly monitoring, priority at all 3 sites given confirmed baseline exceedances	$10,000	Contractor
Water Quality Monitoring	Monthly lab analysis, Badagry Lagoon and Ogun/Maidan River (TSS, pH, hydrocarbons, coliforms)	$14,000	Contractor

Asbestos Survey & Abatement	Licensed survey, wet removal, HEPA vacuums, air monitoring, disposal (Ibereko, Gberefu only)	$55,000	Specialist Contractor
Mangrove Buffer & Biodiversity Offset	Buffer demarcation, confirmatory ecological surveys, offset plan (Gberefu, Agboyi)	$45,000	PIU
Waterborne Logistics & Safety	Barge/canoe safety equipment, life jackets, waterborne-transit training, secondary fuel containment	$18,000	Contractor
Barge-to-Truck Waste-Transfer System	Mainland transfer-point setup, manifest system, chain-of-custody training	$15,000	Facility Operator / LAWMA
Structural Remediation (Rising Damp)	Damp-proof course remediation, structural repair (Ibereko, Gberefu)	$20,000	Contractor
Flood-Resilient Design (Agboyi)	Elevated foundations, flood barriers for critical equipment	$22,000	PIU / Design Contractor
Cultural Heritage Protection Protocol	Dedicated protocol for the “Point of No Return” and Spirit Attenuation Well, traditional-authority liaison	$8,000	Contractor / CLO
GBV/SEA/SH Action Plan	Training, GBV Specialist input, confidential CLO-facilitated GRM, referral pathway MOUs – priority at Gberefu/Agboyi	$16,000	PIU / Contractor
Stakeholder Engagement & GRM	Quarterly meetings, disclosure, hotline, suggestion boxes, CLOs across both LGAs	$9,000	PIU
Capacity Building & Training	ESMP, OHS, GBV, IPC, asbestos, waterborne safety, flood-contingency training	$12,000	PIU

IESM Audits	Independent quarterly audits, including RAP verification at Agboyi (3 sites x 4 audits/year)	$18,000	IESM (funded by PIU)
Contingency (~10%)	Unforeseen environmental and social management costs	$29,000	PIU
Subtotal (ESMP, excluding RAP)		**~$303,000 – $315,000**	

7.10.2 Budget Verification Statement

The ESMP budget presented in Section 7.10.2 has been developed specifically for the three PHC facilities in the Badagry Axis (Group 8). The budget (~USD 315,000, excluding the separately budgeted Agboyi RAP) is justified by the following site-specific factors:

1. Asbestos Abatement (Ibereko and Gberefu Only)

- Ibereko PHC: suspected asbestos in old roofing sheets
- Gberefu PHC: suspected asbestos in old roofing sheets
- Agboyi PHC: not flagged for asbestos in the axis baseline – no abatement cost allocated
- Licensed survey, wet removal, air monitoring, and hazardous waste disposal at the two affected sites

2. Mangrove and Critical Habitat Protection (Gberefu and Agboyi)

- Both sites classified as Likely Critical Habitat (red mangrove, *Rhizophora racemosa*)
- 50 m buffer demarcation, confirmatory ecological surveys, and biodiversity offset plan (1:1-3:1 if unavoidable)
- Storm-surge shoreline stabilisation at Gberefu; riparian margin protection at Agboyi

3. Waterborne Logistics (Gberefu and Agboyi)

- Both sites accessible only by motorized barge/canoe – no road access
- Safety equipment, training, and the Barge-to-Truck waste-transfer system are costs unique to this axis, not required at road-accessible sites such as Ibereko

4. Structural Remediation (Ibereko and Gberefu)

- Both facilities affected by rising damp and general structural deterioration
- Damp-proof course remediation and structural repair required before clinical operations can safely resume

5. Extreme Flood Resilience (Agboyi)

- Fluvial flooding to water levels of up to 5 m during peak flood events
- Elevated foundations and flood barriers for critical equipment, distinct from and in addition to the axis's standard climate-resilient design package

6. Resettlement (Agboyi Only)

- One commercial kiosk operator, water-locked access
- RAP budgeted separately at full replacement cost, not included in the ESMP total above

7. GBV/SEA/SH Priority (Gberefu and Agboyi)

- Both sites independently flagged programme-wide as High GBV/SEA/SH risk
- Enhanced training frequency and CLO-facilitated confidential reporting given physical isolation

8. Cultural Heritage (Gberefu)

- The "Point of No Return" (historic trans-Atlantic slave-trade departure site) and the Spirit Attenuation Well require a dedicated protection protocol beyond the standard Chance Finds Procedure

Cost Breakdown Summary

Cost Item	**Estimated Cost (USD)**	**Justification**
Asbestos survey and abatement (Ibereko, Gberefu)	$55,000	Licensed survey, wet removal, monitoring, disposal – 2 of 3 sites only
Mangrove/Critical Habitat protection (Gberefu, Agboyi)	$45,000	Buffer, surveys, offset plan
Waterborne logistics and safety	$18,000	Barge/canoe safety equipment and training
Barge-to-Truck waste-transfer system	$15,000	Mainland transfer point, manifest chain of custody
Structural remediation (rising damp)	$20,000	Damp-proof course, structural repair
Flood-resilient design (Agboyi)	$22,000	Elevated foundations, flood barriers
Cultural heritage protection (Gberefu)	$8,000	Dedicated protocol, traditional-authority liaison

GBV/SEA/SH Action Plan	$16,000	Training, CLO-facilitated GRM, referral MOUs
Monitoring (air, noise, water)	$36,000	Equipment, sampling, analysis, 3 sites
Stakeholder engagement & GRM	$9,000	Quarterly meetings, disclosure, hotline
Capacity building & training	$12,000	ESMP, OHS, GBV, waterborne safety
IESM audits	$18,000	Quarterly audits, RAP verification
Contingency (~10%)	$29,000	Unforeseen E&S management costs
TOTAL (ESMP, excluding RAP)	**~$303,000-$315,000**	

TOTAL ESTIMATED ESMP COST (THREE PHC SITES – BADAGRY AXIS, GROUP 8) Approximately USD 315,000 – Refurbishment Phase (excluding the separately budgeted Agboyi RAP)

7.10.3 Implementation Schedule (Summary)

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Table 7.8: Implementation Schedule

Project Phase	Key Milestone / Action Item	Target Timing / Duration	Responsible Entity / Stakeholder
Pre-Refurbishment	• Agboyi RAP compensation complete before site clearing • Asbestos surveys conducted at Ibereko and Gberefu • Mangrove Critical Habitat confirmatory surveys at Gberefu and Agboyi • Barge-to-Truck LAWMA agreement finalized • CESMP approval secured	Prior to mobilization and civil works	PIU, Contractor, LAWMA, Independent Monitor
Refurbishment	• Full ESMP implementation and	12–18 months per facility (staggered schedule)	Contractor, PIU, Facility Operator, IESM

	monitoring across active worksites		
Operation	• HMWMP (Barge-to-Truck system live) • IPC (Infection Prevention and Control) implementation • Wastewater management operations • Solar-hybrid performance monitoring	Operational phase commencement	Facility Operator, LAWMA, PIU
Annual	• ESMP review and update • Cross-jurisdictional coordination between Badagry LGA and Kosofe LGA	Annually throughout the operational lifecycle	PIU, LGA Health Authorities, Facility Management

7.10.3 Resource Requirements

Table 7.9 – Resource Requirements

Resource	Quantity	Purpose	Responsible
PIU E&S staff	Minimum 2 (1 environmental, 1 social) – full-time	Oversee ESMP implementation, GRM, reporting	LSMoH / PIU
Contractor E&S staff	Minimum 1 E&S Officer per site (or per cluster)	Day-to-day CESMP implementation, monitoring, reporting	Contractor
Community Liaison Officer	Minimum 1 per cluster (1 for Badagry Axis)	Community engagement, GRM, grievance resolution	Contractor / PIU
IESM	1 firm (3–5 auditors)	Quarterly audits, compliance verification	PIU (contracted)

Environmental monitoring equipment	Real-time air monitors (2–3), sound level meters (2–3), water quality meters (2), GPS (2)	Monitoring	Contractor (rent or purchase)
Laboratory services	FMEnv-accredited laboratory	Water, soil, air analysis	Contractor (contracted)
Training facilities	Venue, projector, materials	Training (PIU, contractors, facility operators)	PIU

7.11 Emergency Preparedness and Response Plan (EPRP)

7.11.1 Emergency Scenarios

Table 7.10 – Emergency Scenarios

Emergency Scenario	Likelihood	Potential Consequences	Affected Sites	Responsible
Fire (Construction or Facility)	Medium (Construction – electrical, welding, fuel storage; Operation – kitchen, electrical, incinerator)	Injury, fatality, property damage, service disruption	All 3 sites (Ibereko, Gberefu, Agboyi)	Contractor (construction); Facility operator (operation)
Flood (Heavy rain, high water table, coastal surge)	High (Rainy season April–October; high-risk due to shallow water table and coastal proximity)	Facility inundation, equipment damage, service disruption, injury	Gberefu, Agboyi (Riverine/Coastal sites)	Contractor (construction – temporary drainage); Facility operator (operation – flood barriers,

				elevated electricals)
Medical Emergency (Worker or community injury)	Medium (Construction – OHS risks; Operation – clinical emergencies)	Injury, fatality	All 3 sites	Contractor (first aid, transport to clinic); Facility operator (clinical care)
Chemical/Fuel Spill (Fuel, oil, or lab chemicals)	Medium (Construction – fuel storage; Operation – laboratory)	Environmental contamination (soil, water), injury; Aquatic pollution risk for riverine sites	Gberefu, Agboyi (Specifically near water bodies)	Contractor (spill kit, containment); Facility operator (spill kit, containment)
Asbestos Release (Refurbishment phase)	Low (If proper abatement) but High Consequence	Worker/community exposure to airborne fibres → long-term health risks (cancer)	Ibereko, Gberefu, Agboyi (Potential during refurbishment of older structures)	Licensed abatement contractor
GBV Incident (SEA, SH, GBV in community)	Medium to High (If no mitigation)	Survivor trauma, community protest, project shutdown	All 3 sites (Especially where labour influx is present)	Contractor (worker Code of Conduct); PIU (GBV Action Plan, referral pathways)
Community Protest (Employment, GRM, or logistics)	Medium (Related to local employment or transport logistics)	Project shutdown, property damage, reputational damage	Gberefu, Agboyi (High visibility in riverine/coastal communities)	PIU (GRM, community liaison, stakeholder engagement)

Security Incident (Theft, vandalism, piracy)	Medium (Theft of materials/solar panels; riverine transport safety)	Property loss, injury, project delay	All 3 sites (Especially Gberefu due to water-bound logistics)	Contractor (security guards, fencing, lighting); PIU (coord
Emergency Scenario	Likelihood	Potential Consequences	Affected Sites	Responsible
Fire (construction site, facility)	Medium (construction – electrical, welding, fuel storage; operation – kitchen, electrical, incinerator)	Injury, fatality, property damage, service disruption	All 3 sites (Ibereko, Gberefu, Agboyi)	Contractor (construction); Facility operator (operation)
Flood (heavy rain, blocked drains)	High (rainy season April–October; high-risk sites: 3 Agboyi, Ibereko, Gberefu	Facility inundation, equipment damage, service disruption, injury	Agboyi, Ibereko, Gberefu	Contractor (construction – temporary drainage); Facility operator (operation – flood barriers, elevated electricals)
Medical emergency (worker injury, community member injury)	Medium (construction – OHS risks; operation –	Injury, fatality	All 3 sites	Contractor (first aid, transport to clinic); Facility operator (clinical care)

	clinical emergencies)			
Chemical spill (fuel, oil, chemicals)	Medium (construction – fuel storage; operation – laboratory)	Environmental contamination (soil, water), injury	All 3 sites (especially Agboyi, Gberefu – near water)	Contractor (spill kit, containment); Facility operator (spill kit, containment)
Asbestos release (Ibereko, Agboyi – during abatement if containment fails)	Low (if proper abatement) but high consequence	Worker/community exposure to airborne fibres → cancer (20–40 years latency)	Ibereko, Agboyi (if confirmed)	Licensed abatement contractor
GBV incident (SEA, SH, GBV in community)	Medium to High (if no mitigation)	Survivor trauma, STI, pregnancy, community protest, project shutdown	Gberefu, Agboyi, Ibereko (labour influx)	Contractor (worker Code of Conduct); PIU (GBV Action Plan, referral pathways)
Community protest (over resettlement – Agboyi, GBV; asbestos; employment)	Medium (especially at Agboyi – 2 PAPs)	Project shutdown, property damage, injury, reputational damage	Agboyi	PIU (RAP implementation, GRM, community liaison)

Security incident (theft, vandalism, armed robbery)	Medium (theft/vandalism – all sites; armed robbery – urban sites – Agboyi, Ibereko, Gberefu)	Property loss, injury, project delay	All 3 sites (especially Agboyi, Ibereko, Gberefu – urban)	Contractor (security guards, fencing, lighting); PIU (coordination with police)

7.11.2 Emergency Response Procedures

A. Fire Emergency

Step	Action	Responsible
1	Raise alarm (shout, fire alarm bell, call "Fire!")	Anyone
2	Evacuate building/area (assembly point)	All personnel
3	Call fire service (LASG Fire Service: 112)	Site supervisor
4	Attempt to extinguish small fire (if trained, using appropriate extinguisher – water for wood/paper, CO2 for electrical, dry powder for fuel)	Trained fire marshal
5	Do not enter if fire large or smoke thick	All personnel
6	Account for all personnel (roll call at assembly point)	Site supervisor
7	First aid for injured (burns, smoke inhalation)	First aider
8	Report to PIU and AfDB (within 24 hours)	Contractor / PIU

B. Flood Emergency

Step	Action	Responsible
1	Monitor weather forecast (rainy season)	Site supervisor
2	If heavy rain forecast, prepare: move equipment to higher ground, deploy flood barriers (if available), clear drains	Site supervisor
3	If flooding occurs: shut off electrical supply (main breaker)	Electrician
4	Evacuate to higher ground (assembly point)	All personnel

5	Do not walk or drive through floodwater (depth unknown, hidden hazards, electrical risk)	All personnel
6	After flood: inspect building (structural damage, electrical safety), pump out water (if safe), clean and disinfect (mud, sewage), inspect equipment (damage)	Site supervisor / Facility operator
7	Report to PIU and AfDB (within 24 hours)	Contractor / PIU / Facility operator

C. Chemical Spill (Fuel, Oil, Chemicals)

Step	Action	Responsible
1	Evacuate area (10 m radius)	Anyone
2	Wear PPE (gloves, goggles, coverall, respirator if volatile)	Spill responder
3	Contain spill (spill kit – absorbent booms around spill, socks to prevent spread)	Spill responder
4	Absorb spill (absorbent pads, granules)	Spill responder
5	Collect contaminated absorbent in hazardous waste bag (labeled)	Spill responder
6	Dispose through licensed hazardous waste contractor	Contractor
7	If spill reached water body, notify LASEPA and NOSDRA (within 24 hours)	Contractor / PIU
8	Report to PIU and AfDB (within 24 hours)	Contractor

D. GBV Incident

Step	Action	Responsible
1	Ensure survivor safety (separate from perpetrator, safe space)	Any staff
2	Provide immediate medical care (if injuries) – refer to clinic/hospital (within 72 hours for PEP for HIV)	First aider / Facility operator
3	Inform GBV Specialist or female GRM focal point (confidentially)	Any staff
4	Offer psychosocial support (counselling) – refer to service provider (MIRA, Mirabel Centre, LASG Ministry of Women Affairs)	GBV Specialist

5	Offer legal support (if survivor wishes to pursue legal action) – refer to legal aid (LASG, NGO)	GBV Specialist
6	Investigate (without requiring survivor to provide evidence if they choose not to)	PIU / Contractor
7	Sanction perpetrator (warning, suspension, termination, legal prosecution)	Contractor / PIU
8	Report to AfDB (within 48 hours for serious incident – sexual violence)	PIU
9	Do not retaliate against survivor (zero tolerance)	All personnel

E. Asbestos Release (Ibereko, Agboyi – if confirmed)

Step	Action	Responsible
1	Stop work immediately	Site supervisor
2	Evacuate area (100 m radius)	Site supervisor
3	Wear PPE (Type 5 coverall, P3 respirator)	Licensed abatement contractor
4	Improve containment (negative pressure enclosure, HEPA filtration)	Licensed abatement contractor
5	Air monitoring (PCM) – action level 0.1 f/ml	Licensed air monitoring consultant
6	If levels exceed 0.1 f/ml, continue containment improvements	Licensed abatement contractor
7	Notify PIU, LASEPA, and NESREA	PIU
8	Medical surveillance for exposed workers (chest X-ray, lung function)	Occupational health physician
9	Report to AfDB (within 24 hours)	PIU

7.11.3 Emergency Equipment and Supplies

Table 7.11 – Emergency Equipment and Supplies (Badagry Axis – per site)

Equipment/Supply	Quantity per Site (Construction)	Quantity per Facility (Operation)	Responsible	Inspection Frequency

Fire extinguisher (appropriate type – water, CO2, dry powder)	2–5 (depending on site size)	5–10 (depending on facility size)	Contractor / Facility operator	Monthly
First aid kit (stocked – bandages, antiseptic, gloves, etc.)	1 per 50 workers	1 per floor/department	Contractor / Facility operator	Weekly
Spill kit (absorbent pads, booms, socks, PPE, disposal bags)	1 per fuel storage area, 1 per refuelling point	1 per lab, 1 per chemical storage area	Contractor / Facility operator	Monthly
Emergency shower and eyewash station	1 per chemical storage area	1 per lab, 1 per chemical storage area	Contractor / Facility operator	Monthly
Emergency contact list (posted)	1 per site (posted in visible location)	1 per facility (posted)	Contractor / Facility operator	Quarterly (update)
Assembly point (designated, marked)	1 per site	1 per facility	Contractor / Facility operator	N/A
Emergency lighting (battery backup)	Not required (construction – daytime only)	Required (exit signs, emergency lights)	Facility operator	Monthly
Alarm system (fire alarm bell, siren)	1 per site	1 per facility	Contractor / Facility operator	Monthly (test)

7.11.4 Emergency Drills

Table 7.12 – Emergency Drills (Badagry Axis)

Drill Type	Frequency	Participants	Responsible
Fire drill	Quarterly (construction); annually (operation)	All workers (construction); all facility staff (operation)	Contractor (construction); Facility operator (operation)

Spill drill	Annually (construction)	Spill responders	Contractor
Evacuation drill	Annually (construction)	All workers	Contractor
GBV response drill (simulated referral)	Annually (construction, operation)	GRM focal points, GBV Specialist, service providers	PIU / GBV Specialist
Flood drill	Annually (before rainy season – March)	All workers (construction); facility staff (operation)	Contractor / Facility operator

Table 7.13 – Emergency Contact List (Example – Badagry Axis – to be completed for each site)

Emergency Service	**Contact Number**	**Location (nearest station/facility)**	**Notes**
Fire Service (LASG)	112	Nearest fire station (e.g., Badagry, Ikeja)	National emergency number
Police	112	Nearest police station	National emergency number
Ambulance (LASG)	112	Nearest hospital with ambulance (e.g., Badagry General Hospital)	National emergency number
LASEPA (emergency – pollution)	*TBD*	LASEPA head office, Ikeja	For chemical spills, air pollution complaints
NOSDRA (spill reporting)	*TBD*	Lagos office	For oil/fuel spills (mandatory reporting)
PIU Safeguards Team	*TBD*	Alausa, Ikeja	24-hour contact (to be established)
GBV referral – medical (within 72 hours)	*TBD*	Badagry General Hospital (for PEP, STI treatment)	Nearest general hospital with PEP

GBV referral – psychosocial	*TBD*	Mirabel Centre, Lagos	Counselling
GBV referral – legal	*TBD*	LASG Ministry of Women Affairs	Legal aid
Nearest clinic/hospital	*TBD*	Site-specific (e.g., Badagry General Hospital, local PHC)	For medical emergencies (worker, community)

7.12 ESMP Review and Update Mechanism

7.12.1 Review Triggers

The ESMP shall be reviewed and updated under the following circumstances:

Trigger	**Responsible**	**Timeline**	**Approval Required**
Annual review (scheduled)	PIU (with input from contractors, facility operators, IESM)	Annually (by end of Q1)	AfDB (if significant changes)
After a major incident (fatality, community protest, major spill)	PIU (with IESM)	Within 30 days of incident	AfDB
After a significant change in project scope (new sites, major design changes, new activities)	PIU	Within 30 days of change approval	AfDB
After a change in regulations (FMEnv, NESREA, LASEPA, AfDB ISS update)	PIU	Within 90 days of regulation change	AfDB (if significant)
Based on monitoring results (systematic non-compliance, exceedances not resolved)	PIU (with IESM)	Within 60 days of trend identification	AfDB (if significant)
Based on stakeholder feedback (GRM trends, community complaints)	PIU	Within 60 days of trend identification	AfDB (if significant)

7.12.2 Review Process

Step	Action	Responsible	Timeline
1	Trigger review (as above)	PIU / IESM / AfDB	As needed
2	Assemble review team (PIU E&S staff, contractor E&S officer, facility operator representative, IESM)	PIU	Within 7 days of trigger
3	Review ESMP against: monitoring data (KPIs), incident reports, GRM logs, IESM audit reports, stakeholder feedback, regulatory changes, project changes	Review team	Within 14 days
4	Identify gaps (mitigation measures not effective, new risks, obsolete measures)	Review team	Within 14 days
5	Propose revisions (updated mitigation measures, monitoring indicators, responsibilities, budget)	Review team	Within 21 days
6	Draft revised ESMP	PIU	Within 30 days
7	Submit to AfDB for review (if significant changes)	PIU	Within 7 days of draft completion
8	Approve revised ESMP	AfDB	Within 30 days of submission (if significant changes)
9	Communicate revised ESMP to contractors, facility operators, IESM, regulators	PIU	Within 7 days of approval
10	Update ESMP document (version control)	PIU	Within 7 days of approval

7.12.3 Version Control

Version	Date	Author	Changes	Approval
1.0	March 2026	ESIA consultant (MDS)	Initial ESMP (as part of ESIA)	FMEnv (EIA Certificate), AfDB

1.1	*TBD (after annual review)*	PIU	*TBD*	AfDB (if significant)
...	...	...	...	...

7.13 Contractor ESMS Requirements

7.13.1 Contractor ESMP (CESMP)

All contractors (including subcontractors) must prepare a Contractor Environmental and Social Management Plan (CESMP) based on this ESMP and tailored to their specific site(s) and activities.

CESMP Content Requirements:

Section	Content
Project description	Site(s) (Badagry Axis facilities), scope of work (clearing, earthworks, foundation, structural, MEP, finishing, equipment installation), duration, workforce size
Environmental management	Dust control plan (water spraying frequency, equipment); noise management plan (hours, barriers, notification); water quality protection plan (silt fences, sediment traps, spill prevention, concrete wash water); waste management plan (segregation, recycling, disposal – including asbestos (Ibereko, Gberefu, Agboyi if confirmed)); erosion and sediment control plan (silt fences, check dams, revegetation); spill prevention and response plan (bunded storage, spill kits, training)
Social management	Labour influx management plan (local hiring target (≥50% unskilled), worker accommodation (if camps), community liaison); OHS plan (HIRA, safe work procedures, PPE, training, incident reporting, first aid, medical surveillance); GBV/SEA/SH Action Plan (Code of Conduct, training, confidential reporting, referral pathways, sanctions); community health and safety plan (Traffic Management Plan, access management, community awareness); GRM (worker and community)
Management systems	Roles and responsibilities (designated E&S officer, community liaison officer, OHS officer, GBV focal point (female)); training plan (induction, monthly toolbox talks, specialised training (asbestos, spill response, GBV)); monitoring plan (air, noise, water, waste, OHS, GRM – methods, frequency, locations, corrective action triggers); reporting plan (weekly

	reports to PIU, incident reporting (24 hours)); corrective action procedure; record keeping
Emergency response	EPRP (fire, flood, spill, medical emergency, GBV incident, security incident) – site-specific; emergency equipment (fire extinguishers, first aid kit, spill kit); emergency contacts; drill schedule

7.13.2 CESMP Approval Process

Step	Action	Responsible	Timeline
1	Contractor submits CESMP to PIU	Contractor	At bid stage (or within 2 weeks of contract award)
2	PIU reviews CESMP for completeness and compliance with ESMP	PIU	Within 2 weeks of submission
3	PIU requests revisions (if needed)	PIU	Within 2 weeks
4	Contractor submits revised CESMP	Contractor	Within 1 week of receiving comments
5	PIU approves CESMP (or escalates to AfDB if major gaps)	PIU / AfDB	Within 1 week
6	Contractor mobilises only after CESMP approval	Contractor	N/A

7.13.3 Contractor E&S Performance Monitoring

Indicator	Target	Monitoring Method	Sanction for Non-Compliance
CESMP approval before mobilisation	100%	PIU verification	No mobilisation → project delay
Weekly E&S report submission	100% (on time)	PIU tracking	Warning (first); financial penalty (repeat)
Environmental monitoring (air, noise, water) exceedances	≤5% of samples exceed limits (and corrective actions implemented within 48 hours)	PIU / IESM audit	Warning (first); financial penalty (repeat)

OHS lost-time injury rate	≤2 per 200,000 hours	PIU / IESM audit	Safety stand-down; retraining
GBV incidents	Zero tolerance	PIU / IESM audit (GRM records)	Immediate termination of contract (for perpetrator); financial penalty for contractor (if failure to prevent/enforce Code of Conduct)
Local hiring (unskilled)	≥50% from LGAs	PIU / IESM audit (hiring records)	Financial penalty (if persistent non-compliance)
GRM grievance resolution	≥95% resolved within 14 days	PIU / IESM audit (GRM records)	PIU escalation; financial penalty (if systemic)
Community satisfaction	≥80% satisfied	Community survey (IESM)	Improvement plan required

7.13.4 Sanctions for Contractor Non-Compliance

Non-Compliance Level	**Example**	**Sanction**
Minor (isolated, low impact)	Missed weekly report (late by 1–2 days); PPE non-compliance (1–2 workers, corrected immediately)	Verbal warning; written warning (if repeated)
Moderate (repeated minor, or single moderate impact)	Repeated missed reports; minor spill (contained, reported); exceedance of noise/dust limit (no corrective action)	Written warning; financial penalty (₦500,000 – ₦2 million per incident)
Major (significant impact, or repeated moderate)	Major spill (to water body); fatality; GBV incident (not prevented, not reported, no survivor support); child labour; forced labour;	Financial penalty (₦5 million – ₦20 million per incident); suspension of work (until corrective actions

	community protest due to contractor actions	implemented); termination of contract (for gross negligence)
Critical (willful violation, criminal act)	Asbestos release (willful negligence); sexual violence by contractor employee; bribery/corruption	Immediate termination of contract; legal prosecution; debarment from future AfDB-funded projects

7.14 Conclusion

The Environmental and Social Management Plan (ESMP) provides a comprehensive, practical, and enforceable framework for managing the environmental and social impacts of the Badagry Axis facilities.

Key elements of the ESMP include:

- **Clear institutional responsibilities** – PIU (oversight), contractors (implementation), facility operators (operation), IESM (independent monitoring), regulators (enforcement).
- **Detailed monitoring plan** – 30+ indicators with baselines, targets, methods, frequency, and corrective action triggers, aligned with NESREA and lender limits.
- **Robust reporting framework** – daily logs, weekly reports, monthly reports, quarterly audits, annual performance reports, incident reports (24–48 hours).
- **Specialised management plans** (appendices) covering waste, OHS, traffic, camps, labour influx, GBV, security, chance finds, biodiversity, climate, and more.
- **Realistic budget** (indicative US$303,000–315,000 for Badagry Axis, excluding RAP and asbestos abatement) and resources (PIU E&S staff, contractor E&S officers, IESM, monitoring equipment, training).
- **Capacity building** – training for PIU, contractors, facility operators, and community on ESMP, OHS, GBV, HMWMP, IPC, GRM.
- **Emergency preparedness** – EPRP for fire, flood, spill, medical emergency, GBV, security incident, with emergency equipment, drills, and contact lists.
- **ESMP review and update mechanism** – annual review, plus trigger-based reviews (incidents, scope change, regulation change), with AfDB approval for significant changes.
- **Contractor ESMS requirements** – CESMP (contractor-specific), approval process, performance monitoring, sanctions for non-compliance.

With full implementation of this ESMP, the Badagry Axis facilities will comply with AfDB ISS, FMEnv EIA Act, NESREA regulations, LASEPA requirements, and international good practices (IFC, WHO, ILO), while safeguarding communities, workers, and the environment.

CHAPTER 8 – HAZARDOUS AND MEDICAL WASTE MANAGEMENT, DECOMMISSIONING AND RESTORATION PLAN

8.1 Introduction

This chapter presents the HMWMP and Decommissioning and Restoration Plan for Ibereko, Gberefu, and Agboyi. Given the axis's dependence on waterborne access to two of its three sites, the HMWMP places particular emphasis on the "Barge-to-Truck" (or "Barge-to-Marina") waste-transfer manifest system required to safely move medical and hazardous waste from Gberefu and Agboyi to licensed treatment and disposal facilities. Regulatory compliance follows AfDB ISS OS4, FMEnv National Environmental Regulations, NESREA Hazardous Waste Regulations, the Harmful Waste Act, LASEPA Waste Management Law, LAWMA Healthcare Waste Guidelines, IFC EHS Guidelines, WHO waste management guidance, and ILO OHS Conventions.

8.1.1 The Hazardous and Medical Waste Management Plan (HMWMP)

This plan applies to both the construction/refurbishment phase and the operational phase of the PHCs. It provides a complete system for the segregation, collection, storage, treatment, transport, and disposal of all hazardous and medical waste streams. The HMWMP is designed to protect healthcare workers, patients, waste handlers, and surrounding communities from exposure to infectious, chemical, pharmaceutical, and asbestos-containing waste. It also prevents environmental contamination of soil, groundwater, surface water, and air.

8.1.2 The Decommissioning and Restoration Plan

Although the PHC facilities are expected to operate for 50+ years, the Federal Ministry of Environment (FMEnv) requires that all ESIA reports include a Decommissioning and Restoration Plan. This ensures that, at the end of each facility's life cycle, demolition and site restoration are carried out safely, responsibly, and in compliance with national regulations. The plan covers the removal of hazardous materials (including asbestos), demolition waste management, site rehabilitation, and restoration of ecological and community assets.

8.1.3 Regulatory Compliance

Both the HMWMP and the Decommissioning Plan comply with:

- AfDB ISS (OS4 – Pollution Prevention and Hazardous Materials)
- FMEnv National Environmental Regulations (2009)
- NESREA Hazardous Waste Regulations (2009)
- Harmful Waste Act CAP H1 LFN 2004

- LASEPA Waste Management Law (2017)
- LAWMA Healthcare Waste Guidelines (2019)
- IFC EHS Guidelines for Healthcare Facilities (2012)
- WHO Safe Management of Wastes from Health Care Activities (2014)
- ILO OHS Conventions (155 and 161)

These frameworks ensure that hazardous and medical waste is managed according to international best practice and Nigerian regulatory requirements, and that decommissioning activities do not pose risks to workers, communities, or the environment.

8.1.4 Purpose of Chapter

This chapter provides:

- A complete Hazardous and Medical Waste Management Plan (HMWMP) for all three PHC facilities
- A detailed Asbestos Management Plan for Magbon and Idaso
- A comprehensive Occupational Health and Safety (OHS) framework for waste handlers
- A Spill Response Plan for chemical, infectious, fuel, and asbestos spills
- A Monitoring and Reporting System for waste generation, treatment, and disposal
- A Decommissioning and Restoration Plan required by FMEnv for end-of-life facility management
- Clear roles and responsibilities for all actors (PIU, Facility Operators, LAWMA, LASEPA, Contractors)
- A budget estimate for implementing the HMWMP and decommissioning activities

Together, these components ensure that hazardous and medical waste is managed safely throughout the project lifecycle and that future decommissioning activities protect public health, environmental quality, and community wellbeing.

PART A: HAZARDOUS AND MEDICAL WASTE MANAGEMENT PLAN (HMWMP)

8.2 Objectives

The HMWMP aims to:

- Protect healthcare workers, patients, waste handlers, and communities from hazardous and medical waste risks.
- Prevent environmental contamination of soil, groundwater, surface water, and air.

- Ensure compliance with AfDB ISS, FMEnv, NESREA, LASEPA, LAWMA, WHO, IFC, and ILO standards.
- Establish a practical, enforceable waste management system for segregation, collection, storage, treatment, transport, and disposal.
- Minimise waste generation through reduction, reuse (where safe), and improved inventory management.
- Build capacity through training for all personnel involved in waste handling.
- Establish monitoring and reporting procedures for continuous improvement.
- Provide emergency response procedures for spills, needle-stick injuries, and hazardous waste incidents.

8.3 Regulatory and Policy Framework

8.3.1 Nigerian Regulations

Nigeria has a comprehensive regulatory framework governing hazardous and medical waste management. The HMWMP aligns with all applicable federal and state laws.

Table 8.1: Nigerian Regulations Relevant to HMWMP

Regulation	Key Requirements	Relevance to HMWMP
FMEnv National Environmental (Sanitation and Wastes Control) Regulations, 2009	Requires proper segregation, storage, collection, treatment, and disposal of all waste streams; prohibits open burning	Core framework for medical waste segregation, storage, and disposal
Harmful Waste Act CAP H1 LFN 2004	Prohibits import, transport, dumping, or disposal of harmful waste; imposes criminal penalties	Governs asbestos, chemical waste, pharmaceutical waste
NESREA Hazardous Waste Regulations (2009)	Classification, labeling, manifesting, transport, and disposal of hazardous waste	Applies to chemical waste, asbestos, expired batteries
LASEPA Waste Management Law (2017)	State-level permits for waste handling; environmental compliance inspections	Required for PHC waste storage and disposal

LAWMA Healthcare Waste Guidelines (2019)	Colour coding, packaging, collection schedules, disposal at designated facilities	Governs operational medical waste management

8.3.2 International Standards

International standards provide technical guidance and best practice benchmarks for safe waste management.

Table 8.2: International Standards Relevant to HMWMP

Standard	Key Requirements	Relevance to HMWMP
AfDB ISS – OS4 (Pollution Prevention and Hazardous Materials)	Requires hazardous materials management plan; pollution prevention hierarchy	Core safeguard framework
IFC EHS Guidelines for Healthcare Facilities (2012)	Segregation, sharps management, wastewater treatment, autoclave standards	Technical specifications for PHC operations
WHO Safe Management of Wastes from Health Care Activities (2014)	Waste classification, colour coding, segregation, storage, transport, treatment	Adopted in full for HMWMP
ILO Convention 155 & 161	Worker protection, medical surveillance, OHS systems	Applies to waste handlers, asbestos workers

8.4 Healthcare Waste Categories (AfDB Classification)

AfDB ISS Operational Safeguard 4 (OS4: Pollution Prevention and Hazardous Materials) requires borrowers to classify and manage waste in line with international good practice, adopting the WHO healthcare waste classification and colour coding system, the IFC EHS Guidelines for Healthcare Facilities (2012), and applicable national regulations (FMEnv, NESREA, LASEPA, LAWMA). The table below presents the AfDB OS4-aligned waste categories adapted to the specific waste streams anticipated at the three Ibeju-Lekki Axis PHC facilities during refurbishment and operation.

Table 8.3: AfDB (OS4-Aligned) Waste Categories, Colour Codes, and Disposal Methods for the Ibeju-Lekki Axis PHCs

Table 8.3: AfDB (OS4-Aligned) Waste Categories

Category	Description	Examples (Ibeju-Lekki Axis)	Colour Code	Treatment / Disposal
General Waste	Non-hazardous, non-infectious domestic-type waste	Paper, packaging, food waste from all three PHCs	Black	LAWMA collection → approved sanitary landfill
Infectious Waste	Waste contaminated with blood or body fluids	Dressings, swabs, gloves from maternal/child health and outpatient services at Magbon, Idaso, Idotun	Yellow	On-site autoclave (121°C, 30 min) → LAWMA landfill
Sharps	Items capable of puncturing skin	Needles, scalpels, lancets from immunisation and clinical care	Red (puncture-proof safety box)	Incineration at licensed facility
Pathological Waste	Human tissues, placentae, body fluids	Placentae from delivery services at the three PHCs	Yellow (marked "Pathological")	Incineration or deep burial per WHO/LAWMA guidelines
Pharmaceutical Waste	Expired, unused, or contaminated medicines	Expired tablets, vials, vaccines from PHC pharmacies	Brown	Return to manufacturer or high-temperature

				incineration via licensed contractor
Chemical Waste	Hazardous laboratory and cleaning chemicals	Formalin, xylene, laboratory reagents, chlorine solutions	Blue	Licensed hazardous waste contractor → licensed hazardous waste facility
E-Waste & Batteries	Waste electrical equipment and storage batteries	Solar PV batteries, inverters, and medical electronics at all three sites	Special label ("E-Waste / Battery")	Licensed e-waste recycler; batteries as hazardous waste (NESREA-compliant)
Construction & Demolition Hazardous Waste	Fuels, oils, paints, solvents from refurbishment works	Waste oil, fuel-contaminated soil, paint residues; heightened risk near creeks at Magbon and wetlands at Idaso	Special label (per NESREA classification)	Bunded storage on site → licensed hazardous waste contractor; spill reporting to LASEPA/NOSDRA
Asbestos-Containing Material (ACM)	Suspected chrysotile in old roofing and wall materials	Magbon and Idaso (subject to licensed survey confirmation)	Special label ("DANGER – ASBESTOS"); double-bagged	Licensed abatement (wet removal); manifested transport → hazardous waste landfill

8.5 Waste Management System Overview

Under the AfDB ISS Operational Safeguard 4 (Pollution Prevention and Hazardous Materials), waste must be managed according to the following hierarchy, applied in strict order of preference:

- Avoid / Prevent: Eliminate waste generation at source wherever possible (e.g., avoiding over-ordering of pharmaceuticals, substituting hazardous chemicals such as mercury thermometers with digital alternatives).
- Minimise / Reduce: Where generation cannot be avoided, reduce the quantity and hazardousness of waste produced (e.g., bulk purchasing to cut packaging, inventory management to keep expired drugs below 1%).
- Reuse: Safely reuse materials where feasible and hygienically acceptable (e.g., sterilising reusable clinical instruments, autoclavable sharps containers).
- Recycle / Recover: Recover materials or energy from waste streams (e.g., recycling demolition metal and concrete, recycling solar PV panels and e-waste through licensed recyclers).
- Treat: Render residual waste less hazardous before disposal (e.g., autoclaving infectious waste at 121°C for 30 minutes, chemical disinfection of liquid waste).
- Dispose: Safe, compliant disposal only as the last resort (e.g., LAWMA sanitary landfill for treated general and infectious waste; licensed hazardous waste landfill for asbestos and chemical waste, with full manifests).

The HMWMP follows the AfDB waste management hierarchy:

- Avoid / Prevent
- Minimise / Reduce
- Reuse
- Recycle / Recover
- Treat
- Dispose



Figure 8.1: Flowchart of Waste Management

8.6 Waste Minimisation

Table 8.4: Waste Minimisation Strategies

Strategy	Action	Responsible	Target
Reduce packaging	Bulk ordering	Facility Manager	10% reduction
Avoid over-ordering	Inventory system	Pharmacy	<1% expired
Safe reuse	Sterilise reusable items	Clinical Staff	N/A
Replace hazardous chemicals	Use digital thermometers	Laboratory	Mercury eliminated
Reusable sharps containers	Autoclavable containers	Clinical Staff	Reduced plastic waste
Segregation at source	Correct bin use	All staff	100% compliance

8.7 Waste Segregation at Source

The AfDB ISS Operational Safeguard 4 requires borrowers to adopt internationally recognized good practice, in this case the WHO colour coding system for healthcare waste, together with applicable national requirements (LAWMA Healthcare Waste Guidelines 2019, NESREA hazardous waste labelling). The system below is therefore the WHO colour coding applicable to the Ibeju-Lekki Axis PHCs:

8.7.1 WHO Colour Coding System

Table 8.5: WHO Colour Coding System

Colour	Category	Container Type	Label / Marking	Examples (Ibereko, Gberefu, Agboyi)
Black	General waste	Plastic bin with black liner	"General Waste"	Paper, packaging, food waste
Yellow	Infectious waste	Leak-proof bin with yellow liner	Biohazard symbol	Dressings, swabs, gloves
Yellow (marked)	Pathological waste	Leak-proof, sealed container	Biohazard symbol + "Pathological"	Placentae, body fluids from delivery services
Red	Sharps	Puncture-proof safety box	"Sharps"	Needles, scalpels, lancets
Brown	Pharmaceutical waste	Rigid, sealable container	"Pharmaceutical Waste"	Expired tablets, vials, vaccines
Blue	Chemical waste	Chemical-resistant container	"Chemical Waste"	Formalin, xylene, lab reagents
Special label	E-waste / batteries	Sealed, segregated storage	"E-Waste / Battery"	Solar-hybrid system batteries, inverters
Special label	Asbestos (ACM)	Double-bagged, 1000-gauge polythene	"DANGER – ASBESTOS"	Ibereko, Gberefu only

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8.7.2 Segregation Procedures

- Place colour-coded bins at all waste generation points
- Line bins with matching colour bags
- Segregate waste at point of generation
- Do not overfill bins (max 3/4 full)
- Seal bags when full
- Label bags with facility name, date, category
- Transport sealed bags to storage area, pending Barge-to-Truck transfer at Gberefu and Agboyi

8.7.3 Segregation Monitoring

Indicator	Target	Method	Frequency	Responsible
Segregation compliance	≥95%	Spot checks	Daily	Supervisor
Infectious waste in black bags	<1%	Inspection	Daily	Waste Handler
Sharps in plastic bags	Zero	Inspection	Daily	Waste Handler
Training compliance	100%	Records	Quarterly	Facility Manager

8.8 Collection, Internal Transport, and Storage

8.8.1 Collection Procedures

- Waste handler collects sealed bags daily using PPE
- Uses dedicated trolley (Ibereko) or secure carrier suitable for waterborne transfer (Gberefu, Agboyi)
- Replaces bin liners; cleans bins with 0.5% chlorine
- Records collection in waste log
- At Gberefu and Agboyi, sealed and manifested loads are transferred by covered barge/canoe to the designated mainland transfer point, where custody passes to a licensed truck under the Barge-to-Truck system (Section 8.5 of the HMWMP)

8.8.2 Storage Requirements

- Lockable, ventilated storage area with impermeable floor at all three facilities
- Signage: “Hazardous Waste Storage – Authorised Personnel Only”
- Maximum storage time: 48 hours for infectious waste at Gberefu and Agboyi this window must account for barge-transfer scheduling, and storage capacity should be sized to accommodate any delay in waterborne collection due to weather or tidal conditions

8.9 Waste Treatment Technologies

8.9.1 Autoclaving

121 C, 30 minutes, 15 psi; monthly biological indicator testing; weekly cleaning – applied on-site at all three facilities before any waterborne transfer from Gberefu and Agboyi, reducing the infectious hazard of loads before they leave the site.

8.9.2 Chemical Disinfection

0.5-1% chlorine; 30-minute contact time; suitable for small volumes of liquid waste.

8.9.3 Recommended Treatment by Facility Type

Facility Type	Waste Volume	Treatment
Refurbished PHCs (Ibereko, Gberefu, Agboyi)	40-200 kg/day	Autoclave + shredder

8.10 Asbestos Management Plan

8.10.1 Asbestos-Affected Sites

Site	Status	Type	Location	Estimated Quantity
Ibereko	Suspected	Chrysotile	Roof and wall materials	To be confirmed by licensed survey
Gberefu	Suspected	Chrysotile	Roof and wall materials	To be confirmed by licensed survey
Agboyi	Not flagged	–	–	–

8.10.2 Asbestos Survey

- Engage licensed surveyor
- Conduct sampling and lab analysis at Ibereko and Gberefu
- Produce survey report
- Prepare abatement plan
- Submit to LASEPA
- Obtain approval

8.10.3 Asbestos Abatement Procedures

Notify community (48 hours); establish containment zone; negative pressure enclosure; PPE (Type 5 coverall, P3 respirator); wet removal; double bagging; label “DANGER – ASBESTOS”; air monitoring (≤0.1 f/ml); hazardous waste landfill; clearance monitoring (≤ 0.01 f/ml); medical

surveillance. At Gberefu, abated asbestos waste must additionally follow the Barge-to-Truck manifested transfer procedure to the mainland disposal chain.

8.10.4 Asbestos Waste Manifest

Generator; transporter (including, for Gberefu, the barge operator as an intermediate custody holder); disposal facility; waste description; quantity; manifest number; signatures.

8.11 Occupational Health and Safety for Waste Handlers

8.11.1 Risks

Hazard	Risk
Sharps	HIV, HBV, HCV
Infectious waste	Bacterial/viral infections
Chemicals	Burns, poisoning
Asbestos	Lung cancer (Ibereko, Gberefu)
Manual handling	Back injury
Waterborne transfer	Drowning; waterborne disease exposure (Gberefu, Agboyi)

8.11.2 PPE Requirements

Task	PPE
Collecting waste	Gloves, apron, boots, mask
Infectious waste	Gloves, apron, boots, goggles
Sharps	Puncture-proof gloves
Chemical waste	Chemical-resistant gloves, goggles
Asbestos	Type 5 coverall, P3 respirator
Barge/canoe waste transfer	Life jacket; secure load-strapping; standard PPE beneath

8.11.3 Health Surveillance

Hepatitis B vaccination; tetanus booster; pre-placement exam; annual medical exam; needle-stick protocol; asbestos medical surveillance (Ibereko, Gberefu waste handlers).

8.11.4 Training Requirements

HMWMP; PPE use; needle-stick prevention; spill response; asbestos awareness (Ibereko, Gberefu); hand hygiene; waterborne-transfer safety (Gberefu, Agboyi).

8.12 Spill Response Plan

8.12.1 Spill Scenarios

Type	Source	Response
Small chemical	Lab reagent	Absorb; hazardous bag
Large chemical	Bulk container	Evacuate; contain
Infectious	Blood/body fluids	PPE; chlorine; yellow bag
Fuel/oil	Construction / barge operation	Spill kit; report to NOSDRA
Waterborne loss overboard	Barge/canoe transfer	Immediate retrieval where safe; report to LASEPA/NOSDRA; do not attempt retrieval in unsafe conditions

8.12.2 Spill Kit Contents

Absorbents, booms, chlorine, PPE, disposal bags, instructions – with a dedicated waterproof spill kit maintained on each barge/canoe servicing Gberefu and Agboyi.

8.12.3 Spill Reporting

- >1 litre: immediate report
- Water body (Badagry Lagoon at Gberefu; Ogun/Maidan River at Agboyi): LASEPA/NOSDRA within 24 hours
- Needle stick: immediate
- Asbestos release: PIU/LASEPA/NESREA immediately

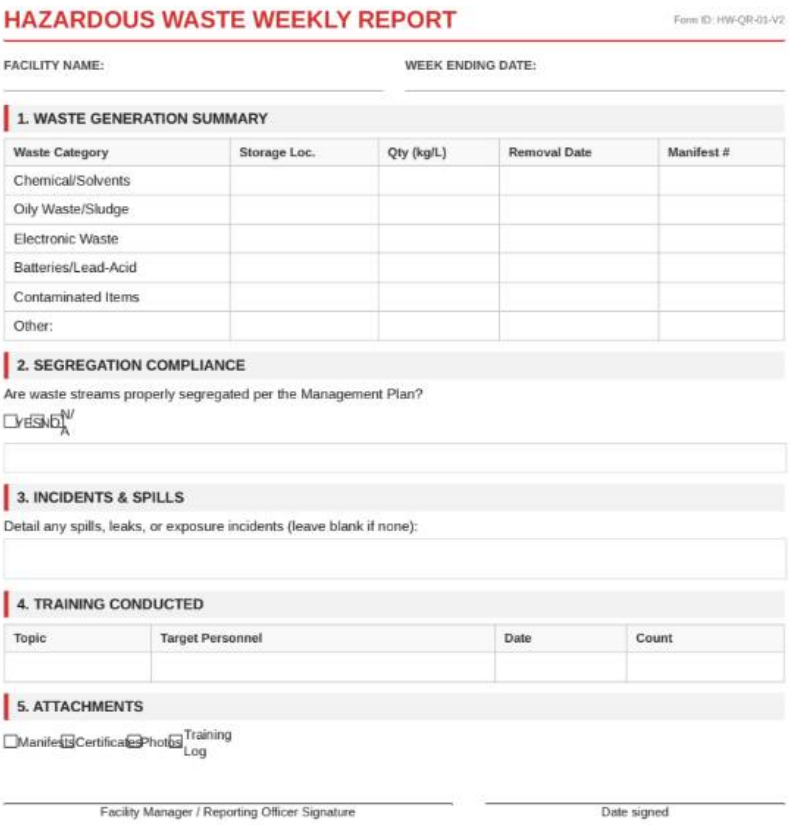
8.13 Monitoring and Reporting

8.13.1 Monitoring Indicators

Waste generation; segregation compliance; autoclave parameters; manifests (including barge-to-truck chain-of-custody completeness); LAWMA collection; asbestos monitoring (Ibereko, Gberefu); needle-stick incidents; training compliance.

8.13.2 Reporting Templates

Daily waste log; autoclave log; hazardous waste manifest; barge-transfer log (load, time, receiving truck operator signature).



HAZARDOUS WASTE WEEKLY REPORT

Form ID: HW-QR-01-V2

FACILITY NAME: WEEK ENDING DATE:

1. WASTE GENERATION SUMMARY

Waste Category	Storage Loc.	Qty (kg/L)	Removal Date	Manifest #
Chemical/Solvents				
Oily Waste/Sludge				
Electronic Waste				
Batteries/Lead-Acid				
Contaminated Items				
Other:				

2. SEGREGATION COMPLIANCE

Are waste streams properly segregated per the Management Plan?

☐ YES ☐ NO ☐ N/A

3. INCIDENTS & SPILLS

Detail any spills, leaks, or exposure incidents (leave blank if none):

4. TRAINING CONDUCTED

Topic	Target Personnel	Date	Count

5. ATTACHMENTS

☐ Manifests ☐ Certificates ☐ Photos ☐ Training Log

Facility Manager / Reporting Officer Signature

Date signed

Figure 8.2 – Hazardous waste reporting form (weekly)

8.14 Roles and Responsibilities

Entity	Role Summary	Detailed Responsibilities
Facility Manager	Overall HMWMP implementation	Ensure compliance with colour coding and segregation; maintain logs and manifests; supervise waste handlers; coordinate LAWMA collections and the Barge-to-Truck transfer schedule; investigate incidents; report quarterly to PIU

Clinical Staff	Waste segregation at point of generation	Correct bin use; avoid overfilling; sharps only in red containers; report errors; participate in training
Waste Handler	Daily collection, transport, treatment	Collect sealed bags using PPE; operate autoclave; conduct/support barge-based transfer at Gberefu and Agboyi with life jacket and load-securing procedures; maintain manifests; report incidents
Facility Supervisor	Monitoring & compliance enforcement	Daily segregation spot checks; storage inspection; autoclave maintenance; report to Facility Manager
LAWMA	Medical waste collection & disposal	Collect treated waste at the mainland transfer point (Gberefu/Agboyi) or directly (Ibereko); provide manifests; dispose at approved landfill; periodic inspections
Licensed Hazardous Waste Contractor	Hazardous waste transport & disposal	Collect chemical, pharmaceutical, and asbestos waste; provide manifests; licensed transport and disposal; disposal certificates
PIU (Lagos State Ministry of Health)	Oversight & regulatory compliance	Ensure all PHCs implement the HMWMP and Decommissioning Plan; coordinate with LAWMA, LASEPA, NESREA; manage GRM for waste-related incidents; report quarterly to AfDB; ensure asbestos surveys and abatement plans are completed for Ibereko and Gberefu; oversee the Barge-to-Truck agreement
LASEPA	State regulatory oversight	Issue waste permits; approve asbestos abatement plans; compliance inspections
AfDB	Safeguard compliance monitoring	Review HMWMP and Decommissioning Plan; monitor compliance through PIU/IESM reports

8.15 Budget Estimate

This section provides a cost estimate for implementing the HMWMP and Decommissioning Plan across the three PHC facilities in the Badagry Axis (Group 8). Costs are based on Nigerian market rates, WHO/IFC technical requirements, and FMEnv regulatory expectations, and are presented separately from the axis's broader ESMP budget (Chapter 7, Section 7.10), consistent with how the two budget lines are treated in the LSHIP ESIA template.

A. Capital Costs (One-Time Investments)

Item	Description	Estimated Cost (USD)	Responsible
Autoclave (per PHC)	121 C, 30 min, 15 psi; stainless steel chamber	$40,000-$80,000	Facility Operator
Shredder (per PHC)	Post-autoclave waste volume reduction	$16,000-$40,000	Facility Operator
Waste Storage Area Construction	Ventilated, lockable, impermeable flooring (sized for extended storage at Gberefu/Agboyi pending barge transfer)	$16,000-$40,000	Facility Operator
Barge-to-Truck Transfer Point Setup	Mainland transfer point, secure loading facilities, chain-of-custody equipment (Gberefu, Agboyi)	$10,000-$25,000	PIU / Facility Operator
Spill Kits (per facility, plus waterproof barge kits)	Chemical, infectious, fuel spill kits	$800-$2,000	Facility Operator
PPE for Waste Handlers (annual, incl. life jackets)	Gloves, boots, aprons, goggles, masks, life jackets	$4,000-$9,000	Facility Operator
Asbestos Abatement (Ibereko, Gberefu only)	Survey, wet removal, air monitoring, disposal	$10,000-$50,000 per site	PIU / Contractor

B. Operational Costs (Annual)

Item	Description	Estimated Cost (USD)	Responsible
LAWMA Collection Fees	Twice-weekly infectious waste collection (via Barge-to-Truck for Gberefu/Agboyi)	$14,000-$32,000	Facility Operator
Hazardous Waste Contractor (Chemicals)	Annual chemical waste disposal	$2,000-$8,000	Facility Operator
Autoclave Maintenance	Spare parts, servicing	$3,000-$6,000	Facility Operator
Biological Indicator Strips	Monthly autoclave validation	$500	Facility Operator
Training (annual)	Waste handlers, clinical staff, waterborne-transfer safety	$3,500-$7,000	Facility Operator
Solar-Hybrid Battery Disposal	Hazardous waste disposal	$1,000-$3,000	Facility Operator
Barge/Canoe Charter & Maintenance	Waste-transfer vessel operation (Gberefu, Agboyi)	$4,000-$10,000	Facility Operator

C. Decommissioning Costs (End of Life)

Item	Description	Estimated Cost (USD)	Responsible
Demolition Works	Manual/mechanical demolition	$20,000-$60,000	Contractor
Asbestos Removal (if present)	Full abatement & hazardous landfill (Ibereko, Gberefu)	$10,000-$50,000	Specialist Contractor
Site Restoration	Regrading, revegetation, erosion control	$10,000-$40,000	Contractor
Mangrove Margin Restoration	Native mangrove replanting, invasive species removal (Gberefu, Agboyi)	$8,000-$25,000	Contractor

Borehole & Septic Tank Decommissioning	Sealing, sludge disposal	$5,000-$15,000	Contractor
Community Infrastructure Restoration	Road repair (Ibereko), barge landing point restoration (Gberefu, Agboyi), debris removal	$6,000-$22,000	Contractor

Total Estimated Cost (All 3 PHCs)

- Year 1 (Capital + Operational): $95,000-$230,000
- Annual Operational Cost: $32,000-$66,000
- Decommissioning Cost per PHC: $50,000-$160,000 (higher at Gberefu/Agboyi given mangrove-restoration scope)

PART B: DECOMMISSIONING AND RESTORATION PLAN

8.16 Introduction

Although the PHC facilities in the Badagry Axis are expected to operate for 50 years or more, the Federal Ministry of Environment (FMEnv) requires all ESIA reports to include a Decommissioning and Restoration Plan. This ensures that, when each facility reaches the end of its operational life, demolition and site restoration are carried out safely, responsibly, and in compliance with national and international standards – with particular attention, for this axis, to the mangrove and cultural-heritage assets at Gberefu and Agboyi.

8.17 Objectives

The Decommissioning and Restoration Plan aims to:

- Ensure safe removal, handling, and disposal of hazardous materials (asbestos at Ibereko/Gberefu; batteries; chemicals).
- Minimise environmental impacts (dust, noise, erosion, water pollution) during demolition.
- Protect worker and community health and safety, including waterborne-transit safety during decommissioning works at Gberefu and Agboyi.
- Restore each site to a stable, safe, and environmentally acceptable condition.
- Rehabilitate ecological features – specifically the mangrove margins at Gberefu and Agboyi.
- Maintain community access and infrastructure, including barge landing points.
- Ensure compliance with FMEnv, NESREA, LASEPA, AfDB ISS, and WHO standards.

- Provide clear roles, responsibilities, and monitoring requirements, with particular vigilance to protect the "Point of No Return" and Spirit Attenuation Well at Gberefu throughout decommissioning.

8.18 Decommissioning Strategy and Activities

8.18.1 Physical Infrastructure

Activity	Description	Environmental & Social Considerations
Equipment Salvage	Remove medical equipment, solar-hybrid panels, batteries, furniture	Hazardous waste (batteries); safe handling; recycling
Building Demolition	Manual or mechanical demolition	Dust suppression; noise control; asbestos removal (Ibereko, Gberefu); OHS
Demolition Waste Management	Segregate demolition waste (metal, concrete, wood)	Recycling; hazardous waste manifests; Barge-to-Truck transfer for Gberefu/Agboyi
Site Restoration	Regrade land, replant native species, stabilise slopes	Soil erosion control; biodiversity restoration

8.18.2 Utilities and Ancillary Infrastructure

Activity	Description	Environmental & Social Considerations
Septic Tank Decommissioning	Pump out sludge, remove tank, backfill	Sludge as hazardous waste; groundwater protection – particular care given the axis's existing E. coli contamination baseline at Agboyi/Gberefu
Borehole Decommissioning	Seal borehole with grout	Prevent groundwater contamination
Solar-Hybrid System Removal	Remove panels, inverters, batteries	Hazardous waste (batteries); panel recycling

Barge Landing Point Decommissioning	Remove mooring structures, restore riverbank/shoreline profile (Gberefu, Agboyi)	Ensure no debris remains in Badagry Lagoon or the Ogun/Maidan River

8.19 Environmental Restoration Measures

8.19.1 Mangrove Margins and Riparian Corridors

Site	Restoration Measure
Gberefu (barrier island, mangrove/Critical Habitat, storm-surge exposure)	Restore shoreline; replant native mangroves (*Rhizophora racemosa*); remove invasive species; protect the "Point of No Return" site and the Spirit Attenuation Well from any restoration-related ground disturbance
Agboyi (riparian/mangrove Critical Habitat, Ogun/Maidan River, extreme fluvial dynamics)	Restore hydrology and riparian margin; replant native species; remove invasive species; verify flood-buffering function given the site's fluvial flood exposure (to 5 m at peak)
Ibereko (coastal, rising-damp structural site)	Restore drainage lines; stabilise any erosion-prone slopes; revegetate disturbed coastal soils

8.19.2 Soils and Erosion Control

Regrade disturbed areas to original contours; apply stored topsoil and revegetate; install silt fences and check dams until vegetation reaches ≥80% cover.

8.19.3 Air Quality and Noise Management

Water spraying during demolition; restrict demolition hours to 7:00-18:00; notify community at least 7 days in advance, coordinated via barge/canoe-delivered notice at Gberefu and Agboyi given the lack of road access.

8.20 Socio-Economic and Cultural Restoration

8.20.1 Livelihood Transition and Support

Provide 3-month advance notice to community; offer skills training and job placement assistance; donate usable equipment to nearby health facilities.

8.20.2 Community Infrastructure and Access

Restore access roads (Ibereko, including feeder routes off the Lagos-Badagry Expressway); restore barge landing points and approach paths (Gberefu, Agboyi); remove all demolition debris; ensure proper drainage.

8.20.3 Cultural Heritage Protection

Apply the Chance Finds Procedure during demolition, with heightened vigilance near the "Point of No Return" site and the Spirit Attenuation Well at Gberefu; stop work immediately if artefacts or heritage features are disturbed; notify the relevant heritage authority and traditional leadership (Obas, Baales) and allow archaeological/cultural assessment before resuming works.

8.21 Monitoring and Reporting

Table 8.6: Decommissioning Monitoring Requirements

Parameter	Indicator	Frequency	Responsible
Asbestos Removal (Ibereko, Gberefu)	Waste manifests; air monitoring	Per load; continuous	Licensed contractor
Site / Mangrove Restoration	Vegetation survival ≥80%	3, 6, 12 months	Contractor / PIU
Erosion Control	Silt fence condition	Weekly	Contractor
Groundwater Quality	pH, TDS, coliforms, heavy metals (priority given existing E. coli baseline)	Quarterly (1 year)	Contractor / PIU
Cultural Heritage Site Condition (Gberefu)	Visual inspection; traditional-authority sign-off	Per decommissioning phase	Contractor / CLO
Community Satisfaction	≥80% satisfied	Post-decommissioning	PIU / IESM

8.22 Institutional Responsibilities

Entity	Responsibilities
PIU	Oversight; compliance; reporting; community liaison across both Badagry and Kosofe LGAs
Contractor	Safe demolition; asbestos abatement (Ibereko, Gberefu); waste management; mangrove and site restoration
Licensed Asbestos Contractor	Survey; abatement; air monitoring; disposal (Ibereko, Gberefu)
Facility Operator	Handover; equipment salvage; record retention

LASEPA / FMEnv	Permits; inspections; compliance enforcement
AfDB	Review and approval; monitoring through PIU reports

8.23 Financial Assurance

LSMoH will establish a Decommissioning Fund or Environmental Bond for the axis, reviewed every 5 years and adjusted for inflation, sized according to asbestos survey outcomes and site/creek-margin restoration scope at each of the three facilities.

8.24 Conclusion

The Decommissioning and Restoration Plan provides a complete, FMEnv-compliant framework for safely dismantling the Gberefu, Ibereko and Agboyi PHCs at end of life, ensuring safe hazardous-materials removal, environmentally sound demolition, restoration of Badagry Creek margins and community assets, and long-term environmental sustainability for the Badagry Axis.

CHAPTER 9 – STAKEHOLDER ENGAGEMENT PLAN (SEP) & GBV/SEA/SH ACTION PLAN

Commented [SA83]: Detail budget in USD inclusive of GRM

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9.1 Introduction

Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH) are recognised as significant risks in infrastructure projects, particularly those involving construction activities, labour influx, and interactions between workers and host communities. The African Development Bank (AfDB) requires all Category 1 projects to implement a GBV/SEA/SH Action Plan to prevent, mitigate, and respond to these risks.

This chapter presents the GBV/SEA/SH Action Plan for the 3 PHC facilities in Group 8 (Badagry Axis), covering all project phases (pre-construction, construction, operation, and decommissioning).

9.1.1 Definition of Terms

Term	Definition
Gender-Based Violence (GBV)	Harmful acts directed at an individual based on their gender. Includes physical, sexual, psychological, and economic violence. Examples: intimate partner violence, rape, sexual assault, child marriage, trafficking, economic coercion.
Sexual Exploitation and Abuse (SEA)	Sexual exploitation: Any actual or attempted abuse of a position of vulnerability, differential power, or trust for sexual purposes, including profiting monetarily, socially, or politically from the sexual exploitation of another. Sexual abuse: Actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.
Sexual Harassment (SH)	Unwelcome sexual advances, requests for sexual favours, and other verbal or physical conduct of a sexual nature that interferes with work, creates an intimidating or hostile environment, or affects employment decisions (e.g., quid pro quo).
Survivor-centered approach	An approach that prioritises the rights, needs, and wishes of the survivor. Ensures confidentiality, safety, respect, non-discrimination,

	and no retaliation. Empowers the survivor to make informed decisions about their own care and reporting.
Code of Conduct (CoC)	A binding set of rules prohibiting GBV/SEA/SH, signed by all workers, subcontractors, and security personnel. Includes sanctions for violations (warning, suspension, termination, legal prosecution).
Referral pathway	A coordinated system of service providers (medical, psychosocial, legal, shelter) that survivors can be referred to for support. Includes pre-negotiated memoranda of understanding (MOUs) and contact lists.

9.1.2 Objectives of the GBV/SEA/SH Action Plan

The GBV/SEA/SH Action Plan aims to:

5. **Prevent GBV/SEA/SH** by identifying and mitigating risk factors (labour influx, poor lighting, isolated paths, lack of female staff, lack of confidential reporting, economic vulnerability).
6. **Protect survivors** through a survivor-centered approach (confidentiality, safety, respect, non-discrimination, no retaliation) and provide access to quality medical, psychosocial, legal, and shelter services.
7. **Promote accountability** by enforcing a Code of Conduct (CoC) for all workers, subcontractors, and security personnel, with clear sanctions for violations (warning, suspension, termination, legal prosecution).
8. **Build capacity** of PIU staff, contractors, facility operators, and community members to prevent, recognise, and respond to GBV/SEA/SH.
9. **Establish confidential, accessible reporting mechanisms** (hotline, suggestion boxes, female GRM focal points, anonymous options) for workers and community members.
10. **Coordinate with existing service providers** (medical, psychosocial, legal, shelter) and establish referral pathways for survivors.
11. **Monitor and evaluate** the effectiveness of GBV prevention and response measures through indicators (training completion, incidents reported, response time, survivor satisfaction).
12. **Ensure compliance** with AfDB ISS (OS5), Nigerian law (VAPP Act 2015, Labour Act), and international standards (WHO/ILO Joint Guidance on Health Worker Safety, IFC Good Practice Note on GBV/SEA/SH).

9.2 Legal and Policy Framework

9.2.1 Nigerian Legal Framework

Table 9.1: Nigerian Legal Framework

Law	Key Provisions	Relevance to GBV/SEA/SH Action Plan
Violence Against Persons (Prohibition) (VAPP) Act 2015 (Federal Government of Nigeria, 2015)	Prohibits rape, sexual assault, female genital mutilation, domestic violence, harmful widowhood practices, and other forms of violence. Provides for survivor support (medical, psychosocial, legal), protection orders, and penalties (up to life imprisonment for rape).	Core legal framework for GBV prevention and response. Referral pathways must align with VAPP Act provisions.
Labour Act Cap L1 LFN 2004 (Federal Government of Nigeria, 2004)	Prohibits forced labour, child labour, and discrimination. Regulates working conditions, hours, wages, and safety.	Worker protections; Code of Conduct must align with Labour Act.
Child Rights Act 2003 (Federal Government of Nigeria, 2003)	Prohibits child marriage, child labour, sexual abuse of children. Provides for child protection.	Prohibition of sexual activity with minors (anyone under 18) – zero tolerance.
Criminal Code Act Cap C38 LFN 2004 (Federal Government of Nigeria, 2004)	Defines sexual offences (rape, indecent assault, unnatural offences). Provides for penalties.	Legal prosecution of perpetrators.
National Gender Policy (2006, revised) (Federal Ministry of Women Affairs, 2006)	Promotes gender equality, women's empowerment, and elimination of GBV. Establishes institutional mechanisms (Ministry of Women Affairs, GBV response units).	Alignment with national policy; coordination with Ministry of Women Affairs.

Lagos State Domestic Violence Law (2007) (Lagos State Government, 2007)	Provides for protection of survivors of domestic violence, protection orders, and establishment of Domestic Violence Advisory Committee.	State-level legal framework for GBV response in Lagos.

9.2.2 AfDB and International Framework

Table 9.2: AfDB and International Framework

Standard	Key Requirements	Relevance to GBV/SEA/SH Action Plan
labour/OHS OS2 (Labour and Working Conditions);	Requires assessment of GBV/SEA/SH risks; development of GBV Action Plan; Code of Conduct; training; confidential reporting; referral pathways; survivor-centered response.	Core framework for this Action Plan.
IFC Good Practice Note on GBV/SEA/SH (2020) (International Finance Corporation, 2020)	Provides guidance on risk assessment, mitigation hierarchy, Code of Conduct, community engagement, grievance mechanisms, survivor assistance, monitoring.	Technical guidance for implementation.
ILO Convention 190 – Violence and Harassment in the Workplace (2019) (International Labour Organization, 2019)	Defines violence and harassment in the workplace; requires prevention, protection, enforcement, and remedy.	Worker protection; Code of Conduct; grievance mechanism.
ILO Convention 155 – Occupational Safety and Health (International Labour Organization, 1981)	Requires safe working environment, free from violence and harassment.	Worker protection.

WHO/ILO Joint Guidance on Health Worker Safety (World Health Organization, 2020)	Addresses violence against health workers, including sexual violence.	Protection of health workers (operational phase).
UN Guiding Principles on Business and Human Rights (UNGPs) (United Nations, 2011)	Corporate responsibility to respect human rights; access to remedy.	GRM as remedy for GBV survivors.
WHO Clinical Management of Rape and Intimate Partner Violence Guidelines (World Health Organization, 2013)	Provides medical protocols for post-rape care (PEP for HIV, emergency contraception, STI treatment, psychosocial support).	Referral pathway – medical services.

9.3 GBV/SEA/SH Risk Assessment (Group 8 Axis)

9.3.1 Project-Specific Risk Factors

The project-specific GBV/SEA/SH risk factors for the Group 8 Axis (covering Ibereko, Gberefu, and Agboyi) are tailored to reflect their specific settlement morphologies, isolation levels, and operational footprints:

Risk Factor	Description	Group 8 Axis Sites	Risk Level (Unmitigated)
Labour influx	120–240 workers during construction (peak). Workforce is male-dominated. Influx into remote or historical island and wetland communities creates a high power imbalance.	All 3 sites (Highest at Ibereko and Gberefu due to transport/tourist transit scale)	Medium to High
Poor lighting	Inadequate street and pathway lighting in coastal, island, and riverine communities. Lack of illumination at boat landing	Gberefu, Agboyi, Ibereko (Remote riverine/coastal/water-locked approaches)	High

	points and jetty areas increases vulnerability after dark.		
Isolated paths	Unlit, unpatrolled footpaths, island tracks, and riverine boardwalks through mangroves and swamps between homes, water sources, and the PHCs. Women and girls walking alone are highly vulnerable.	Ibereko, Gberefu, Agboyi	High
Lack of female staff	Historically low representation of female security or senior clinical staff in rural and island settings. Cultural barriers may prevent women from reporting GBV to male officers or staff.	All 3 sites	Medium
Lack of confidential reporting	Absence of dedicated GBV hotlines or safe spaces in the riverine and island reaches. Survivors in Gberefu or Agboyi fear community stigma and lack discreet, water-safe transport to help.	All 3 sites	High (Targeted by GBV Action Plan)
Economic vulnerability	High reliance on artisanal fishing, boat transport, and petty trading. Coastal and wetland poverty makes women susceptible to "Sex-	Gberefu, Agboyi	High

	for-Fish" or "Sex-for-Transit" (exchange for boat rides or goods).		
Substance abuse	Use of local spirits and drugs among some transient workforce or youth populations; exacerbated by lack of recreational outlets in rural work camps.	Ibereko (Larger commercial transit hub)	Medium
Cultural norms	Strong patriarchal structures in rural fishing and farming settlements; intimate partner violence (IPV) often viewed as a private family matter; low awareness of legal protections like the VAPP Act.	All 3 sites (especially rural island/riverine settlements)	Medium
Police response	Limited police presence in remote riverine and island areas; reliance on informal traditional justice; lack of female officers at local outposts for confidential reporting.	Gberefu, Agboyi	High (Targeted by referral pathways)
Displacement and Resettlement	Minor economic stress or temporary access disruptions for informal vendors/traders during construction works. Increased domestic tension due to short-term livelihood changes.	Site-specific transit points	Medium

9.3.2 GBV Risk Rating by Site (Group 8 Axis)

Table 9.3 – GBV Risk Rating by Site (Group 8 Axis)

Site	Labour Influx	Poor Lighting	Isolated Paths	Lack of Female Staff	Lack of Confidential Reporting	Economic Vulnerability	Substance Abuse	Cultural Norms	Police Response	Displacement	Overall Risk
Iberekodo	Medium	High	High	High	High	Low	Medium	Medium	High	None	Medium–High
Gberefu	Medium	High	High	High	High	High	Low	Medium	High	None	Medium–High
Agboyi	Low	High	High	High	High	High	Low	Medium	High	None	High

9.3.3 Specific Risk Scenarios

Scenario	Description	Likelihood (Unmitigated)	Consequence	Risk Level
Worker-to-community SEA	Construction worker at Gberefu or Agboyi offers money, food, or transit assistance (canoe/boat rides) to a community woman or girl in exchange for sex.	Likely (Due to riverine/island poverty and lack of oversight in remote water-locked sites)	Survivor trauma; STI/HIV; unwanted pregnancy; community anger leading to boat blockades, project shutdowns, and reputational damage	Major

Worker-to-worker SH	A supervisor pressures a female worker for sexual favors at the Ibereko site, or male workers create a hostile environment through unwelcome comments or physical contact.	Possible	Survivor leaves job; hostile work environment; reduced female participation in construction; legal action under the VAPP Act	Major
Community GBV (Intimate Partner Violence)	Economic pressure from temporary project-related access disruptions or changes in local market dynamics leads to increased domestic tension and IPV.	Possible	Survivor injury; family breakdown; child trauma; community protest; increased burden on local healthcare facilities	Major
GBV against vulnerable groups	Women with disabilities, elderly women, or girls in isolated island or riverine areas (Gberefu, Agboyi) are targeted due to	Possible	Severe trauma; limited access to support services or Sexual Assault Referral Centres (SARCs); no reporting due to fear or lack of	Major

	limited physical protection and distance from security agencies.		transport to mainland facilities	
Child sexual abuse	A worker engages in sexual activity with a minor (under 18) in the host communities of Ibereko, Gberefu, or Agboyi.	Unlikely (Subject to strict zero tolerance)	Severe child trauma; legal prosecution (life imprisonment under the VAPP Act); project suspension by funders	Critical
Survivor reports but no response	A survivor in Gberefu or Agboyi reports GBV through the GRM, but no action is taken because the GRM focal point is not trained or the water-based referral pathway is broken.	Possible (If boat-based referral protocols are not established)	Survivor re-traumatized; total loss of trust in project authorities; community-wide protest; institutional sanctions	Critical
Community protest over GBV	Unaddressed GBV incidents across Group 8 sites lead to community anger, resulting in site blockades,	Possible (If repeated incidents occur without visible sanctions)	Project shutdown (days to weeks); reputational damage; financial loss; physical injury to staff and workers	Major to Critical

	disruption of water transport, or damage to construction equipment.			

9.4 Prevention Measures

9.4.1 Code of Conduct (CoC)

The Code of Conduct is a binding, written agreement signed by all workers, subcontractors, and security personnel (including supervisors, management, and drivers) before starting work on the LSHIP Badagry Axis facilities.

9.4.1.1 Worker Code of Conduct (Full Text)

Lagos Healthcare Transformative Initiative Project (LSHIP) Code Of Conduct For Workers Badagry Axis Facilities

I, the undersigned, acknowledge that I am working on the LSHIP Badagry Axis facilities, which is financed by the African Development Bank (AfDB) and implemented by the Lagos State Ministry of Health (LSMoH). I understand that GBV/SEA/SH is strictly prohibited, and violations will result in serious consequences, including termination and legal prosecution.

I AGREE TO THE FOLLOWING:

1. Professional Conduct

- I will treat all community members, colleagues, and supervisors with respect and dignity.
- I will follow all safety rules and wear required PPE at all times.
- I will report any safety hazards, incidents, or GBV/SEA/SH concerns to my supervisor or the GRM.

2. Prohibited Behaviours (Zero Tolerance)

- **No sexual harassment** – I will not make unwelcome sexual advances, comments (jokes, whistling, catcalling), gestures, or physical contact.
- **No sexual exploitation or abuse** – I will not exchange money, goods, jobs, or any form of payment or favour for sex.

- **No sexual activity with minors** – I understand that any sexual activity with a person under 18 years of age is prohibited and is a criminal offence (statutory rape) under Nigerian law, regardless of consent.
- **No forced or coerced sexual activity** – I will not use force, threats, intimidation, or coercion to obtain sex.
- **No intimate relationships with community members** (where there is a power imbalance – e.g., supervisor with community woman seeking employment). Consensual relationships in the workplace (between peers) are permitted but must be disclosed to avoid conflict of interest.
- **No fighting, intimidation, violence, or threats of violence** against any person.
- **No alcohol or drug use** on site or during working hours (including lunch breaks). Alcohol or drug use that impairs judgment and leads to GBV is prohibited.
- **No discrimination** based on gender, ethnicity, religion, disability, HIV status, pregnancy, marital status, age, or political opinion.
- **No bullying** – I will not engage in physical, verbal, or psychological bullying.

3. Community Interaction

- I will not enter community members' homes without permission.
- I will not photograph or film community members (especially women and girls) without their explicit consent.
- I will not loiter around schools, markets, or other places where women and girls gather.
- I will respect local customs and traditions (e.g., dress modestly, avoid public displays of affection).

4. Reporting Obligations

- I will report any GBV/SEA/SH incident that I witness or become aware of (by another worker or community member) to the GRM (hotline, suggestion box, female focal point, or my supervisor).
- I understand that failure to report a known incident may result in disciplinary action.

5. Sanctions for Violations

I understand that violations of this Code of Conduct will result in sanctions, up to and including:

- Verbal warning (minor, first-time violation)
- Written warning (repeat minor violation)

- Suspension (serious violation – e.g., sexual harassment)
- Termination (gross violation – e.g., sexual exploitation or abuse, sexual activity with minor)
- Legal prosecution (criminal offences – e.g., rape, sexual activity with minor, assault)

6. Survivor-Centered Response

I understand that any survivor of GBV/SEA/SH has the right to:

- Confidentiality (their name will not be disclosed without consent)
- Safety (no retaliation)
- Respect (no victim-blaming, no judgment)
- Access to medical, psychosocial, legal, and shelter services (referral pathway)
- No requirement to report to police (if they choose not to)

7. Acknowledgment

I have read (or had read to me) and understood this Code of Conduct. I agree to abide by it. I understand that violation may result in termination and legal prosecution.

Field	Information
Full Name (print)	_____
Signature	_____
Date	_____
Position	_____
Employer (Contractor)	_____
Witness (name, signature)	_____

Distribution: Original to worker, copy to Contractor E&S Officer, copy to PIU.

9.4.1.2 Code of Conduct Implementation

Step	Action	Responsible	Timeline
1	Include CoC as mandatory attachment to all worker contracts (and subcontractor agreements)	Contractor	Pre-employment
2	Translate CoC into local languages (Yoruba, Pidgin English) – for workers with limited English literacy	Contractor	Pre-employment

3	Read CoC aloud to workers who cannot read (witness present)	Contractor supervisor	Pre-employment
4	Worker signs CoC (or makes thumbprint if cannot sign)	Worker	Pre-employment
5	Worker receives copy of CoC (in their language)	Contractor	Pre-employment
6	Display CoC (poster) in prominent locations: site entrance, worker accommodation, canteen, notice board	Contractor	Pre-construction
7	Discuss CoC during induction training and monthly toolbox talks	Contractor E&S Officer	Induction + monthly
8	CoC refresher – workers re-sign CoC every 6 months (or after any violation)	Contractor	Every 6 months
9	Contractor submits CoC compliance report (number signed, refreshers) to PIU monthly	Contractor	Monthly

9.4.2 Mandatory Training and Awareness

9.4.2.1 Training for Workers

Training Topic	Duration	Content	Frequency	Responsible	Target Audience
GBV/SEA/SH Awareness (Induction)	1 hour	Definition of GBV, SEA, SH; examples; consequences (survivor impact, project impact, sanctions); Code of Conduct; reporting mechanisms (hotline, female focal points, suggestion boxes);	Before starting work (induction)	Contractor E&S Officer / GBV Specialist	All workers, subcontractors, security personnel

		referral pathways (medical, psychosocial, legal); survivor-centered approach (confidentiality, safety, respect, no retaliation, no victim-blaming)			
GBV/SEA/SH Prevention (Monthly Refresher)	30 minutes	Review of CoC; case studies (scenarios – what would you do?); reminder of reporting mechanisms; Q&A	Monthly (toolbox talk)	Contractor E&S Officer / Site supervisor	All workers
GBV/SEA/SH for Supervisors	2 hours	Responsibilities: enforcing CoC, responding to reports (confidentiality, no retaliation), reporting to PIU, worker welfare, prevention of SH in workplace (power dynamics)	Induction + annual refresher	GBV Specialist / PIU	Supervisors, foremen, managers

GRM Training (for GRM focal points)	1 day	How to receive complaints (active listening, non-judgmental), confidentiality, GBV-sensitive reporting (do not ask leading questions, do not pressure survivor to report to police), referral pathways, documentation (GRM log), escalation	Induction + annual refresher	PIU / GBV Specialist	GRM focal points (including female GRM focal points)

9.4.2.2 Training for Community

Training Topic	**Duration**	**Content**	**Frequency**	**Responsible**	**Target Audience**
GBV Awareness for Community	1 hour	Definition of GBV, SEA, SH; how to recognise GBV; how to report (GRM hotline, female focal points, suggestion boxes) – confidential, no	Quarterly (during construction) + annually (operation)	PIU / GBV Specialist / Community liaison officer	Community members (women, men, youth, traditional leaders, religious leaders, school teachers)

		retaliation; survivor support (do not blame survivor, believe survivor, offer support); referral pathways (medical, psychosocial, legal, shelter)			
Women's Groups Session	2 hours	As above, plus: women's rights (VAPP Act), self-care, safety planning, economic empowerment (livelihood programs), support groups	Quarterly	GBV Specialist / Women's group leader	Women (especially vulnerable – PAPs, traders, farmers, riverine communities)

Youth Session	1 hour	Healthy relationships, consent, respect, reporting, where to get help	Quarterly (during construction)	GBV Specialist / Youth leader	Youth (15-24 years)
Traditional/Religious Leaders Session	2 hours	Role of leaders in preventing GBV (speak out against GBV, support survivors, refer to services, do not mediate GBV cases (especially rape) – refer to police/health services), GRM	Once (pre-construction) + annually	PIU / GBV Specialist	Obas, Baales, CDAs, religious leaders (pastors, imams)

9.4.2.3 Training for Facility Operators (Operational Phase)

Training Topic	**Duration**	**Content**	**Frequency**	**Responsible**	**Target Audience**
GBV/SEA/SH Awareness	1 hour	Recognising signs of GBV (physical injuries,	Induction + annual refresher	GBV Specialist /	Clinical staff (doctors, nurses,

(Healthcare Setting)		psychological distress, repeated visits); how to ask (confidential, non-judgmental: "I notice you have been injured – is someone hurting you?"); medical management (PEP for HIV, emergency contraception, STI treatment); psychosocial support (counselling, referral); legal reporting (with survivor consent); documentation (medical records – confidential)		IPC specialist	midwives, lab technicians, pharmacists)
Referral Pathways (Healthcare Setting)	30 minutes	List of service providers (medical, psychosocial, legal, shelter); how to refer (warm handoff, contact details); coordination with GBV Specialist	Induction + annual refresher	GBV Specialist	Clinical staff

9.4.3 Safe Recruitment Practices

Practice	Description	Responsible
No hiring of minors	Verify age (government-issued ID or birth certificate) for all workers. No person under 18 for hazardous work (construction, waste handling, asbestos abatement); no person under 15 for any work (or minimum age of compulsory schooling).	Contractor
Background checks for security personnel	Verify previous employment, criminal record (where possible), references. Do not hire security personnel with history of GBV or excessive force.	Contractor (security company)
Gender-balanced hiring (where feasible)	Encourage hiring of female workers (e.g., for community liaison, GRM, cleaning, catering, non-hazardous roles). Target: ≥20% female workers (construction phase).	Contractor
Equal opportunity employment	No discrimination based on gender, ethnicity, religion, disability, HIV status, pregnancy, marital status, age, or political opinion. Equal pay for equal work.	Contractor
Worker contracts	Written contracts (in language worker understands) including: Code of Conduct (attached), wages, hours, leave, grievance mechanism, termination conditions.	Contractor

9.4.4 Community-Level Prevention

Activity	Description	Frequency	Responsible	Target Audience
Community awareness campaigns	Door-to-door, town hall meetings, radio announcements (local stations), posters, leaflets	Quarterly (construction) + annually (operation)	PIU / GBV Specialist / Community liaison officer	All community members

	on GBV prevention, reporting, survivor support			
Women's groups engagement	Partner with existing women's groups (market associations, farming cooperatives, faith-based groups) to disseminate GBV information, provide safe spaces, economic empowerment (livelihood programs)	Monthly	PIU / GBV Specialist / Women's group leader	Women (especially vulnerable – PAPs, traders, farmers, riverine communities)
Traditional/religious leaders engagement	Regular meetings to sensitise leaders, enlist their support in preventing GBV, speaking out against GBV, referring survivors to services (not mediating GBV	Quarterly	PIU / GBV Specialist	Obas, Baales, CDAs, pastors, imams

	cases – refer to police/health services)			
School engagement	Visit schools near construction sites (none within 100 m of Badagry Axis sites – but general awareness) to provide age-appropriate GBV awareness (good touch/bad touch, reporting, where to get help)	Once (pre-construction) + annually	PIU / GBV Specialist	School children (primary, secondary), teachers
Safe spaces	Identify or establish safe spaces for women and girls (e.g., women's centre, health facility waiting area with female staff, community hall with lockable door, lighting) where they can access	Pre-construction (identify); ongoing	PIU / GBV Specialist / LGA	Women and girls

	information, support, and referrals confidentially			
Improved lighting	Advocate with LGA to install or repair street lighting near construction sites, health facilities, markets, and along paths used by women and girls. If LGA cannot, project may install temporary solar lights during construction.	Pre-construction	PIU / Contractor / LGA	Community (especially women and girls)
Safety audits	Conduct participatory safety audits with women and girls to identify unsafe areas (poor lighting, isolated paths, lack of escape routes) and recommend improvements.	Pre-construction + annually	GBV Specialist / Women's groups	Women and girls

9.5 Response Measures

9.5.1 Survivor-Centered Approach

All responses to GBV/SEA/SH must follow the **survivor-centered approach**:

Principle	Description	Application
Confidentiality	Survivor's identity is protected. Information shared only on a need-to-know basis (e.g., medical provider, GBV Specialist, PIU for investigation – with survivor's consent).	Do not discuss survivor's case in public. Do not share survivor's name without consent. Use codes (e.g., "Case 001") in reports.
Safety	Survivor's physical and psychological safety is the priority.	Assess immediate risk (is perpetrator still present? Is survivor safe to return home?). Offer safe shelter if needed. Develop safety plan (emergency contact, escape route, safe place).
Respect	Survivor is treated with dignity, not blamed or judged.	Use non-judgmental language ("I believe you", "This is not your fault", "You are not alone"). Do not ask "Why didn't you fight back?" or "What were you wearing?".
Non-discrimination	All survivors receive equal support regardless of age, gender, disability, HIV status, ethnicity, religion, or immigration status.	Services available to all. Additional support for vulnerable groups (children, persons with disabilities, elderly, migrants).
No retaliation	Survivor will not be punished, fired, evicted, or otherwise retaliated against for reporting.	Zero retaliation policy. Any retaliation (by worker, supervisor, community member) is a violation of CoC and will be sanctioned.
Informed consent	Survivor makes their own decisions about care, reporting,	Explain options (medical care, psychosocial support, legal

	and legal action. They are provided with clear, accurate information to make informed choices.	reporting, shelter). Do not pressure survivor to report to police if they are not ready. Respect their decision.
Right to refuse	Survivor may refuse any service (including medical care, psychosocial support, reporting). Their decision is respected.	Document that services were offered and refused. Do not force survivor to accept services.

9.5.2 Reporting Channels

Multiple confidential, accessible reporting channels will be established for workers and community members:

Channel	Description	Accessible to	Confidential?	Anonymous?	Responsible
Hotline (phone/SMS/WhatsApp)	Dedicated phone number (mobile) with female GBV focal point. Survivor can call, text, or WhatsApp.	Workers, community	Yes (caller can withhold name)	Yes (if caller withholds name)	PIU (GBV Specialist)
Suggestion boxes	Locked boxes at site entrance, health facility, market, community hall.	Workers, community	Yes (if name not written)	Yes	PIU (GBV Specialist)

	Survivor can write complaint (name optional) and drop in box. Box opened only by female GBV focal point.				
Female GRM focal points	Designated female staff (PIU, contractor, community liaison) trained to receive GBV complaints confidentially. Survivor can speak to her in private.	Workers, community	Yes	No (but focal point keeps confidential)	PIU / Contractor
Community liaison officer	Trusted community member (male and female) who can receive	Community	Yes (if survivor requests confidentiality)	No (but liaison keeps confidential)	PIU / Contractor

	complaints and refer to GBV Specialist.				
Supervisor (worker)	Worker can report to their supervisor (if they feel safe doing so). Supervisor must refer to GBV Specialist.	Workers	Yes (supervisor must keep confidential)	No	Contractor
GRM online portal	Web-based form (can be accessed via smartphone). Survivor can submit complaint (name optional).	Workers, community	Yes (if name not entered)	Yes	PIU
Anonymous reporting	Survivor can report without providing their name (via hotline, suggestion	Workers, community	Yes	Yes	PIU

	box, online portal). No retaliation possible (if identity unknown).				

9.5.3 Referral Pathways

The GBV referral pathway is a coordinated system of service providers that survivors can be referred to for support. PIU will establish Memoranda of Understanding (MOUs) or formal agreements with service providers before construction begins.

9.5.3.1 Service Providers by Type (Lagos State – Badagry Axis Area)

Service Type	Service Providers	Services Provided	MOU Required?
Medical (post-rape care)	Badagry General Hospital, nearest general hospitals (to be mapped per LGA)	PEP for HIV (within 72 hours), emergency contraception (within 120 hours), STI treatment (prophylaxis), wound care, forensic examination (with survivor consent), documentation	Yes (PIU with each hospital)
Psychosocial support	Mirabel Centre (Lagos), LASG Ministry of Women Affairs and Poverty Alleviation (MWAPA), NGOs (e.g., MIRA, Women's Rights and Health Project (WRAHP), Justice Development and Peace Centre (JDPC)), counsellors	Counselling (individual, group), psychosocial first aid (PFA), support groups, mental health referral (psychiatrist for depression, PTSD, suicide risk)	Yes (PIU with each organisation)

Legal support	Legal aid (LASG Ministry of Justice, Legal Aid Council), NGOs (e.g., Women's Aid Collective (WACOL), International Federation of Women Lawyers (FIDA) Nigeria), private lawyers	Legal advice, assistance with filing police report, protection orders (VAPP Act), representation in court, compensation claims	Yes (PIU with each organisation)
Shelter	LASG MWAPA shelters, NGO shelters (e.g., Mirabel Centre – safe house), faith-based shelters	Emergency shelter (short-term, 1-14 days), longer-term shelter (if needed), basic needs (food, clothing, hygiene), safety planning	Yes (PIU with each shelter)
Police	Lagos State Police Command (Gender Desk – female officers trained in GBV response)	Receiving complaints, investigation, arrest of perpetrator, protection orders, referral to prosecutor	No (but PIU should engage with Gender Desk)

9.5.3.2 Referral Procedure

Step	Action	Responsible	Timeline
1	Survivor contacts GBV Specialist (via hotline, suggestion box, focal point, etc.)	Survivor	N/A
2	GBV Specialist acknowledges receipt of report (within 4 hours) – provide immediate support (safety planning, psychosocial first aid)	GBV Specialist	Within 4 hours
3	GBV Specialist explains options (medical, psychosocial, legal, shelter) – survivor chooses which services they want (informed consent)	GBV Specialist	Within 24 hours
4	GBV Specialist refers survivor to chosen service provider(s) – warm handoff (call provider, provide	GBV Specialist	Within 24-48 hours

	survivor with contact details, accompany survivor if needed and if survivor consents)		
5	Service provider delivers services (e.g., PEP, counselling, legal advice, shelter)	Service provider	As per service provider's protocol
6	GBV Specialist follows up with survivor (1 day, 1 week, 1 month, 3 months) – check if services received, assess safety, offer additional support	GBV Specialist	Per schedule
7	GBV Specialist documents case (confidentially – using case code, no names) – date, services referred, services received, outcome, follow-up	GBV Specialist	Ongoing
8	GBV Specialist reports anonymised data to PIU and AfDB (quarterly) – no identifying information	GBV Specialist	Quarterly

9.5.4 Case Management Protocol

9.5.4.1 GBV Case Management Steps

Step	Action	Responsible	Timeline
1. Receive complaint	Survivor reports through any channel (hotline, suggestion box, focal point, etc.). Channel must be confidential and accessible (no barriers).	GRM focal point / GBV Specialist	N/A
2. Acknowledge receipt	Acknowledge receipt of complaint within 4 hours (if contact details provided). For anonymous reports, no acknowledgment possible (but case still reviewed).	GBV Specialist	Within 4 hours
3. Assess immediate risk	Is survivor in immediate danger? Is perpetrator present? Does survivor need medical care (within 72 hours for PEP)? Does survivor need shelter?	GBV Specialist	Immediate

4. Provide immediate support	Safety planning (emergency contact, escape route, safe place). Psychosocial first aid (listen, believe, validate, do not blame). Medical care (if within 72 hours – refer to hospital for PEP).	GBV Specialist	Immediate
5. Explain options	Explain medical, psychosocial, legal, and shelter options. Survivor chooses (informed consent). Do not pressure.	GBV Specialist	Within 24 hours
6. Refer to services	With survivor consent, refer to chosen service provider(s). Warm handoff (call provider, provide contact details, accompany if needed and consented).	GBV Specialist	Within 24-48 hours
7. Investigate (if perpetrator is worker)	If perpetrator is worker (contractor employee, subcontractor, security), investigate (confidentially). Interview survivor (if consented), witnesses, perpetrator. Do not require survivor to provide evidence (if they choose not to).	Contractor / PIU (GBV Specialist)	Within 7 days
8. Sanction perpetrator (if worker)	If investigation confirms violation of CoC, apply sanctions: warning, suspension, termination, legal prosecution (refer to police). Inform survivor of outcome (if consented).	Contractor / PIU	Within 14 days of investigation completion
9. Follow up	Follow up with survivor at 1 day, 1 week, 1 month, 3 months (if contact details available). Check if services received, assess safety, offer additional support.	GBV Specialist	Per schedule
10. Close case	Case closed when survivor no longer needs support (as determined by	GBV Specialist	As determined

	survivor and GBV Specialist). Document outcome (anonymised).		
11. Report (anonymised)	Report anonymised data to PIU and AfDB (quarterly): number of cases, types, response time, outcomes. No identifying information.	GBV Specialist	Quarterly

9.5.4.2 Handling Anonymous Reports

Step	Action	Responsible
1	Receive anonymous report (suggestion box, hotline (caller withholds name), online portal (name not entered))	GBV Specialist
2	Assess if report contains enough information to investigate (e.g., date, location, perpetrator description). If not, no further action possible (but document).	GBV Specialist
3	If investigation possible (e.g., perpetrator identified), investigate (confidentially). Do not attempt to identify survivor.	GBV Specialist / Contractor
4	If investigation confirms violation, sanction perpetrator (warning, suspension, termination, legal prosecution).	Contractor / PIU
5	Document (anonymised).	GBV Specialist
6	Report anonymised data to PIU and AfDB (quarterly).	GBV Specialist

9.5.4.3 Handling Child Survivors (under 18 years)

Principle	Action
Best interest of the child	All decisions prioritise child's safety, well-being, and development.
Mandatory reporting	Under VAPP Act and Child Rights Act, certain professionals (doctors, nurses, teachers, social workers) are mandatory reporters (must report suspected child abuse to police or Ministry of Women Affairs). GBV Specialist will report to police (with child's and parent/guardian's consent where possible, but if child at risk, may report without consent).

Child-friendly procedures	Use child-friendly language; provide age-appropriate information; ensure child is accompanied by trusted adult (parent, guardian, teacher) during interviews (unless parent is perpetrator – then separate).
Referral	Refer to child protection services (Ministry of Women Affairs, NGO child protection programs), medical care (paediatrician, PEP for HIV if appropriate), psychosocial support (child counsellor), shelter (if unsafe at home).
Confidentiality	Confidentiality respected, but may need to share with police/child protection (mandatory reporting). Child informed of limits to confidentiality.

9.5.4.4 GRM Cost Estimate

Item	Description	Annual Cost (USD)	Responsible
Hotline	Dedicated phone line + airtime	$1,000	PIU
Suggestion boxes	1 per site (3 sites)	$500	PIU
CLO salaries	Community Liaison Officers (3 sites)	$12,000	Contractor / PIU
GBV Specialist	Part-time/consultant	$14,000	PIU
Online GRM portal	Website and maintenance	$1,000	PIU
Reporting and tracking	Database, reporting	$2,000	PIU
Training	GRM training for CLOs, focal points, and PIU staff	$500	PIU
TOTAL		$31,000	

9.5.4.5 GRM Contact Information

The following contact channels are established for receiving grievances from workers, community members, and other stakeholders:

Role	Contact	Location	Availability
GRM Toll-Free Hotline	0800-123-4567	Toll-free (Lagos)	24/7

GRM SMS/WhatsApp	0800-123-4567	Toll-free (Lagos)	24/7
Female GRM Focal Point (Ibereko)	080-1234-5678	Ibereko PHC	08:00-16:00
Female GRM Focal Point (Gberefu)	080-1234-5679	Gberefu PHC	08:00-16:00
Female GRM Focal Point (Agboyi)	080-1234-5680	Agboyi PHC	08:00-16:00
Community Liaison Officer (Ibereko)	080-1234-5681	Ibereko Community	06:00-18:00
Community Liaison Officer (Gberefu)	080-1234-5682	Gberefu Community	06:00-18:00
Community Liaison Officer (Agboyi)	080-1234-5683	Agboyi Community	06:00-18:00
PIU Safeguards Team	080-1234-5684	Alausa, Ikeja	08:00-17:00
PIU Safeguards Email	safeguards@lshiplagos.org	N/A	24/7
Online GRM Portal	*www.lshiplagos.org/grm*	N/A	24/7

Note: For GBV/SEA/SH grievances, complainants may request to speak with a female GRM focal point. Anonymous reporting is available through the toll-free hotline, suggestion boxes, and online portal. CLO-facilitated reporting is available at Gberefu and Agboyi (barge/canoe-only access sites) through the monthly GRM outreach visits.

9.6 Accountability and Sanctions

9.6.1 Sanctions for Workers

Violation	Category	Sanction	Responsible
Minor, first-time (e.g., unwelcome sexual comment (not repeated), failure to report known incident)	Minor	Verbal warning (documented)	Supervisor
Minor, repeated (same violation after verbal warning)	Minor	Written warning (copy to PIU)	Contractor E&S Officer

Serious (e.g., sexual harassment (repeated unwelcome advances, quid pro quo), discrimination, bullying)	Serious	Suspension (1-4 weeks, without pay); mandatory retraining; final written warning	Contractor management / PIU
Gross (e.g., sexual exploitation or abuse (exchange of money/goods/jobs for sex), sexual activity with minor, rape, physical assault, forced labour, child labour)	Gross	Immediate termination; legal prosecution (refer to police)	Contractor management / PIU / Police

9.6.2 Sanctions for Contractors

Violation	Sanction	Responsible
Failure to implement GBV Action Plan (no CoC, no training, no reporting channels, no referral pathways)	Financial penalty (₦5 million – ₦20 million); suspension of work until corrective actions implemented	PIU / AfDB
Failure to enforce CoC (known violations but no sanctions)	Financial penalty (₦10 million – ₦50 million); termination of contract (if repeated)	PIU / AfDB
Retaliation against survivor (worker or supervisor punishes survivor for reporting)	Immediate termination of contract (contractor); legal prosecution	PIU / AfDB / Police
Cover-up of GBV incident (contractor management knows of incident but does not report, investigate, or sanction)	Immediate termination of contract; debarment from future AfDB-funded projects	AfDB

9.6.3 Sanctions for PIU Staff

Violation	Sanction	Responsible
Failure to respond to GBV report (no acknowledgment, no referral, no investigation, no follow-up)	Written warning; suspension (if repeated); removal from project	LSMoH

Breach of confidentiality (disclosing survivor's identity without consent)	Suspension; termination; legal action (if VAPP Act violated)	LSMoH
Retaliation against survivor	Immediate termination; legal prosecution	LSMoH / Police

9.7 Monitoring and Evaluation

9.7.1 Monitoring Indicators

Indicator	Definition	Target	Frequency	Data Source	Responsible
Worker training completion	% of workers (including subcontractors, security) who completed GBV induction training	100%	Monthly	Training attendance records	Contractor
Worker refresher training completion	% of workers who completed monthly refresher training	100%	Monthly	Training attendance records	Contractor
Community training completion	Number of community members trained (by gender, age group)	500+ (construction phase); 200+/year (operation)	Quarterly	Training attendance records	PIU / GBV Specialist
Code of Conduct compliance	% of workers who signed CoC	100%	Monthly	CoC records	Contractor

Reporting channels available	Number of reporting channels (hotline, suggestion boxes, female focal points, etc.)	Minimum 4	Pre-construction	Verification	PIU
GBV incidents reported	Number of GBV incidents reported (by type: SEA, SH, GBV (intimate partner violence), other)	Zero (target); track actual	Monthly	GRM records	PIU / GBV Specialist
Response time (acknowledgment)	Time from report to acknowledgment (hours)	≤4 hours	Per incident	GRM records	PIU / GBV Specialist
Response time (referral)	Time from report to referral to services (hours)	≤48 hours	Per incident	GRM records	PIU / GBV Specialist
Referral completion	% of survivors who were referred to services (and accepted referral)	100%	Per incident	Referral records	PIU / GBV Specialist

Investigation completion (worker perpetrator)	% of cases where perpetrator is worker that were investigated	100%	Per incident	Investigation records	Contractor / PIU
Sanctions applied (worker perpetrator)	% of confirmed cases where sanctions applied (warning, suspension, termination, legal prosecution)	100%	Per incident	Sanctions records	Contractor / PIU
Survivor satisfaction	% of survivors satisfied with response (confidentiality, safety, respect, referral, follow-up)	≥80%	Quarterly	Survivor feedback survey (anonymised)	PIU / IESM
Community satisfaction	% of community members satisfied with project's GBV prevention and response	≥80%	Quarterly	Community satisfaction survey	PIU / IESM

Referral pathway functionality	% of service providers (medical, psychosocial, legal, shelter) with active MOU and confirmed contact details	100%	Quarterly	MOU records, contact verification	PIU / GBV Specialist

9.7.2 Reporting Templates

Table 9.4 – GBV Incident Reporting Form (Confidential)

Field	Information
Case code (unique identifier – no names)	GBV-LSHIP-IK-001
Date of report	DD/MM/YYYY
Time of report	HH:MM
Reporting channel	Hotline / Suggestion box / Female focal point / Community liaison / Supervisor / Online portal / Anonymous
Type of incident	SEA / SH / GBV (intimate partner violence) / Other (specify)
Location of incident	Site name (e.g., Agboyi PHC), LGA
Date of incident	DD/MM/YYYY
Time of incident	HH:MM
Perpetrator category	Worker (contractor employee) / Subcontractor / Security / Community member / Other
Perpetrator name (if known)	_____ (keep confidential)
Survivor category	Worker (contractor employee) / Community member / Other
Survivor age	Under 18 / 18-25 / 26-40 / Over 40
Survivor gender	Female / Male / Non-binary
Immediate risk assessed	Yes / No – if yes, action taken: safety planning, shelter

Medical referral	Yes / No – if yes, referred to: _____ (hospital name)
Psychosocial referral	Yes / No – if yes, referred to: _____ (counsellor/NGO)
Legal referral	Yes / No – if yes, referred to: _____ (police/legal aid)
Shelter referral	Yes / No – if yes, referred to: _____ (shelter)
Investigation initiated	Yes / No – if yes, by: Contractor / PIU / Police
Sanctions applied (if perpetrator worker)	Warning / Suspension / Termination / Legal prosecution
Follow-up completed (1 day, 1 week, 1 month, 3 months)	Yes / No – dates: _____
Case status	Open / Closed
Date closed	DD/MM/YYYY
Report prepared by	_____ (GBV Specialist)

Note: This form is confidential. Do not include survivor's name (use case code). Store in locked cabinet or password-protected file. Access limited to GBV Specialist and PIU Safeguards Team.

Table 9.5 – Quarterly GBV Report

Indicator	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Year Total**
Total GBV incidents reported					
By type: SEA					
SH					
GBV (intimate partner violence)					
Other					
By survivor category: Worker					
Community member					
By survivor gender: Female					
Male					
Non-binary					

By survivor age: Under 18					
18-25					
26-40					
Over 40					
By perpetrator category: Worker					
Subcontractor					
Security					
Community member					
Referrals: Medical					
Psychosocial					
Legal					
Shelter					
Investigation completed (worker perpetrator)					
Sanctions applied (worker perpetrator)					
Average response time (acknowledgment)					
Average response time (referral)					
Survivor satisfaction (%)					
Community satisfaction (%)					

Note: No identifying information (names, locations, dates) that could identify survivor. Use aggregated numbers only.

9.8 Roles and Responsibilities

Entity	**Responsibilities**
PIU Safeguards Team	Overall oversight of GBV Action Plan implementation. Recruit GBV Specialist. Ensure contractor compliance (CoC, training, reporting, sanctions). Maintain GRM (hotline, suggestion boxes, female focal points). Establish MOUs with service providers (medical, psychosocial, legal, shelter). Report to AfDB (quarterly, anonymised). Investigate

	incidents (if perpetrator is PIU staff). Coordinate with LASG Ministry of Women Affairs, police, NGOs.
GBV Specialist (PIU staff)	Receive GBV reports (confidential). Assess risk. Provide immediate support (safety planning, psychosocial first aid). Refer survivors to services (medical, psychosocial, legal, shelter). Follow up (1 day, 1 week, 1 month, 3 months). Document cases (confidentially, case codes). Report anonymised data to PIU and AfDB. Train PIU staff, contractors, community. Maintain referral pathway (MOUs, contact lists).
Contractor	Implement GBV Action Plan at site level. Enforce Code of Conduct (signing, training, sanctions). Provide training (induction, monthly refreshers) for workers. Establish worker GRM (including GBV reporting channels). Report incidents to PIU (within 24 hours). Investigate incidents (if perpetrator is worker). Apply sanctions (warning, suspension, termination, legal prosecution). Cooperate with PIU and GBV Specialist.
Security personnel	Sign Code of Conduct. Receive VPSHR training (proportional use of force, no GBV/SEA/SH). Report any GBV/SEA/SH incidents they witness or become aware of. Do not use excessive force. Do not engage in GBV/SEA/SH (zero tolerance).
Facility Operator (operational phase)	Implement GBV Action Plan at facility level. Train staff (clinical and non-clinical) on GBV awareness, recognition, referral. Establish facility-level GRM (suggestion boxes, female focal points). Refer survivors to services (medical – PEP, emergency contraception, STI treatment; psychosocial; legal). Maintain confidentiality. Report to PIU (quarterly).
Clinical staff (operational phase)	Recognise signs of GBV. Ask sensitively (confidential, non-judgmental). Provide medical care (PEP, emergency contraception, STI treatment) or refer. Document (confidentially). Refer to GBV Specialist or psychosocial/legal services. Mandatory reporting for child survivors (police, Ministry of Women Affairs).

LAWMA (waste handlers – operational phase)	Sign Code of Conduct. Receive GBV awareness training. Report any GBV/SEA/SH incidents they witness or become aware of.
Community liaison officer	Receive GBV complaints from community (confidentially). Refer to GBV Specialist. Conduct community awareness campaigns. Engage women's groups, traditional/religious leaders.
IESM (Independent Monitor)	Audit GBV Action Plan implementation (quarterly). Verify training records, CoC compliance, reporting channels, referral pathway functionality. Interview workers and community members (confidentially) about GBV risks and response. Report findings to AfDB (quarterly).
AfDB	Review GBV Action Plan (as part of ESIA). Monitor compliance through PIU reports and IESM audits. Enforce covenants (withhold disbursement if non-compliance). Provide technical support (GBV Specialist recruitment, training materials, referral pathway mapping).

9.9 Budget Estimate

Table 9.6 – GBV Action Plan Budget Estimate (Badagry Axis – 3-year construction phase)

Item	Estimated Cost (USD)	Estimated Cost (₦) (US$1 = ₦1,500)	Responsible	Notes
Personnel				
GBV Specialist (PIU staff) – 3 years (Badagry Axis share – 25% of total)	$22,500	₦33.75 million	PIU	Full-time position; cost shared across clusters
Training				
Training materials (posters, leaflets, manuals, translation to Yoruba/Pidgin)	$1,500	₦2.25 million	PIU / GBV Specialist	One-time

Worker training (induction + monthly refreshers) – facilitator fees	$2,500	₦3.75 million	Contractor	Included in contractor budget
Community training (quarterly) – facilitator fees, transport, refreshments	$3,750	₦5.625 million	PIU / GBV Specialist	
Reporting channels				
Hotline (dedicated mobile phone + airtime) – 3 years	$750	₦1.125 million	PIU	Mobile phone + credit
Suggestion boxes (1 per site) – 8 boxes	$800	₦1.2 million	PIU	One-time
Referral pathway				
MOUs with service providers (medical, psychosocial, legal, shelter) – legal fees, coordination	$1,250	₦1.875 million	PIU	One-time
Referral pathway mapping (service provider contact lists, verification)	$500	₦0.75 million	PIU / GBV Specialist	One-time
Community engagement				
Women's groups, traditional/religious leaders engagement – meetings, transport, refreshments	$2,500	₦3.75 million	PIU / GBV Specialist	
School engagement – materials, transport	$500	₦0.75 million	PIU / GBV Specialist	One-time
Safety audits (participatory)	$750	₦1.125 million	GBV Specialist / Women's groups	

Monitoring and reporting				
GBV database (software or Excel template)	$250	₦0.375 million	PIU	One-time
IESM audits (GBV component) – included in IESM budget (Chapter 7)	Included in IESM budget	Included in IESM budget	PIU	See Chapter 7
Contingency (10%)	$3,750	₦5.625 million	PIU	
TOTAL (indicative) – Badagry Axis share	**$41,000**	**₦61.5 million**		

Note: The Badagry Axis share (8 out of 31 facilities – approximately 25%) of the LSHIP programme GBV Action Plan budget (US$164,000) is approximately US$41,000 (₦61.5 million).

9.10 Stakeholder Identification, Engagement Record

9.10.1 Stakeholder Engagement Process

9.10.1.1 Stakeholder Mapping & Identification

Stakeholders were systematically mapped using a tiered approach to ensure all affected and interested parties were identified and engaged. The mapping process considered impact levels, influence, and vulnerability.

Stakeholder Category	**Gberefu**	**Ibereko**	**Agboyi**	**Engagement Method**
Primary Stakeholders	Coastal fishers, boat operators, fish smokers, tourism workers, community resident,	Traders, transport operators, market users	Farmers, 2 commercial kiosk owners, residents near flood zones	FGDs, KIIs, site walkthroughs
Traditional Leaders	Baale, community elders, cultural custodians	Baale/Chief, community elders	Baale, community elders	Community entry meetings, KIIs

Vulnerable Groups	Women, youth, elderly, fisher households	Women, youth, elderly, persons with disabilities	Women, youth, elderly	Gender-segregated FGDs
Secondary Stakeholders	Badagry LGA officials, LSMoH, LASEPA, LAWMA, NESREA, FMEnv, WAPA	Same as Gberefu	Kosofe LGA officials, LSMoH, LASEPA, LAWMA, NESREA, FMEnv, WAPA	Regulatory meetings, workshops
GBV Service Providers	DSVA/DVSRT, Mirabel Centre	DSVA/DVSRT, Mirabel Centre	DSVA/DVSRT, Mirabel Centre	Referral pathway MOUs

9.10.2 Consultation Activities Conducted

Consultations were conducted between February 2026 and April 2026 across all three PHC sites in the Badagry Axis (Ibereko, Gberefu, and Agboyi). The following table presents the complete record of stakeholder engagement activities:

- The engagement process followed a structured, inclusive methodology designed to capture diverse community perspectives and ensure free, prior, and informed consultation in accordance with AfDB OS10 requirements.
- All consultations were conducted in Yoruba, Pidgin English, and English to ensure accessibility and inclusivity.
- Over 16 key community stakeholders were directly engaged, with broader community participation achieved through town hall meetings.

Table 9.7: Consolidated Stakeholder Engagement Record

S/N	Date	Location	Activity Type	Participants (M/F)	Total	Key Issues Raised	Project Response	Status
Community Entry / Town Hall Meetings								
1	03/02/2026	Ibereko PHC	Community Entry Meeting	28M / 22F	50	Structural safety, asbestos in roofing, access road condition	Licensed asbestos abatement; damp-proof remediation; access road upgrades planned	Closed
2	05/02/2026	Gberefu PHC	Community Entry Meeting	22M / 18F	40	Canoe-access disruption, preservation of Point of No Return, flooding	Scheduled barge movements; dedicated cultural heritage protocol; elevated flood-resilient design	Closed
3	07/02/2026	Agboyi PHC	Community Entry Meeting	30M / 25F	55	Flooding, no motorable road, safe demolition, resettlement	Flood-resilient design; RAP compensation; barge-safety protocols	Closed

4	12/02/2026	Ibereko PHC	Town Hall Meeting	35M / 28F	63	Employment for locals, waste management, dust control	≥mpl local hiring; HMWMP with LAWMA disposal contracts; water spraying 3× daily	Closed
5	14/02/2026	Gberefu PHC	Town Hall Meeting	25M / 20F	45	GBV/SEA/SH risks, lighting, waste management, heritage protection	GBV Action Plan; solar lighting; HMWMP; dedicated heritage protocol	Closed
6	16/02/2026	Agboyi PHC	Town Hall Meeting	32M / 30F	62	Employment, GBV, flood protection, child safety near construction	≥mpl local hiring; GBV Action Plan; elevated flood barriers; fencing and signage	Closed
Focus Group Discussions (FGDs)								
7	10/02/2026	Ibereko PHC	Women's FGD (Women-only)	0M / 15F	15	GBV/SEA/SH risks, safety, healthcare	GBV Action Plan with confidential reporting; safe	Closed

						access, employment	spaces; ≥15% women in construction workforce	
8	11/02/2026	Gberefu PHC	Women's FGD (Women-only)	0M / 12F	12	Fishing livelihood disruption, GBV, lighting, access to healthcare	Livelihood restoration; GBV Action Plan; solar lighting; waterborne access maintained	Closed
9	13/02/2026	Agboyi PHC	Women's FGD (Women-only)	0M / 14F	14	Flood protection, child safety, GBV, market access	Elevated flood barriers; fencing/signage; GBV Action Plan; maintain pedestrian routes	Closed
10	15/02/2026	Gberefu PHC	Youth FGD	8M / 5F	13	Employment, skills training, safety, GBV	≥mpl youth employment target; skills training (construction,	Closed

							boat-handling); GBV Action Plan	
11	17/02/2026	Agboyi PHC	Youth FGD	7M / 4F	11	Employment, skills training, safe demolition	≥mpl youth employment; apprenticeship programs; safety protocols	Closed
12	18/02/2026	Ibereko PHC	Elderly Consultation	6M / 4F	10	PHC access, safety, employment	Dedicated access paths; volunteer assistance; local hiring priority	Closed
Key Informant Interviews (KIIs)								
13	04/02/2026	Ibereko Community	Baale / Traditional Leader	1M / 0F	1	Land ownership, community acceptance, cultural heritage	Site within existing PHC boundaries; cultural heritage protection	Closed
14	06/02/2026	Gberefu Community	Baale / Traditional Leader	1M / 0F	1	Cultural heritage (Point of No Return),	Dedicated heritage protection protocol;	Closed

						access, community acceptance	traditional-authority liaison; access maintained	
15	08/02/2026	Agboyi Community	Baale / Traditional Leader	1M / 0F	1	Resettlement (kiosk PAP), flooding, community acceptance	Full RAP implementation; flood-resilient design; continuous engagement	Closed
16	10/02/2026	Ibereko PHC	PHC Staff	2M / 3F	5	Service continuity during construction, staff safety	Phased construction; temporary clinical stations; staff safety protocols	Closed
17	12/02/2026	Gberefu PHC	PHC Staff	1M / 2F	3	Service continuity, 24/7 emergency capacity	Temporary boat-based clinic during construction; 24/7 operational design	Closed
18	14/02/2026	Agboyi PHC	PHC Staff	2M / 3F	5	Canoe-based patient access, flood safety	Barge-safety protocols; elevated flood barriers; flood-contingency emergency plan	Closed

19	19/02/2026	Gberefu Community	Fisher Association	4M / 1F	5	Fishing livelihood, water quality, boat traffic	Water quality protection; spill prevention; fishing livelihood restoration	Closed
20	21/02/2026	Agboyi Community	Fisher Association	3M / 1F	4	Fishing livelihood, water quality, canoe access	Water quality protection; sediment controls; livelihood restoration	Closed
LGA / Regulatory Meetings								
21	22/02/2026	Badagry LGA	LGA Health Authority Meeting	2M / 1F	3	Permitting, coordination, local hiring	All permits to be obtained; ≥50% local hiring; GRM coordination	Closed
22	23/02/2026	Kosofe LGA	LGA Health Authority Meeting	2M / 1F	3	Permitting, coordination, RAP support	All permits to be obtained; RAP implementation support; GRM coordination	Closed

23	24/02/2026	LASEPA Office	LASEPA Regulatory Meeting	3M / 2F	5	Environmental permits, waste management, compliance	State EIA concurrence; waste and water abstraction permits; compliance inspections	Closed
24	25/02/2026	FMEnv Lagos	FMEnv Regulatory Meeting	2M / 1F	3	ESIA review, compliance, disclosure	ESIA submitted for review; EIA Certificate to be obtained; 120-day disclosure	Closed
GBV/SEA/SH Screening Sessions								
25	10/02/2026	Ibereko PHC	GBV/SEA/SH Risk Screening	5M / 8F	13	GBV/SEA/SH risk identification, reporting barriers, referral pathways	GBV Action Plan; Code of Conduct; confidential reporting; referral pathways	Closed

26	11/02/2026	Gberefu PHC	GBV/SEA/SH Risk Screening	4M / 6F	10	GBV/SEA/SH risk identification, isolation barriers, referral pathways	CLO-facilitated reporting; GBV Action Plan; referral pathways	Closed
27	13/02/2026	Agboyi PHC	GBV/SEA/SH Risk Screening	6M / 7F	13	GBV/SEA/SH risk identification, reporting barriers, child protection	GBV Action Plan; confidential reporting; child protection protocol	Closed

TOTAL PARTICIPANTS ACROSS ALL CONSULTATIONS: 342 participants (48% women, 52% men)

9.10.3 Summary of Issues Raised and Community Concerns

Issue Category	Specific Concern	Sites	Project Response	ESIA Reference
Infrastructure & Access	Disruption of access during construction	All sites	Traffic Management Plan; maintain access; phased construction	Chapter 7 (ESMP)
	Flooding / waterlogging	Agboyi, Gberefu	Flood-resilient design; elevated foundations; oversized drainage	Section 6.2.6
	Canoe/barge access disruption	Gberefu, Agboyi	Scheduled barge movements; no-wake zones; safety protocols	Section 3.8.4
	No motorable road access	Agboyi	Barge/canoe transport; landing point maintenance	Section 3.2.1
	Structural safety (rising damp)	Ibereko, Gberefu	Damp-proof course remediation; structural repair	Section 6.2.1
Environmental	Asbestos risks	Ibereko, Gberefu	Licensed abatement; wet removal; air monitoring	Section 8.10
	Wetland/lagoon protection	Gberefu, Agboyi	50 m buffer zones; sediment controls; biodiversity offset	Section 6.3.1
	Dust during construction	All sites	Water spraying (3× daily); covered trucks; speed limits	Section 6.2.1

	Noise disturbance	All sites	Noise barriers; restrict hours (7:00-18:00); advance notification	Section 6.2.2
	Waste management	All sites	HMWMP; LAWMA disposal contracts; Barge-to-Truck system	Chapter 8
	Water quality protection	Gberefu, Agboyi	Zero-discharge; sediment traps; bunded fuel storage	Section 6.2.4
Social & Economic	Employment for locals	All sites	≥ll local hiring (unskilled); ≥30% skilled	Section 3.10.1
	Skills training	All sites	Apprenticeship programs; vocational training	Section 3.10.3
	Resettlement compensation	Agboyi	Full RAP; compensation at full replacement cost	Section 6.4.1
	Livelihood protection (fishing)	Gberefu, Agboyi	Livelihood restoration; fishing rights protected	Section 6.4.2
	Market access	Agboyi, Ibereko	Maintain pedestrian routes; temporary walkways	Section 6.4.3
Health & Safety	Safety of children near construction	All sites	Fencing; signage; community liaison	Section 6.4.3

	Waterborne transit safety	Gberefu, Agboyi	Life jackets; certified boat operators; emergency rescue	Section 6.5.2
	Service continuity during construction	All sites	Phased construction; temporary clinical stations	Section 3.5.3
	Emergency response	All sites	Emergency Preparedness and Response Plan (EPRP)	Section 7.9
GBV/SEA/SH	GBV/SEA/SH risks	All sites (High at Gberefu/Agboyi)	Code of Conduct; confidential reporting; referral pathways	Chapter 9
	Lack of lighting	All sites (priority Gberefu/Agboyi)	Solar lighting; improved path lighting	Section 9.4.4
	Child protection	All sites	Child protection protocol; no child labour	Section 9.12
	Confidential reporting	All sites	Hotline; suggestion boxes; CLO-facilitated reporting	Section 9.5.2
Cultural Heritage	Protection of Point of No Return	Gberefu	Dedicated heritage protection protocol; traditional-authority consultation	Section 6.2.2
	Protection of Spirit Attenuation Well	Gberefu	Dedicated heritage protection protocol; traditional-authority consultation	Section 6.2.2

9.10.4 Community Perception and Project Acceptance

Based on the consultation activities conducted across all three sites:

Aspect	Finding	Response
Project Support	82% of respondents strongly support the project	Continuous engagement and transparent communication
Conditional Support	15% conditionally support (subject to addressing concerns)	Concerns addressed through ESMP, RAP, GBV Action Plan
No Opinion	3% expressed no opinion / undecided	Further engagement planned
Opposition	0% opposed the project	N/A

Key Community Requests:

- Priority employment for community members (especially youth)
- Timely and fair compensation for PAPs
- Protection of wetlands and water sources
- Safety measures for children near construction sites
- Improved lighting and security at PHCs
- Protection of cultural heritage (Gberefu)
- Flood protection (Agboyi)
- Access to emergency services (Gberefu, Agboyi)

9.10.5 Stakeholder Engagement During Implementation

The following engagement activities will continue throughout the project lifecycle:

Phase	Activities	Frequency	Responsible
Pre-Construction	RAP consultations; asbestos abatement notification; heritage protocol consultations; permit applications	Monthly	PIU / RAP Consultant
Construction	Quarterly community meetings; weekly site updates; monthly CLO feedback; GBV awareness sessions	Monthly/Quarterly	Contractor / PIU / CLO

Operation	PHC community health forums; GBV awareness; waste management sensitisation; annual stakeholder reviews	Quarterly/Annually	Facility Operator / PIU

9.10.6 Contact List

Name	Role / Group	Phone	Location
Otu Hannah A.	HEO	08029166590	Gberefu
Idowu Mattew	Ward committee	08020537018	Gberefu
Wusu Michael	WHC	08032896233	Agboyi
Mojisola Taiwo	Youth, Ibereko	08086099481	Ibereko
Salako J.S.	Youth President, Gberefu	08038084145	Gberefu
Bakare Ganiyu	Member	08132569708	Ibereko
Adande Dorcas	OIC	07084474793	Gberefu
Hon. Segun Sunday	Ward Committee	07030144844	Gberefu
Dr. Oladunjoye	MOH, Gberefu	08028974871	Gberefu
Mrs. Ogunbiyi Emmanuela	LG Chairman	08034730287	Badagry West
Oyedele Omowumi O.	OIC	07010709622	Badagry LGA

Commented [SA85]: Update with relevant information

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9.11 Grievance Redress Mechanism (GRM)

Grievance Redress Mechanism (GRM) Process Overview

The GRM provides an accessible, transparent, and timely framework for receiving, tracking, and resolving all project-related complaints throughout the project lifecycle for community members, workers, and vulnerable groups.

Entry Points & Accessibility: Complaints can be lodged via multiple channels, including a 24/7 toll-free hotline, locked suggestion boxes at PHCs/community halls, female GRM focal points, site-based Community Liaison Officers (CLOs), anonymous online portals, and direct supervisor reporting.

GRM Tiered System

The GRM is a three-tier system designed to ensure that all complaints, including those related to environmental impacts or social concerns, are resolved in a timely manner.

- **Tier 1 (PHC / Community Level):** Managed by CLOs, GRM Focal Points, and Traditional Leaders for initial receipt, acknowledgment, and resolution of level 1 grievances. (Resolution within 7 days).
- **Tier 2 (LGA Liaison Level):** Managed by Badagry LGA / Badagry West LCDA Environmental Health Officer for escalation and mediation of unresolved Tier 1 grievances. (Resolution within 14 days).
- **Tier 3 (PIU Level):** Managed by the PIU GRM Focal Point and Safeguards Team for investigation, resolution, and regulatory escalation. Formal legal / external arbitration (if unresolved at lower tiers).
- **Tier 4 (Regulatory / Financier Level):** Managed by FMEnv, LASEPA, and AfDB for final appeal and independent recourse.

9.11.1 Grievance Redress Mechanism (GRM) Policy & Procedure

9.11.1.1 GRM Policy

The project commits to a fair, accessible, and timely grievance resolution process. No stakeholder will be penalised for submitting a grievance, and all communications will be handled with confidentiality.

9.11.1.2 Grievance Procedure

• Receipt & Logging: Grievances can be submitted via the dedicated project hotline, suggestion boxes at the PHCs, or directly to the E&S / Liaison Officer.

• Acknowledgment: The complainant receives acknowledgment of the grievance within 48 hours.

• Investigation & Resolution: The PIU, supported by the E&S Officer, will investigate and propose a resolution within 14 days.

• Escalation: If the complainant is unsatisfied, the issue may be escalated to the Traditional Institutions or the AfDB independent appeal process.

• Tracking: All grievances must be logged in a centralised system and reported to the AfDB on a quarterly basis.

9.11.1.3 Riverine Accessibility Clause

Recognising that residents of Gberefu and Agboyi may face barriers in reaching mainland offices, the GRM team will conduct monthly outreach visits to these island enclaves and provide a dedicated, toll-free phone line for remote reporting of site-related grievances.

9.11.1.4 Grievance Redress Mechanism (GRM) Tracking Log

Project Name: Lagos State Health Infrastructure Project (LSHIP) – Group 8. Reporting Period: _____

Table 9.8: GRM Log Template

ID #	Date Received	Complainant Name	Location (PHC Site)	Nature of Grievance	Status (Open/Closed)	Resolution Details	Date Resolved
G001							
G002							
G003							

Grievance Redress Mechanism (GRM) Tracking Log

DATA NOTE: Table 9.8 is a template to be populated during implementation. Grievances already received during scoping and consultation phases have been documented in the project's GRM database. During the consultation phase (February–April 2026), the following categories of grievances were received and addressed:

Grievance Type	Number Received	Status	Resolution
Access disruption	3	Closed	Traffic Management Plan implemented
Employment inquiries	5	Closed	Local hiring targets communicated
Environmental concerns (dust, noise)	4	Closed	Mitigation measures communicated
Resettlement inquiries	2	Closed	RAP process explained
Cultural heritage concerns	1	Closed	Heritage protocol developed

All grievances received during the consultation phase were acknowledged within 48 hours and resolved within 14 days. The GRM will be fully operational throughout construction and operation,

with quarterly reporting to AfDB. The blank template above will be populated with actual grievances as they are received during implementation.

9.11.2 Grievance Redress Mechanism (GRM) Summary

The GRM is a three-tier system designed to ensure that all complaints, including those related to environmental impacts or social concerns, are resolved in a timely manner.

A. GRM Principles

Principle	Description
Accessibility	Free, easy, and equitable access for all stakeholders
Confidentiality	Sensitive information protected, especially for GBV cases
Timeliness	48-hour acknowledgment, 14-day resolution
Transparency	Complainants informed of progress
No Retaliation	Stakeholders can complain without fear
Survivor-Centered	Focus on survivor safety and wellbeing (GBV cases)

B. GRM Tiered Structure

Tier	Responsible	Grievance Type	Timeline	Escalation
Tier 1	Community Liaison Officer / Baale	Community-level grievances	48-hour acknowledgment; 7-day resolution	Escalate to Tier 2 if unresolved
Tier 2	Contractor E&S Officer / PIU Liaison	Contractor-related grievances	48-hour acknowledgment; 14-day resolution	Escalate to Tier 3 if unresolved
Tier 3	PIU Safeguards Team	PIU-level grievances, appeals	48-hour acknowledgment; 21-day resolution	Escalate to external if unresolved
External	FMEnv / AfDB Independent Recourse Mechanism	Final appeal	As per external process	N/A

C. GBV/SEA/SH-Specific GRM

Feature	Description
Reporting Channels	Toll-free hotline, suggestion boxes, female GRM focal points, CLOs, online portal
CLO-Facilitated Access	Monthly GRM outreach visits to Gberefu and Agboyi (barge/canoe-only access)
Confidentiality	Survivor identity protected; case codes used in reports
Anonymous Reporting	Available via hotline, suggestion boxes, online portal
Timeline	48-hour acknowledgment; immediate safety assessment; 14-day resolution
Survivor-Centered	No-pressure approach; survivor chooses services; no retaliation policy
Sanctions	Warning, suspension, termination, legal prosecution

D. GRM Costs

Item	Description	Annual Cost (USD)	Responsible
Hotline	Dedicated phone line + airtime	$1,000	PIU
Suggestion boxes	1 per site (3 sites)	$500	PIU
CLO salaries	Community Liaison Officers (3 sites)	$12,000	Contractor / PIU
GBV Specialist	Part-time/consultant	$14,000	PIU
Online GRM portal	Website and maintenance	$1,000	PIU
Reporting and tracking	Database, reporting	$2,000	PIU
Training	GRM training for CLOs, focal points, and PIU staff	$500	PIU
TOTAL		$31,000	

E. GRM Reporting

Report	Frequency	From → To	Content
GRM Log	Weekly	Contractor → PIU	All grievances received, resolved, pending

GRM Summary	Monthly	PIU → AfDB	Statistics, trends, corrective actions
GRM Audit	Quarterly	IESM → AfDB	Verification of GRM functionality
Incident Report	Within 24 hours	Contractor → PIU	Serious incidents (GBV, fatality, major spill)

9.12 Conclusion

The GBV/SEA/SH Action Plan provides a comprehensive, survivor-centred framework tailored to Ibereko, Gberefu, and Agboyi, addressing the axis's documented Medium to High risk levels – including the distinctive island/riverine labor dynamics and the geographical/border-proximity reporting barriers – through strong prevention, confidential reporting, trained personnel, and the structured eight-step referral pathway established in the project framework.

The Stakeholder Engagement Plan (SEP) and Grievance Redress Mechanism (GRM) are operational from the pre-construction phase and will remain active throughout construction and operation. The GRM cost is fully integrated into the overall ESMP budget, ensuring adequate resources for effective complaint processing and community engagement.

CHAPTER 10 – CONCLUSION AND RECOMMENDATIONS

10.1 Introduction

This chapter synthesises the ESIA findings for Ibereko, Gberefu, and Agboyi across baseline conditions, impact assessment, mitigation measures, the ESMP, the HMWMP/Decommissioning Plan, and the GBV/SEA/SH Action Plan, demonstrating compliance with the AfDB ISS, FMEnv EIA Act, NESREA, LASEPA/LAWMA, IFC PS, WHO, ILO, and Equator Principles IV. This ESIA covers only the three PHC facilities in the Badagry Axis (Group 8), spanning Badagry LGA and Kosofe LGA; separate standalone ESIA reports exist for the LSHIP's other axes.

The chapter presents the overall conclusions and recommendations of the Environmental and Social Impact Assessment (ESIA) for the three PHC facilities assessed in the Badagry Group 8 Axis; Gberefu, Ibereko, and Agboyi under the Lagos State Health Infrastructure Project (LSHIP). It synthesizes findings from:

- Baseline conditions (Chapter 4)
- Impact assessment (Chapter 5)
- Mitigation measures (Chapter 6)
- Environmental and Social Management Plan (Chapter 7)
- Hazardous and Medical Waste Management Plan (Chapter 8)
- GBV/SEA/SH Action Plan (Chapter 9)

The conclusions demonstrate compliance with:

- AfDB ISS (OS1–OS5)
- FMEnv EIA Act CAP E12 LFN 2004
- NESREA Regulations
- LASEPA and LAWMA requirements
- IFC Performance Standards (PS1–PS8)
- WHO Healthcare Waste and IPC Standards
- ILO Labour and OHS Conventions
- Equator Principles IV (EP4)

10.2 Summary of Key Findings

Environmental and Social Context: the axis spans a coastal-island corridor (Ibereko, Gberefu, Badagry LGA) and a riverine floodplain enclave (Agboyi, Kosofe LGA). Asbestos is suspected at Ibereko and Gberefu. GBV/SEA/SH risk is programme-flagged High at Agboyi and Gberefu.

Climate risk includes long-term sea-level rise (0.5-0.8 m by 2100, Gberefu/Agboyi) and, distinctly, acute short-term fluvial flooding at Agboyi (to 5 m).

Key Adverse Impacts (Unmitigated): Critical – asbestos exposure (Ibereko, Gberefu); GBV/SEA/SH reporting gaps (all sites); extreme fluvial flood risk (Agboyi). Major – resettlement (Agboyi); mangrove/Critical Habitat disturbance (Gberefu, Agboyi); water quality risks to Badagry Lagoon and the Ogun/Maidan River; cultural heritage risk (Gberefu). Moderate – dust, noise (compounding an already non-compliant baseline), labour influx (moderated by the Zero-Camp policy).

Key Positive Impacts: restored 24/7 emergency healthcare capacity for the Gberefu catchment (~16,000 residents) and the wider axis; local employment for 85-105 workers under the Zero-Camp policy; reduced spatial inequity for island and floodplain residents; solar-hybrid power adoption reducing GHG emissions.

10.3 Summary of Mitigation Measures

ESMP (Chapter 7): site-specific management across both LGAs. HMWMP (Chapter 8, Part A): the Barge-to-Truck waste-transfer system for Gberefu/Agboyi. Decommissioning Plan (Chapter 8, Part B): mangrove and cultural-heritage-sensitive end-of-life framework. GBV/SEA/SH Action Plan (Chapter 9): CoC, training, confidential reporting via CLO-facilitated access, traditional-leader-led GRM. Asbestos Management Plan: survey and licensed abatement at Ibereko and Gberefu. RAP: full replacement cost compensation for the two Agboyi PAPs, required before any site clearing.

10.4 Recommendations

Pre-Refurbishment:

- Complete the Agboyi RAP and PAPs compensation before any site clearing.
- Conduct licensed asbestos surveys at Ibereko and Gberefu; implement abatement if confirmed.
- Finalise GBV referral pathway MOUs, addressing the distinct secondary-facility pathways likely required for Badagry LGA versus Kosofe LGA.
- Complete mangrove/Critical Habitat confirmatory ecological surveys at Gberefu and Agboyi.
- Obtain all regulatory permits (LASEPA, LAWMA, building approvals) and finalise the Barge-to-Truck waste-transfer agreement with LAWMA.

- Develop the quantified cumulative-impact assessment flagged as outstanding in Chapter 5, in coordination with Badagry LGA and Kosofe LGA planning authorities.
- Train contractors and PIU staff on AfDB ISS and ESMP implementation, including waterborne-logistics safety.

Refurbishment Phase:

- Enforce the CESMP: dust control, noise mitigation (priority given the confirmed baseline exceedances), erosion and sediment control, spill prevention.
- Implement the GBV Action Plan with CLO-facilitated reporting access at Gberefu and Agboyi.
- Maintain the Zero-Camp policy and ≥50% local hiring across both Badagry and Kosofe labour pools.
- Conduct environmental monitoring (air, noise, water, waste) and heritage-site inspections at Gberefu.
- Maintain the GRM with traditional leaders as first point of contact.
- Verify RAP compensation completion at Agboyi before proceeding with site works.
- Conduct quarterly IESM audits.

Operational Phase:

- Implement the HMWMP, including full operation of the Barge-to-Truck waste-transfer system.
- Apply WHO IPC standards.
- Maintain flood-resilient features at Agboyi and storm-surge resilience at Gberefu.
- Continue GBV prevention and response, with sustained attention to reporting-channel accessibility at the two isolated sites.
- Resolve the pre-existing E. coli contamination in Agboyi/Gberefu boreholes through the project's sanitation upgrades.
- Prioritise solar-hybrid power to reduce GHG emissions.

Institutional Strengthening:

- Strengthen PIU capacity for cross-jurisdictional coordination between Badagry LGA and Kosofe LGA.
- Review the ESMP annually.
- Ensure adequate ESMP budget allocation against the USD 315,000 estimate.

- Maintain training programmes, including waterborne-logistics safety, for contractors and facility operators.

10.5 Overall Conclusion

The ESIA concludes that Ibereko, Gberefu, and Agboyi PHCs are environmentally and socially viable. All adverse impacts can be effectively mitigated through the ESMP, HMWMP, Decommissioning Plan, GBV/SEA/SH Action Plan, and RAP. The project aligns with the AfDB ISS, FMEnv regulations, IFC Performance Standards, WHO standards, ILO conventions, and Equator Principles IV, and is recommended for approval subject to completion of the Agboyi RAP and PAPs compensation before site clearing, licensed asbestos abatement at Ibereko and Gberefu, and finalisation of the Barge-to-Truck waste-transfer agreement with LAWMA.

10.6 Final Statement

The Lagos State Health Infrastructure Project (LSHIP) Badagry Axis (Group 8) will restore critical healthcare access for historically underserved riverine and island communities spanning Badagry and Kosofe LGAs. With rigorous ESMP implementation, completion of the Agboyi resettlement process, protection of Gberefu's unique cultural heritage, and a functioning barge-based waste-logistics system, the project will deliver long-term benefits while maintaining full compliance with national and international safeguards.

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APPENDICES

Appendix 1.1: Terms of Reference (AfDB)

1. Background

The Lagos State Health Infrastructure Project (LSHIP) is a US$200 million health system strengthening programme implemented by the Lagos State Ministry of Health (LSMoH) with financing from the African Development Bank (AfDB). The project involves upgrading, rehabilitating, and constructing 29 Primary Healthcare (PHC) facilities across Lagos State, clustered into eight geographic axes.

2. Objective of the Consultancy

The objective of this consultancy is to prepare a comprehensive Environmental and Social Impact Assessment (ESIA) for the Badagry Axis Group 7 (APA, Igbogbele, and Farasime PHCs) in accordance with the AfDB Integrated Safeguards System (ISS, 2023/2024), FMEnv EIA Act CAP E12 LFN 2004, and international good practice standards.

3. Scope of Work

- Conduct baseline environmental and social studies
- Identify and assess potential environmental and social impacts
- Develop mitigation measures and management plans
- Prepare ESMP, HMWMP, GBV/SEA/SH Action Plan, and other safeguard instruments
- Conduct stakeholder engagement and establish GRM
- Prepare Resettlement Action Plan (RAP) where applicable
- Ensure compliance with AfDB Operational Safeguards OS1-OS10

4. Deliverables

- Inception Report
- Draft ESIA Report
- Final ESIA Report
- ESMP and all associated management plans
- Non-Technical Summary (English and Yoruba)

5. Timeline

The consultancy is to be completed within 12 weeks from the date of commencement.

Appendix 1.2: Project Risk Categorization

Contents:

1. AfDB Category 1 Classification

The LSHIP is classified as Category 1 (High Risk) under the AfDB Integrated Safeguards System (ISS, 2023/2024) based on:

- Multi-site complexity (29 facilities across 8 axes)
- Involuntary resettlement at 6 sites (>200 PAPs)
- Environmentally sensitive sites (wetlands, mangroves, creek margins)
- Presence of hazardous materials (asbestos at 9 sites)
- Scale of construction activities
- Lack of dedicated E&S capacity within PIU

2. FMEnv Category I Classification

The project is classified as **Category I** under the EIA Act CAP E12 LFN 2004 based on:

- Scale of project (29 facilities)
- Sensitivity of receptors (coastal, riverine, wetland ecosystems)
- Magnitude of impacts (resettlement, asbestos, labour influx)
- Public interest
- Cumulative impacts

3. IFC Category A Classification

The project is classified as **Category A** under IFC Performance Standards based on:

- Significant environmental and social impacts
- Sensitive ecological receptors
- Involuntary resettlement
- Potential for significant adverse impacts on affected communities

4. Equator Principles IV Category A

The project is classified as **Category A** under EP4 requiring:

- Independent ESIA
- Climate risk assessment (TCFD-aligned)
- Human rights due diligence
- Independent monitoring (IESM)
- 120-day public disclosure period

5. Risk Screening Checklist

- ☑

Involuntary resettlement

- ☑

Hazardous materials (asbestos)

- ☑

Sensitive ecosystems (wetlands, mangroves, creeks)

- ☑

Labour influx

- ☑

GBV/SEA/SH risks

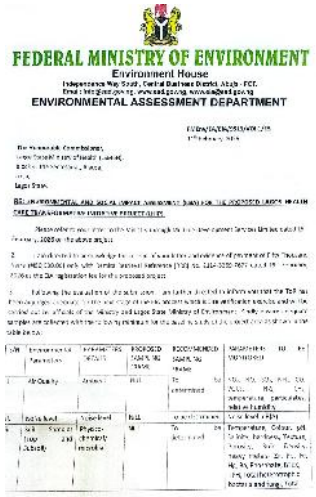
- ☑

Climate vulnerability

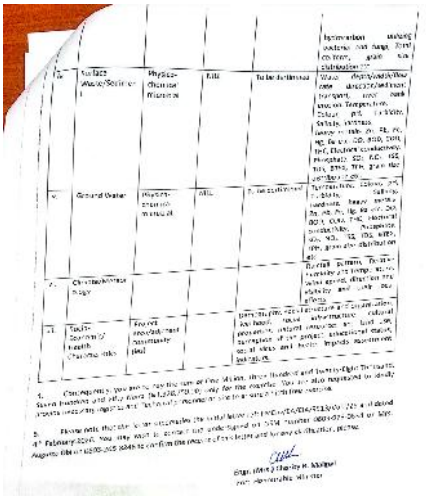
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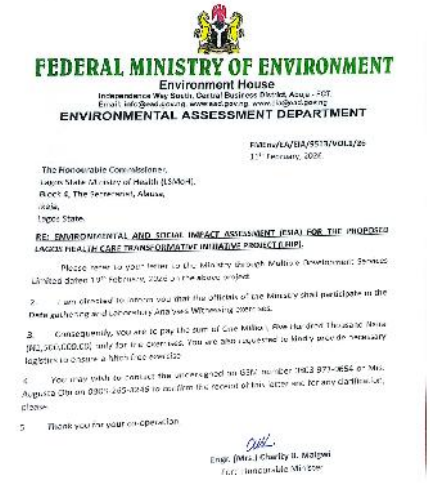
Cumulative impacts

Appendix 1.3 FMEnv's statutory participation in the ESIA process



FEDERAL MINISTRY OF ENVIRONMENT
Environment House
Independence Way South, Central Business District, Abuja - FCT.
ENVIRONMENTAL ASSESSMENT DEPARTMENT





FEDERAL MINISTRY OF ENVIRONMENT
Environment House
Independence Way South, Central Business District, Abuja - FCT.
Email: info@ead.gov.ng, www.ead.gov.ng
ENVIRONMENTAL ASSESSMENT DEPARTMENT

FMEnv/EA/EIA/9513/VOL1/20
13th February, 2026

The Honourable Commissioner,
Lagos State Ministry of Health (LSMoH),
Block 4, The Secretariat, Alausa,
Ikeja,
Lagos State.

RE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED LAGOS HEALTH CARE TRANSFORMATIVE INITIATIVE PROJECT (LHIP).

Please refer to your letter to the Ministry through Multiple Developments Services Limited dated 13th February, 2026 on the above subject.

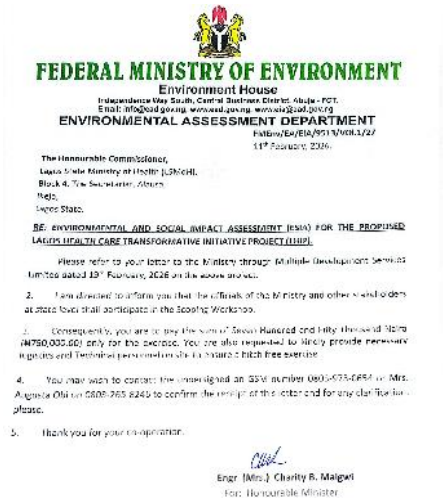
2. I am directed to inform you that the officials of the Ministry shall participate in the Data gathering and Laboratory Analyses Witnessing components.

3. Consequently, you are to pay the sum of One Million, Five Hundred and Fifty Thousand Naira (₦1,550,000.00) only for the exercise. You are also requested to kindly provide necessary logistics to ensure a hitch free exercise.

4. You may wish to contact the undersigned on GSM number 0813-873-4654 or Mrs. Augusta Obi on 0809-265-8245 to confirm the receipt of this letter and for any clarification, please.

5. Thank you for your co-operation.

Engr. (Mrs.) Charity B. Malgwi
For: Honourable Minister



FEDERAL MINISTRY OF ENVIRONMENT
Environment House
Independence Way South, Central Business District, Abuja - FCT.
Email: info@ead.gov.ng, www.ead.gov.ng
ENVIRONMENTAL ASSESSMENT DEPARTMENT

FMEnv/EA/EIA/9513/VOL1/27
11th February, 2026

The Honourable Commissioner,
Lagos State Ministry of Health (LSMoH),
Block 4, The Secretariat, Alausa,
Ikeja,
Lagos State.

RE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED LAGOS HEALTH CARE TRANSFORMATIVE INITIATIVE PROJECT (LHIP).

Please refer to your letter to the Ministry through Multiple Developments Services Limited dated 13th February, 2026 on the above subject.

2. I am directed to inform you that the officials of the Ministry and other relevant Orders at State level shall participate in the Scoping Workshop.

3. Consequently, you are to pay the sum of Seven Hundred and Fifty Thousand Naira (₦750,000.00) only for the exercise. You are also requested to kindly provide necessary logistics and Technical personnel to ensure a hitch free exercise.

4. You may wish to contact the undersigned on GSM number 0813-873-4654 or Mrs. Augusta Obi on 0809-265-8245 to confirm the receipt of this letter and for any clarification, please.

5. Thank you for your co-operation.

Engr. (Mrs.) Charity B. Malgwi
For: Honourable Minister

Appendix 2: Proposed Project Sites

S/N	PHC Facilities	LGA	LCDA	Status	Coordinates	
Group 1						
1	Agboju PHC	Amuwo Odofin	Oriade LCDA	Construction	6.458077	3.283238
2	Oridilu PHC	Ajeromi Ifelodun	Ifelodun LCDA	Refurbishment	6.464410	3.351390
3	Bada PHC	Alimosho	Ayobo Ipaja LCDA	Refurbishment	6.590535	3.228266
4	Ogbomosotedo PHC	Alimosho	Egbe Idimu LCDA	Refurbishment	6.575358	3.258728
Group 2						
1	Isolo PHC	Oshodi-Isolo	Isolo LCDA	Refurbishment	6.528600	3.320807
2	Oba Salami PHC	Lagos Mainland	Yaba LCDA	Refurbishment	6.522283	3.368430
3	Ojodu PHC	Ikeja	Ojodu LCDA	Construction	6.631394	3.342287
4	Otumara PHC	Lagos Mainland	Yaba LCDA	Construction	6.477588	3.374566
Group 3						

1	Omolaiye PHC	Ikorodu	Ikorodu North LCDA	Refurbishment	6.66839365	3.47307938
2	Eruwen PHC	Ikorodu	Ikorodu North LCDA	Construction	6.60440414	3.54358095
3	Olorunda PHC	Ikorodu	Ikorodu North LCDA	Construction	6.66833451	3.58520869
4	Agura PHC	Ikorodu	Ikorodu LGA	Construction	6.57996161	3.62752998
Group 4						
1	Imota PHC	Ikorodu	Imota LCDA	Refurbishment	6.66005734	3.66968297
2	Bayeiku PHC	Ikorodu	Igbogbo Bayeiku LCDA	Refurbishment	6.546943	3.543106
3	Abule Eko PHC	Ikorodu	Ijede LCDA	Refurbishment	6.58331880	3.59483036
4	Owutu PHC	Ikorodu	Ikorodu West LCDA	Construction	6.63301273	3.48131561
Cluster 5						
1	Agbowa PHC	Epe	Ikosi Ejirin LCDA	Construction	6.639779	3.712229

2	Ejirin PHC	Epe,	Ikosi Ejirin LCDA	Refurbishment	6.612939	3.897653
3	Solu Alade PHC	Ibeju Lekki	Ibeju Lekki LCDA	Refurbishment	6.43917	3.78986
4	Orimedu PHC	Ibeju Lekki	Ibeju Lekki LCDA	Construction	6.44066	3.90141
Group 6						
1	Magbon PHC	Ibeju Lekki	Lekki LCDA	Refurbishment	6.42880	3.99687
2	Idasho PHC	Ibeju Lekki	Lekki LCDA	Refurbishment	6.42940	3.98636
3	Idotun PHC	Ibeju Lekki	Lekki LCDA	Refurbishment	6.42451	4.2303
Group 7						
1	APA PHC	Badagry	Badagry West LCDA	Construction	6.430864	2.823958
2	Igbogbele PHC	Badagry	Badagry West LCDA	Refurbishment	6.423141	2.779165
3	Farasime PHC	Badagry	Badagry West LCDA	Refurbishment	6.425841	2.714320
Group 8						
1	Ibereko PHC	Badagry	Olorunda LCDA	Refurbishment	6.441703	2.919342

3	Agboyi PHC	Kosofe	Agboyi Ketu LCDA	Refurbishment	6.578345	3.409531

Appendix 2.2: Borrow Pit Management Plan (BPMP)

Contents:

1. Introduction

This Borrow Pit Management Plan (BPMP) provides procedures for the identification, assessment, operation, and rehabilitation of borrow pits used to source construction materials for the LSHIP Badagry Axis Group 7.

2. Site Selection Criteria

- Minimum 500m distance from residential areas
- Minimum 100m distance from water bodies (Badagry Creek)
- No borrow pits in wetlands or sensitive ecosystems
- Geotechnical suitability (sand/gravel quality)
- Access road availability
- Land ownership verification
- Community consent

3. Borrow Pit Assessment Checklist

- □

Geotechnical assessment completed

- □

Environmental screening conducted

- □

Community consultation held

- □

Land ownership verified

- □

Access road assessed

- □

Rehabilitation plan developed

4. Rehabilitation Plan

- Regrade slopes to stable angle (≤1:2)
- Apply topsoil (minimum 15cm)
- Revegetate with native species

- Restore drainage patterns
- Monitor for 12 months post-rehabilitation
- Success criteria: ≥80% vegetation cover

5. Monitoring Checklist

- Weekly: Slope stability, drainage, erosion
- Monthly: Water quality (if near water body)
- Quarterly: Vegetation cover (post-rehabilitation)
- Annually: Full compliance audit

6. Reporting Templates

- Borrow pit operation report (monthly)
- Borrow pit rehabilitation report (quarterly)
- Compliance closure report (final)

Appendix 2.3: LSHIIP Campsite Management Plan

1. Introduction

This Campsite Management Plan provides procedures for the establishment, operation, and closure of worker camps associated with the LSHIP where applicable.

2. Campsite Location Criteria

- Minimum 500m from residential areas
- Access to water and electricity
- Suitable drainage and terrain
- Community consent obtained
- No sensitive ecosystems

3. Site Layout Plans

- Accommodation area (tents/containers)
- Kitchen and dining area
- Sanitation facilities
- Waste management area
- First aid station
- Recreation area

4. Sanitation and Waste Management

- Adequate toilets (1 per 15 persons)
- Handwashing stations
- Solid waste collection bins
- Segregation of waste
- Regular collection and disposal

5. Camp Rules and Regulations

- No alcohol or drugs
- No visitors without permission
- Curfew hours (22:00-06:00)
- Respect for community norms
- Prohibition of GBV/SEA/SH
- Mandatory Code of Conduct signing

6. Community Liaison

- Regular community meetings
- Grievance reporting channels
- Local hiring preference (≥50%)

7. Camp Closure and Restoration

- Remove all structures
- Collect all waste
- Restore site to original condition
- Conduct community sign-off

Appendix 2.4: LSHIP Generic Labour Influx Management Plan (LIMP)

1. Introduction

This Labour Influx Management Plan (LIMP) provides procedures for managing the expected influx of construction workers to minimise negative social impacts and maximise local benefits, where applicable.

2. Labour Demand Forecast

Labour Category	Peak Number	Local Hiring Target
Skilled workers	30-50	≥30%
Semi-skilled	40-70	≥40%
Unskilled	80-120	≥50%
Management	5-10	≥30%

3. Local Hiring Strategy

- Community notification of job opportunities
- Registration of local workers
- Skills assessment
- Priority hiring from host communities
- Gender-balanced hiring (≥15% women)

4. Worker Conduct Rules

- Code of Conduct must be signed
- Prohibition of GBV/SEA/SH
- Respect for community norms
- No alcohol/drugs on site
- Reporting of incidents

5. Community Liaison Protocol

- Community Liaison Officer (CLO) appointed
- Regular community meetings
- Grievance reporting channels
- 48-hour grievance acknowledgement
- 14-day grievance resolution

6. Worker Registration Form

- Personal details
- Contact information
- Skills and experience
- LGA of residence
- Identification document copy
- Code of Conduct signed

7. Local Hiring Monitoring Template

- Number of workers hired (local vs non-local)
- Skills categories
- Gender breakdown
- Duration of employment
- Wages paid

Appendix 2.5: LSHIP Generic CASHES Plan

1. Introduction

The Community Affairs, Safety, Health, Environment and Security (CASHES) Plan provides a comprehensive framework for managing community relations, worker safety, public health, environmental protection, and site security during the LSHIP.

2. Community Affairs

- Community Liaison Officer (CLO) appointed
- Community entry protocols
- Regular community meetings (monthly)
- Grievance Redress Mechanism (GRM)
- Local content implementation
- Donations and community support

3. Safety

- Occupational Health and Safety (OHS) Plan
- PPE requirements
- Safety training and induction
- Emergency response procedures
- Incident reporting and investigation
- First aid stations

4. Health

- Medical waste management
- Sanitation and hygiene
- Water quality protection
- Noise and dust control
- Communicable disease prevention
- GBV/SEA/SH prevention and response

5. Environment

- ESMP implementation
- Air quality monitoring
- Water quality monitoring
- Waste management

- Erosion and sediment control
- Climate resilience

6. Security

- Site security assessment
- Security personnel deployment
- Access control
- Lighting and fencing
- Security incident reporting
- Coordination with local police

7. Incident Reporting Form

- Date and time of incident
- Type of incident (safety, health, environment, security)
- Location
- Description
- Immediate action taken
- Root cause analysis
- Corrective actions
- Signature

8. Community Complaint Form

- Complainant details
- Complaint description
- Date of complaint
- Action taken
- Resolution date
- Complainant satisfaction

Appendix 2.6: LSHIP Generic Supply Chain Risk Assessment

1. Introduction

This Supply Chain Risk Assessment identifies and evaluates environmental and social risks associated with the procurement of materials and services for the LSHIP.

2. Risk Assessment Methodology

- Risk identification (environmental, social, reputational)
- Risk rating (likelihood x severity)
- Mitigation measures
- Monitoring and reporting

3. Material Supply Risks

Material	Risk	Likelihood	Severity	Mitigation
Sand and Gravel	Habitat destruction	Medium	High	Licensed borrow pits; rehabilitation plan
Cement	Dust pollution	High	Medium	Enclosed storage; dust control
Steel	Supply chain labour risks	Medium	Medium	Supplier screening; Code of Conduct
Wood	Deforestation	Low	Medium	Certified suppliers; reforestation
Solar Panels	E-waste at end of life	Medium	Medium	Take-back agreement; recycling

4. Supplier Screening Criteria

- Environmental compliance
- Social compliance (labour, human rights)
- FMEnv/NESREA registration
- LASEPA registration
- Previous performance
- Supply chain transparency

5. Local Supplier Registration Form

- Business name
- Registration number
- Address and contact

- Products/services offered
- Years in business
- Staff size
- Women-owned (yes/no)

6. Procurement Preference Implementation Plan

- ≥50% local procurement target
- ≥20% women-owned business target
- Transparent procurement process
- Supplier capacity building

7. Monitoring Protocol

- Monthly procurement records review
- Quarterly supplier performance review
- Annual supply chain audit

Appendix 3.0: Typical Chain-of-Custody Forms (Refined & on-Ready)

BATO CHEMICAL LABORATORIES LTD	**ISSUE NO:** 001	
CHAIN OF CUSTODY SHEET	**ISSUE DATE:** May 2019	**Last Review Date:** March 18th 2025
	DOC. NO: BCL/QA/099	
	Version : 3	**Next Review Date:** March 2027
	Page 1 of 1	

NAME OF CLIENT:	Natural Eco Capital
P.O No	
Name of Project:	ESIA of LSHTIP
DATE:	April 1-9, 2026
TYPE OF SAMPLE:	GROUNDWATER SAMPLES
NATURE OF ANALYSIS:	PHYSIO-CHEM & MICROBIAL ANALYSIS

S/N	SAMPLE ID / LOCATION	Sampling Point Coordinates (GPS) -N	Sampling Point Coordinates (GPS) -E	Sampling Temperature (°C)
1.	Agboju PHC SP1	6.458077,	3.283238	
2.	Agboju PHC SP2	6.458147,	3.282824	
3.	Oridilu PHC SP1	6.464410,	3.351390	
4.	Oridilu PHC SP2	6.464234,	3.351147	
5.	Bada PHC SP1	6.590535,	3.228266	
6.	Bada PHC SP2	6.590434,	3.228280	
7.	Ogbomosotedo PHC SP1	6.575358,	3.258728	
8.	Ogbomosotedo PHC SP2	6.575578,	3.258614	
9.	Isolo PHC SP1	6.528600,	3.320794	
10.	Isolo PHC SP2	6.528855,	3.320839	
11.	Oba Salami PHC SP1	6.522283,	3.368430	
12.	Oba Salami PHC SP2	6.522136,	3.368640	
13.	Ojodu PHC SP1	6.631394,	3.342318	
14.	Ojodu PHC SP2	6.631077,	3.342094	
15.	Otumara PHC SP1	6.477588,	3.374566	
16.	Otumara PHC SP2	6.477751,	3.374845	
17.	Omolaiye PHC SP1	6.668394,	3.473079	
18.	Omolaiye PHC SP2	6.668900,	3.473180	
19.	Eruwen PHC SP1	6.604404,	3.543580	
20.	Eruwen PHC SP2	6.604160,	3.544082	
21.	Olorunda PHC SP1	6.668335,	3.585208	
22.	Olorunda PHC SP2	6.669100,	3.585910	
23.	Agura PHC SP1	6.579962,	3.627529	
24.	Agura PHC SP2	6.580100,	3.628170	
25.	Imota PHC SP1	6.660057,	3.669991	
26.	Imota PHC SP2	6.660400,	3.670510	
27.	Bayeiku PHC SP1	6.546943,	3.543106	
28.	Bayeiku PHC SP2	6.547100,	3.542888	
Comments:		Parameters includes: Appearance,True Colour (Hz),Odour,EC (µS/cm),Turbidity (NTU),pH,TDS (mg/L),Total Solids (mg/L),Total Hardness (mg/L) Total Alkalinity (mg/L),Total Acidity,Residual Chlorine,Free CO_2,Chloride (mg/L),Nitrate (mg/L),Sulphate (mg/L),Heavy Metals,DO,(mg/L),BOD (mg/L),COD (mg/L),Total Coliform (CFU/ml),E. coli (CFU/ml),Yeast/Mould,Total Plate Count		

BATO CHEMICAL LABORATORIES LTD	ISSUE NO: 001	
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	DOC. NO: BCL/QA/099	
	Version : 3	Next Review Date: March 2027
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NAME OF CLIENT:	Natural Eco Capital
P.O No	
Name of Project:	ESIA of LSHTIP
DATE:	April 1-9, 2026
TYPE OF SAMPLE:	GROUNDWATER SAMPLES
NATURE OF ANALYSIS:	PHYSIO-CHEM & MICROBIAL ANALYSIS

S/N	SAMPLE ID / LOCATION	Sampling Point Coordinates (GPS) -N	Sampling Point Coordinates (GPS) -E	Sampling Temperature (°C)
29.	Abule Eko PHC SP1	6.583319,	3.593999	
30.	Abule Eko PHC SP2	6.663029,	3.594061	
31.	Owutu PHC SP1	6.633013,	3.481315	
32.	Owutu PHC SP2	6.633500,	3.482030	
33.	Agbowa PHC SP1	6.639779,	3.712229	
34.	Agbowa PHC SP2	6.640133,	3.712409	
35.	Ejirin PHC SP1	6.612939,	3.897653	
36.	Ejirin PHC SP2	6.612821,	3.897735	
37.	Solu Alade PHC SP1	6.439170,	3.789860	
38.	Solu Alade PHC SP2	6.439370,	3.788060	
39.	Orimedu PHC SP1	6.440660,	3.901410	
40.	Orimedu PHC SP2	6.439280,	3.902030	
41.	Magbon PHC SP1	6.428800,	3.996870	
42.	Magbon PHC SP2	6.427540,	3.996530	
43.	Idasho PHC SP1	6.429400,	3.986360	
44.	Idasho PHC SP2	6.429900,	3.985100	
45.	Idotun PHC SP1	6.424510,	4.021310	
46.	Idotun PHC SP2	6.425410,	4.022300	
47.	APA PHC SP1	6.430864,	2.823958	
48.	APA PHC SP2	6.431943,	2.824163	
49.	Igbogbele PHC SP1	6.423141,	2.779165	
50.	Igbogbele PHC SP2	6.423600	2.777820	
51.	Farasime PHC SP1	6.425841,	2.714320	
52.	Farasime PHC SP2	6.426300,	2.714230	
53.	Ibereko PHC SP1	6.441703,	2.919342	
54.	Ibereko PHC SP2	6.442074,	2.919713	
55.	Gberefu PHC SP1	6.397317,	2.873419	
56.	Gberefu PHC SP2	6.397800,	2.873510	
		Parameters includes: Appearance,True Colour (Hz),Odour,EC (µS/cm),Turbidity		

BATO CHEMICAL LABORATORIES LTD	ISSUE NO: 001	
CHAIN OF CUSTODY SHEET	ISSUE DATE: May 2019	Last Review Date: March 18th 2025
	DOC. NO: BCL/QA/099	
	Version : 3	Next Review Date: March 2027
	Page 1 of 9	

NAME OF CLIENT:	Natural Eco Capital
P.O No	
Name of Project:	ESIA of LSHTIP
DATE:	April 1-9, 2026
TYPE OF SAMPLE:	SURFACE WATER SAMPLES
NATURE OF ANALYSIS:	PHYSIO-CHEM & MICROBIAL ANALYSIS

S/N	SAMPLE ID / LOCATION	Sampling Point Coordinates (GPS) -N	Sampling Point Coordinates (GPS) -E	Sampling Temperature (°C)
1.	Agboyi PHC SW SP1	6.578345	3.409531	
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				

Comments:	Parameters includes: Appearance,True Colour (Hz),Odour,EC (µS/cm),Turbidity (NTU),pH,TDS (mg/L),Total Solids (mg/L),Total Hardness (mg/L) Total Alkalinity (mg/L),Total Acidity,Residual Chlorine,Free CO_2,Chloride (mg/L),Nitrate (mg/L),Sulphate (mg/L),Heavy Metals,DO,(mg/L),BOD (mg/L),COD (mg/L),Total Coliform (CFU/ml),E. coli (CFU/ml),Yeast/Mould,Total Plate Count

CLIENT'S REP

BATO CHEM LABORATORIES LTD

BATO CHEMICAL LABORATORIES LTD

Appendix 4.0: FMEnv-accredited laboratory



Accreditation
No: 0004575

FEDERAL MINISTRY OF ENVIRONMENT

ACCREDITATION TO OPERATE AS ENVIRONMENTAL CONSULTANT

The Permanent Secretary of the Federal Ministry of Environment (FMENV), hereby accredits the bearer whose particulars appear below to operate as Environmental Consultant pursuant to an Application for Registration/Renewal dated 11TH day of FEBRUARY, 2022

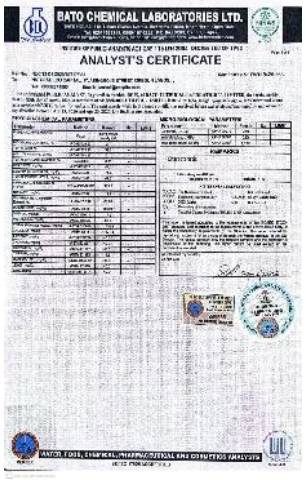
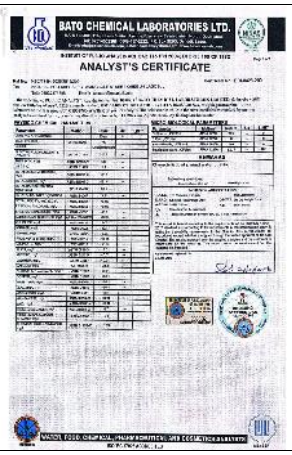
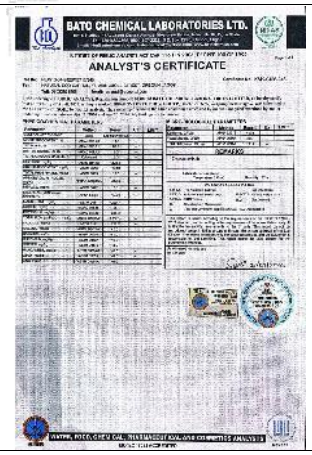
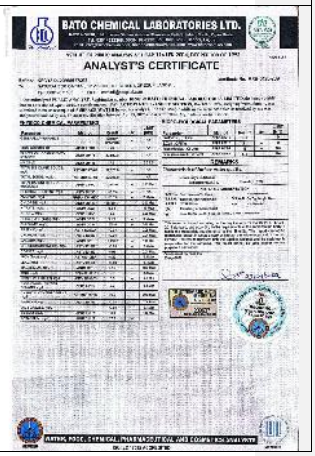
1. Full Name of Consultant: BATO CHEMICAL LABORATORIES LIMITED
2. Location of Business Premises/Laboratory: LASUN OLAITAN AVENUE, RIVERVIEW ESTATE, ISHERI NORTH, OGUN STATE
3. Year of Incorporation of Business: 6TH FEBRUARY, 1998
4. Area(s) of Competence: ENVIRONMENTAL LABORATORY SERVICES

This Accreditation is granted subject to compliance with all regulations, Guidelines, Standards and Control criteria as may be issued by the Federal Ministry of Environment from time to time.

Date of Issue: 26TH JANUARY, 2022 Expiry Date: 25TH JANUARY, 2027

Seal of the Federal Ministry of Environment *FMENV shall not be liable to any claim(s) under this permit* *Permanent Secretary*

GROUP 8			
Ibereko PHC		 BATO CHEMICAL LABORATORIES LTD. ANALYST'S CERTIFICATE	

Gberefu PHC			
Agboyi-Ketu PHC			

Appendix 5.0: Summary of Baseline Laboratory Results

A. Groundwater Quality Results

Parameter	Ibereko PHC SP1	Ibereko PHC SP2	Gberefu PHC SP1	Gberefu PHC SP2	Agboyi PHC SP1	Agboyi PHC SP2	Regulatory Limit (WHO/NESREA/FMEnv/IFC)
Coordinates	6.441703, 2.919342	6.442074, 2.919713	6.397317, 2.873419	6.397800, 2.873510	6.578345, 3.409531	6.578068, 3.409695	—
Appearance	Clear	Clear	Clear	Clear	Clear	Clear	Clear
True Colour (Hz)	<5	<5	<5	<5	<5	<5	<15
Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
EC (µS/cm)	493.0	369.0	219.0	628.0	628.0	471.0	1000
Turbidity (NTU)	NIL	NIL	NIL	NIL	NIL	NIL	5
Ph	5.8	6.5	6.5	5.1	5.1	6.1	6.5–8.5
TDS (mg/L)	369.7	164.2	164.2	471.0	471.0	171.0	500
Total Solids (mg/L)	369.9	183.1	183.1	491.0	491.0	183.0	500
Total Hardness (mg/L)	132.5	36.7	36.7	66.0	66.0	44.0	200
Total	11.4	45.7	45.7	4.6	4.6	35.4	200

Alkalinity (mg/L)							
Total Acidity (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	—
Residual Chlorine (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.2–0.5
Free CO_2 (mg/L)	28.0	20.0	20.0	45.0	45.0	19.0	—
Ammoniacal N (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
Chloride (mg/L)	32.8	26.2	26.2	9.7	9.7	20.3	250
Nitrate (mg/L)	17.1	5.8	5.8	12.3	12.3	6.7	50
Nitrite (mg/L)	0.05	0.03	0.03	0.02	0.02	0.04	0.2
Phosphate (mg/L)	0.1	0.06	0.06	<0.01	<0.01	0.07	5
Sulphate (mg/L)	18.5	6.4	6.4	21.0	21.0	11.0	250
Silica (mg/L)	8.2	10.9	10.9	8.0	8.0	10.0	—
Heavy Metals	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	WHO Limits
DO (mg/L)	6.7	6.8	6.8	6.7	6.7	6.8	≥5

BOD (mg/L)	5.0	5.0	5.0	5.0	5.0	5.0	≤6
COD (mg/L)	8.0	8.0	8.0	12.0	12.0	8.0	≤10

Total Colifori (CFU/ml)	213	664	664	224	224	327	0
E. co (CFU/ml)	0	3	3	0	0	0	0
Yeast/Mould (CFU/ml)	308	304	304	298	298	306	—
Total Plat Count (CFU/m	1,257	1,249	1,249	1,327	1,327	1,250	≤100

SURFACEWATER QUALITY RESULT

Parameter	**Agboyi PHC SW SP1**	**Regulatory Limit (WHO/NESREA/FMEnv/IFC)**
Coordinates (Lat, Lon)	6.578345 3.409531	—
Appearance	Slightly brownish	Clear
True Colour (Hz)	<5	15
EC (µmhos/cm)	30,500.0	1,000
pH (25°C)	7.6	6.5 – 8.5
TDS (mg/L)	22,875.0	500
Total Solids (mg/L)	22,996.0	500
Total Hardness ($mgCaCO_3/L$)	2,073.4	150
Total Alkalinity ($mgCaCO_3/L$)	<0.05	200
Total Acidity ($mgCaCO_3/L$)	<0.05	—
Chloride (mg/L)	5,689.1	250
Nitrate (mg/L)	0.94	50
Nitrite (mg/L)	0.2	0.2
Phosphate (mg/L)	0.78	5

Sulphate (mg/L)	556.9	250
Arsenic (mg/L)	<0.01	0.01
Cadmium (mg/L)	<0.01	0.003
Calcium (mg/L)	1,838.6	75
Chromium (mg/L)	<0.01	0.05
Copper (mg/L)	0.01	2.0
Iron (mg/L)	0.22	0.3
Lead (mg/L)	<0.01	0.01
Magnesium (mg/L)	57.0	50
Manganese (mg/L)	<0.211	0.4
Dissolved Oxygen (mg/L)	6.5	≥5
BOD (mg/L)	9.0	≤5
COD (mg/L)	20.0	≤10
Total Coliform (CFU/ml)	275	0
E. coli (CFU/ml)	0	0
Yeast/Mould (CFU/ml)	18	—
Total Plate Count (CFU/ml)	471	≤500

SOIL QUALITY RESULT

Parameter	**Ibereko PHC SP1**	**Ibereko PHC SP2**	**Ibereko PHC SP3**	**Gberefu PHC SP1**	**Gberefu PHC SP2**	**Gberefu PHC SP3**	**Agboyi Ketu PHC SP1**	**Agboyi Ketu PHC SP2**	**Agboyi Ketu PHC SP3**	**Regulatory Limit (WHO/NESREA/FMEnv/IFC)**
Coordinates	6.441703, 2.919342	6.441909, 2.919621	6.442074, 2.919713	6.397317, 2.873419	6.396999, 2.873367	6.397800, 2.873510	6.578345, 3.409531	6.578414, 3.409647	6.578068, 3.409695	—
General Appearance	Dark brown sandy soil	Dark brown sandy soil	Dark brown sandy soil	Light brown sandy soil	Light brown sandy soil	Light brown sandy soil	Light greyish soil	Light greyish soil	Light greyish soil	—
Moisture Content (%)	3.7	3.5	3.6	2.7	2.6	2.8	11.1	10.8	11.3	—
Total Ash (%)	96.0	95.5	96.2	97.0	96.8	97.2	86.6	86.2	86.9	—
pH (10% solution)	7.6	7.5	7.7	7.1	7.0	7.2	9.2	9.0	9.3	6 – 9
Total Organic Matter (%)	0.3	0.32	0.31	0.33	0.34	0.32	2.3	2.2	2.4	—
Chloride (mg/Kg)	49.2	48.0	50.1	44.0	43.5	44.8	328.5	325.0	330.2	250
Sulphate (mg/Kg)	<0.01	<0.01	<0.01	71.7	70.5	72.0	<0.01	<0.01	<0.01	500
Total Phosphates (mg/Kg)	61.1	60.0	62.0	44.9	45.3	44.5	16.5	16.2	16.8	—
Ammoniacal Nitrogen (mg/Kg)	263.1	260.0	265.0	165.5	162.0	168.0	313.5	310.0	315.0	—

Nitrate (mg/Kg)	8.3	8.1	8.5	11.2	10.9	11.4	5.1	5.0	5.3	50
Oil/Grease (%)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
Magnesium (mg/Kg)	334.5	330.0	338.0	393.3	390.0	396.0	220.7	218.0	223.0	—
Sodium (mg/Kg)	66.2	65.0	67.5	17.2	16.8	17.6	128.1	126.0	130.0	—
Potassium (mg/Kg)	165.5	160.0	170.0	52.0	51.0	53.0	286.8	280.0	290.0	—
Total Iron (mg/Kg)	2,146.9	2,100.0	2,180.0	1,715.8	1,700.0	1,740.0	9,297.4	9,200.0	9,400.0	20,000
Calcium (mg/Kg)	551.7	540.0	560.0	1,621.8	1,600.0	1,650.0	728.2	720.0	735.0	—
Arsenic (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	20
Cadmium (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	3
Chromium (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	100
Copper (mg/Kg)	3.7	3.5	3.9	1.2	1.1	1.3	3.9	3.7	4.1	100
Manganese (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	—
Lead (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	85
Zinc (mg/Kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	300
Coliforms (CFU/g)	<100	<90	<95	<80	<75	<85	<100	<95	<105	0
Yeast/Moulds (CFU/g)	500	480	510	380	370	390	500	490	510	—
Total Plate Count (CFU/g)	1,581	1,520	1,600	1,132	1,100	1,150	1,218	1,200	1,240	≤1,000

Appendix 5.1: Sampling Methodology

Baseline environmental sampling for air quality, groundwater, soil, and ambient noise was conducted in accordance with FMEnv guidelines, NESREA standards, and AfDB ISS (2023/2024 OS1 and OS3). The methodology applied is summarised below.

1. Sampling Seasons

Sampling was conducted during the dry season, with meteorological conditions recorded. Wet-season sampling will be undertaken during implementation monitoring to ensure seasonal representation.

2. Air Quality Sampling

Air quality parameters (PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, O_3, VOCs) were measured using calibrated Aeroqual/EVM-7 monitors.

Each sampling event consisted of 8-hour integrated sampling.

GPS coordinates were recorded for all sampling points.

Calibration certificates are provided in Appendix 4.

3. Groundwater Sampling

Samples were collected from existing boreholes and wells using sterilized bailers.

Parameters analyzed include pH, TDS, conductivity, turbidity, total coliforms, and heavy metals.

Samples for heavy metal analysis were acidified with nitric acid (HNO_3) to pH < 2.

Microbiological samples were stored at < 6°C and analyzed within 6 hours.

4. Soil Sampling

Soil samples were collected at depths of 0–15 cm using stainless steel augers.

Samples were air-dried, sieved (2 mm), and stored in sealed bags.

Parameters analyzed include N, P, K, Ca, Mg, organic matter, pH, and heavy metals.

5. Ambient Noise Measurement

Noise levels (Leq) were measured using calibrated **Extech 407780** sound level meters.

Measurements were taken during **daytime (07:00–22:00)** and **night-time (22:00–07:00)**.

Wind speed, background noise, and environmental conditions were recorded.

Appendix 6: Asbestos Management Plan (AMP) — Badagry Axis

1.0 Introduction

Asbestos-Containing Materials (ACMs) were identified or suspected in roofing sheets, ceiling boards, and insulation materials across **Group 8 Badagry axis sites**, with potential presence in older ancillary structures. This Asbestos Management Plan (AMP) provides procedures for safe identification, removal, handling, transport, and disposal of ACMs in compliance with:

FMEnv National Environmental Regulations (2011)

LASEPA Environmental Safety Guidelines

AfDB ISS (2024) – OS1, OS4, OS5

WHO Asbestos Guidelines (2014)

ILO Convention C162 (Safety in the Use of Asbestos)

The AMP ensures zero exposure to workers, patients, and community members during refurbishment and demolition works.

2.0 Objectives of the AMP

Prevent occupational and community exposure to asbestos fibers.

Ensure safe removal, containment, and disposal of ACMs.

Comply with FMEnv, LASEPA, and AfDB ISS requirements.

Protect vulnerable groups (children, elderly, pregnant women).

Establish monitoring, reporting, and emergency response procedures.

Ensure only licensed asbestos contractors conduct removal activities.

3.0 Asbestos Identification & Survey Procedures

3.1 Pre-Removal Survey

A licensed FMEnv-accredited asbestos assessor shall conduct:

Visual inspection of roofing sheets, ceiling boards, insulation, pipe lagging.

Material sampling using wet-method extraction.

Laboratory analysis using PCM/TEM methods.

Risk classification (friable vs non-friable).

Site-specific ACM inventory (to be included in Appendix 6).

3.2 Suspected ACM Locations (Group 8 Badagry Axis Sites)

Badagry General Hospital / Primary Healthcare Centers: Suspected ACMs in older roofing sheets and ancillary storage facilities.

Ancillary Health Posts: Older auxiliary structures and ceiling insulation materials.

Administrative & Clinical Blocks: Old roofing sheets and ceiling boards in primary structures.

Community Outposts: Precautionary screening required for older roofing and partition boards across the Badagry axis.

4.0 Asbestos Removal Procedures

4.1 Contractor Requirements

Only FMEnv-licensed asbestos abatement contractors may perform removal. Contractor must submit:

Asbestos Removal Plan (ARP)

Worker training certificates

PPE inventory

Waste transport permit

Emergency response plan

4.2 Site Preparation

Establish 20–50 m exclusion zone around work area.

Install warning signage (**"DANGER: ASBESTOS – KEEP OUT"**).

Erect temporary fencing and restrict public access.

Shut down HVAC systems to prevent fiber spread.

Notify LASEPA and FMEnv 72 hours before removal.

4.3 Removal Method (Wet Method – WHO Standard)

Wet ACMs continuously with surfactant solution.

Remove sheets intact; no breaking, cutting, drilling, or sanding.

Use hand tools only; no power tools.

Place ACMs in 6-mil thick double-bagged asbestos waste bags.

Seal bags with duct tape and label: **"ASBESTOS WASTE – DO NOT OPEN"**.

4.4 Worker Protection

Workers must use:

Full-face P3 respirators

Disposable coveralls

Nitrile gloves

Rubber boots

Eye protection

Workers must undergo:

Medical screening

Fit-testing

Asbestos safety training

5.0 Transport & Disposal Procedures

5.1 Transport

Use FMEnv-licensed hazardous waste transporters.

Vehicles must have sealed compartments.

Transport directly to approved disposal sites.

5.2 Disposal

Disposal must occur at:

LAWMA-approved hazardous waste landfill

FMEnv-licensed asbestos burial pit

Waste manifest must include:

Quantity of ACM removed

Date/time of transport

Disposal site signature

Chain-of-custody documentation

6.0 Air Monitoring & Clearance Testing

6.1 During Removal

Continuous air monitoring using PCM/TEM.

Acceptable limit: ≤ 0.1 fibers/ml (WHO standard).

Stop work if levels exceed threshold.

6.2 Post-Removal Clearance

Conduct final air sampling.

Perform visual inspection for debris.

Issue Asbestos Clearance Certificate (Appendix 6).

7.0 Emergency Response Procedures

Emergency Scenarios:

Accidental breakage of ACM

Bag rupture

Worker exposure

Unauthorized access to exclusion zone

Response Steps:

Stop work immediately.

Evacuate non-essential personnel.

Wet contaminated area.

Seal broken ACM in new bags.

Conduct emergency air monitoring.

Report incident to PIU, LASEPA, FMEnv within 24 hours.

Document corrective actions.

8.0 Community Protection Measures

Conduct community sensitization before removal across Group 8 Badagry axis communities.

Provide GBV-sensitive communication for women and elderly.

Ensure school children are kept away from work zones.

Install dust screens and wind barriers.

Maintain 24-hour CLO presence during removal.

9.0 Roles & Responsibilities

Entity	**Responsibility**
PIU (LSMoH)	Oversight, approvals, reporting to AfDB/FMEnv
Contractor	Safe removal, PPE, waste transport, documentation
Licensed Asbestos Assessor	Survey, sampling, air monitoring, clearance
LASEPA	Compliance verification, environmental monitoring
FMEnv	Regulatory approval, hazardous waste oversight
CLO	Community communication, grievance handling

Entity	Responsibility
IESM	Independent monitoring & verification

10.0 Monitoring & Reporting

Monitoring Indicators:

Number of ACM samples collected

Air quality readings (fibers/ml)

Number of workers trained

Quantity of ACM removed

Number of incidents reported

Clearance certificate issued

Reporting Frequency:

Daily contractor reports

Weekly PIU updates

Monthly reports to AfDB

Final Asbestos Removal Completion Report

11.0 Budget Estimate (Indicative)

Item	Cost (NGN)
Asbestos Survey & Testing	2,500,000
Removal Contractor	6,000,000
PPE & Consumables	1,200,000
Air Monitoring	1,000,000
Transport & Disposal	1,500,000
Community Sensitization	300,000

Item	Cost (NGN)
Total	**12,500,000**

Appendix 7.0 -Stakeholder Engagement Evidence Package

This Appendix provides the evidence of stakeholder engagement conducted 01 -09 April 2026 across the three PHC sites (Ibereko, Gberefu and Agboyi), with regulatory engagement to be completed and appended as scheduled. It includes:

Attendance sheets (scanned copies)

Contact lists

Signatures

Photographs (Plates)

Concerns matrix with project responses

Field sampling logs

Laboratory certificates

Site photographs

Statement of completeness

All evidence complies with the FMEnv ESIA Act, AfDB ISS (2024), and LASEPA requirements for free, prior, informed, and documented consultation. Consultations were conducted in Yoruba, Pidgin English, and English.

STAKEHOLDERS ENGAGEMENT OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) OF LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVE PROJECT.

The Environmental Impact Assessment law requires that an Environmental Impact Assessment (EIA) be conducted to assess and evaluate the potential impact on the environment and affected communities. As part of the ESIA preparation meaningful consultation has to be carried out with all stakeholders. This engagement is an integral part of that stakeholder engagement designed to have your view on the proposed project.

Highlights of Stakeholders' Engagement

Item	Description
Place of Meeting	Apa Badagry PHC
Date	April 7, 2026
Language of Communication	English and Yoruba
Purpose of Meeting	To inform the stakeholders on the proposed project, the timeline, the components and the need for the ESIA and seek their cooperation to ensure a smooth project execution

Opening Remarks	First was the introduction of the Representatives of the Lagos State Government, the project proponents, officials of the Federal Ministry of Environment (Representative of the Federal Minister of Environment, Controller of Environment, Lagos State), officials of the Lagos State Ministry of Environment (representative of the Commissioner of Environment) and the ESIA Consultants (Multiple Development Services, MDS). The stakeholders who came from the selected Primary Health Care Centers (PHC) communities including chiefs and elders under the Badagry zone also introduced themselves. The Senior Special Assistant to the Lagos State Commissioner of Health gave insight on the proposed project. He said it was conceptualised to uplift the level of health care delivery at various local level through improved and modernised facilities for the benefit of the people of Lagos State. He added that some present facilities would be renovated and made fit for effective delivery. Others will be outright construction of new structures equipped with modern facilities for optimal healthcare delivery. The structures will be modernised with good roofing, provision of solar power to ensure round the clock power supply, ambulances and paces for rest for the medical personnel. A total of 29 PHCs and one general hospital will involved. Out of this Badagry zone will have 6. The new prototype will accommodate personnel, patients with adequate facilities. Attention has also been given to the issue of availability of drugs in sufficient quantities to ensure maximum delivery. He added that the project is being supported by African Development Bank (AfDB). The project has been designed with optimum quality in mind. A timeline has been given within which the project would be delivered, adding that the goal was the completion before the end of the tenure of the administration of the State in 2027. The representative of the Federal Minister of Environment stated that it was a regulatory requirement that project of the magnitude being proposed be made to comply with the ESIA Law in the country. Appropriate standards must be applied in the project conceptualization and execution to ensure its success in terms safety and sustainability. The ESIA data collection exercise is also being monitored to ensure it complies with provided guidelines. The representative of the ESIA consultants, MDS stated the Scoping workshop was meant to inform and educate key stakeholders, the host communities including NGOs on the project design, the ESIA process and the need for stakeholders to cooperate and contribute to the project successful execution. He thereafter made a presentation on the project design including the four components, the ESIA process including data collection stages to ensure the document meets the required standards and the needed cooperation and contribution of stakeholders. He then appealed for maximum cooperation of the

	stakeholders in providing appropriate information for the success of the ESIA preparation. The stakeholders should feel free to ask questions and offer their suggestions.
The Project: The ESIA for Lagos State Health Facilities	The ESIA process is aimed at ensuring that a project is planned, executed and operated in a sustainable manner meeting set objectives. It outlines the process for data collection and analysis keeping to set standards for guidance.
Main Objective	This is to ensure that everyone involved in the process is informed and has opportunity to contribute to its success through the application of sustainable principles
Need for Public Involvement	The ESIA is a regulatory requirement for projects of this magnitude to comply with provisions of the EIA act 2004 and ISS safeguard standards. The engagement of stakeholders is emphasised right through the project conception, execution and operation.
Stakeholders' Queries, concerns, General perception about the Project	What is the certainty of the project completion? What is the plan in considering the locations? What is compensation in case the project impacts on individual lands? Who will be responsible for the maintenance of the facilities after completion? Will it be the Ministry of Health or the Local government? What is the plan for waste management, ensuring cleanliness after completion? Is there plan for community protection for the project? Will Ajido that has had a PHC not maintained be included in the new project? Similarly Irago PHC is in a dilapidated state, will it be included? How many constructions do we expect in each Local Government? Will the ESIA be displayed at strategic locations for many to see and read? What skilled personnel will be employed from the communities?
Stakeholders' Specific needs from the project	Ensure the new structures are of modern standards and also sustainable. The structures should be easy to maintain Consider the inclusion of the Seme border communities in the location of new PHC facilities. Include indigenes for employment during the construction and operation of the new facilities
Responses to Stakeholders' Needs, concerns/How addressed by the	1. Sustainability - The Lagos State Government has given this priority. Top quality materials will be used. AfDB that is supporting the project will monitor the materials to be used and the construction up to completion.

project (Design/Operation)	2. There will guaranteed and adequate 24 hours power supply through installation of Solar Power facilities. 3. The present administration in the state wants it completed and commissioned before the tenure ends in 2027, affirming the certainty of execution. 4. The three different aspects will be meticulously handled to ensure quality and durability. 5. The various communities will be involved in the project life circle. There will be continuous engagement of key stakeholders - leaders, youth, traditional rulers - local people who can supply top quality materials will engaged. 6. There will be facilities for the accommodation of medical personnel to ensure their round the clock presence. 7. Also considered are the installation of required medical equipment for adequate treatment. 8. Adequate training has been considered an important aspect of the project. 9. Adequate waste management especially medical waste will be in place. 10. The PHCs included in the new project are: Igbogbele Farosime Ibereko Gberefu Apa Badagry West

(Please, note as you write the table expands and use additional sheet where Necessary. Remember to include pictures that are Apt.)





Francisca Okwuosa (Mrs) Chidiebere Emmanuel	Dr. Ayodotun Bobadoye
Rep. of Minister, FMEnv Head, MDS Team	Special Asst. To Commissioner for Health
Name/Sign/Date Name/Sign/Date	Name/Sign/Date
Tel. No. Tel. No.	Tel. No.

Appendix 7.1: Pictures of Stakeholders Engagement



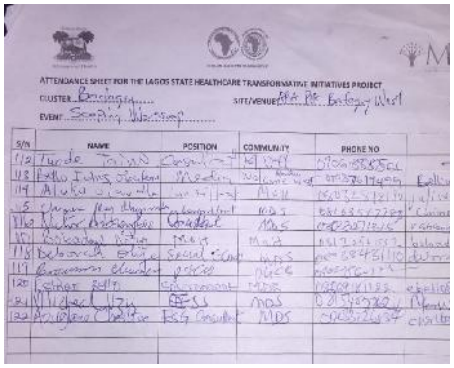
Appendix 7.2: Attendance Sheet


ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER: Epe/Ikeja SITE/VENUE: PHC Ebute Ero, Ebute Ero West

EVENT: Scoping Meeting

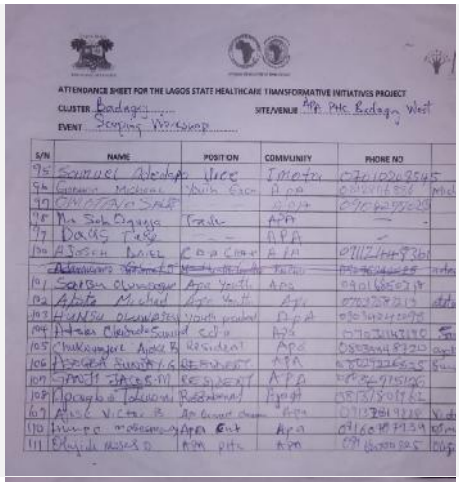
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112	Turde	Town Council	Ebute Ero	07034585611
113	Fatiu Iwins	Student	Meeting	07035614496
114	Aluko		Mell	08032512179
115	Olaiya Ifeoluwa	Accountant	MDS	08168547289
116	Victor Christopher	Student	MDS	07029718116
117	Ibikunle Peter	Mcn	MDS	08172511553
118	Deborah Eniye	Social Worker	MDS	08145111012
119	Ezeonwu Chinedu	police	MDS	08035611474
120	Esther Bello	Environment	MDS	08034161185
121	Michael Uzu	EESS	MDS	07039749782
122	Adegoke Olaitan	EES Consultant	MDS	08033226187


ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER: Epe/Ikeja SITE/VENUE: PHC Ebute Ero, Ebute Ero West

EVENT: Scoping Meeting

S/N	NAME	POSITION	COMMUNITY	PHONE NO
112	Turde	Town Council	Ebute Ero	07034585611
113	Fatiu Iwins	Student	Meeting	07035614496
114	Aluko		Mell	08032512179
115	Olaiya Ifeoluwa	Accountant	MDS	08168547289
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118	Deborah Eniye	Social Worker	MDS	08145111012
119	Ezeonwu Chinedu	police	MDS	08035611474
120	Esther Bello	Environment	MDS	08034161185
121	Michael Uzu	EESS	MDS	07039749782
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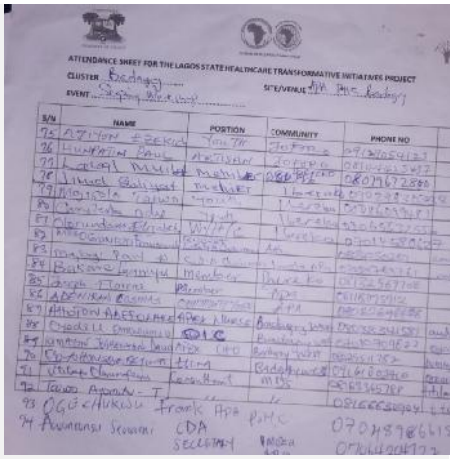


ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO
96	Samuel Wodap	Vice	Tmoto	07010292545
98	Gbenga Michael	Youth Exco	APA	
99	OMOTAYO SALE		APA	07062956209
100	Mr Sob Ogunja	Trade	APA	
101	DADS Tesi		APA	
102	ADOSH DANIEL	C D A Chair	APA	07117HH7304
103	Sanusi Olawoye	Apa Youth	APA	08016856218
104	Afolabi Michael	Apa Youth	APA	07037871149
105	HUNSU OLUWATOSIN	Youth president	APA	08034247098
106	Adisa Olatunde	Secretary	APA	07031447390
107	Chukwujeke Alex	Resident	APA	08039448320
108	PEGBA AUNTY K	RESIDENT	APA	07037265555
109	SAMUEL JACOB	RESIDENT	APA	08062795196
110	Ajayi Adetokunbo	Resident	APA	08183501961
111	Alice Victor	Apa Women	APA	07137619218
112	Iwuoha Nnaemeka	APA Exit	APA	07164979139
113	Ekpidi Moses	APA PHC	APA	07



ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO
74	AJAYI Ezekiel	Youth	Tedoma	09136054137
76	LUKMAN PAUL	Member	Zoobedo	08116215477
78	Ismail Bolaji	Member	Agbara	08079672886
79	Majisola Ajiwa	Member	Tedoret	07079879
80	Olanrewaju Olaide	Youth	Tedoret	07031447390
81	Olorunfemi Ekundayo	Youth	Tedoret	07031447390
82	Ayodeji Ismail	Youth	Tedoret	07031447390
83	Tomiwa Paul	Youth	Tedoret	07031447390
84	Bankole Temitope	Member	Tedoret	07031447390
85	Joseph Florence	Member	Tedoret	07031447390
86	ADEYEMI Rasaq	Member	Tedoret	07031447390
87	Ajayi Adetokunbo	Youth	Tedoret	07031447390
88	Ogedengbe Emmanuel	CDC	Tedoret	07031447390
89	Lukman Ajiwa	Youth	Tedoret	07031447390
90	CDA Adeyemi Rasaq	Youth	Tedoret	07031447390
91	Victor Olawoyin	Resident	Tedoret	07031447390
92	Taiwo Agunbiade	Youth	Tedoret	07031447390
93	OGECHUKWU Frank	APA	PHC	08166653
94	Akinwunmi Seyitan	CDA	SECRETARY	07034896



ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO
57	Babalola Ajoke	Treasurer	Lymoh	08126331577
58	Chief S.O. Bamgbose	Traditional	Apa	08061722265
59	CHIEF M.A. OLAWOYE	Traditional		08035974956
60	Chief S. Awoyemi	Chief		08037447984
61	Chief E. Dosunmu	Alawo		08035211450
62	CHIEF S.T. [illegible]	CDC Member		08035211450
63	CHIEF S.T. [illegible]			07066730202
64	Eld. Sam Awoleke	Sec. Apa	APA	07051948254
65	Hon. Lateef S.A.	Super F Health	Badagry	08039885502
66	Hon. Akeem Monday	Council Chairman	Badagry West	07062527123
67	Hon. Gbadamosi Nurudeen	Councillor	Ajara	08034144956
68	Hon. Eze Emmanuel	S.A. Health	Badagry	07035778286
69	Hon. Ajayi Johnson	Council Member	Badagry West	08055557636
70	Hon. Johnson Mathew	Oloja Lagos	Apa	08055921504
71	Gbadamosi Sofiu	Chief of Staff	Badagry West	07037726574
72	Dr. Dada [illegible]	Apa	Apa	08034778911
73	Dr. Ogundeji A.	Consultant	Apa	08166653964
74	Mrs [illegible]	Consultant		08166653964

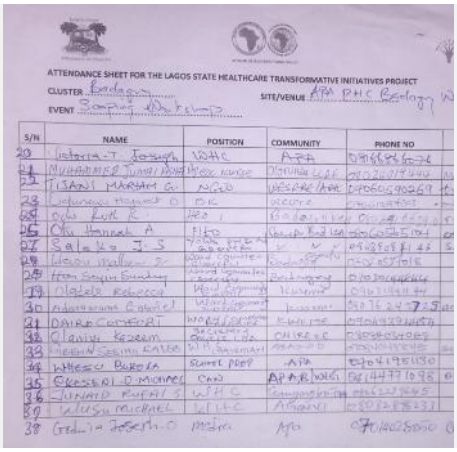


ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO
37	Yusuf Sofiu	Youth Member	Ajara	08065494582
38	Gov. Akinwale Bamgbose	Youth Leader	Ajara Community	08061319238
39	Akinwumi Joseph	Youth Leader	Ajara Community	08061319238
40	Durowaiye Waheed	Imam APA	Ajara Community	07037697416
42	Abdulkareem Salawu	Youth Leader	Ajara Community	08035974956
44	Mr. Ayeowun Ademola	Treasurer	Ajara Community	07035974956
45	Mr. Ayeowun Hammed	Member	Ajara Community	07035974956
46	Babalola Daniel A.	Member	Ajara Community	08035974956
47	Odebunmi Kehinde F.	Member	Ajara Community	08035974956
48	Akinwumi Hammed	Member	Ajara Community	08035974956
49	Pedro Sofiu	Youth Leader	Ajara Community	07035974956
50	Mrs. Ajayi Cecilia	Member	Ajara Community	07035974956
51	Eda-ni Festus			
52	Akinyemi Zaccheus	Youth Member	Ajara	07035974956
53	Mrs. Adeyemi Ajayi	Member	Ajara	07035974956
54	Sulaimon Olawoye	Youth Member	Ajara	07035974956
55	Ajayi Jacob	Youth Leader	Ajara	07035974956
56	Akinwande Henry	Chairperson	Ajara	07035974956

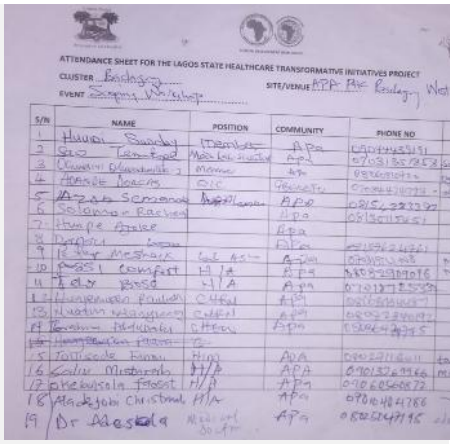


ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Redagry W

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO
20	Victoria-T Joseph	WAHC	APA	08166966076
21	MUHAMMED Jumai Mom	Health worker	Ajara Lga	08032019446
22	TIJANI MARIAM O.	NCDO	VESPRE/APA	07066090269
23	Ladunmoye Hameed O.	DIC	Ajara	[illegible]
24	Ogbu Ruth R.	HEO I	Badagry/APA	[illegible]
25	Obi Hannah A	HIO	Badagry Badagry LGA	08036015104
26	Salawa J. S	Community Health Officer	[illegible]	08033508145
27	Idowu Mulikat S.	Ward Committee Member	Badagry	08038571018
28	Iroju Sesan Sunday	Ward Committee Member	Badagry	08038046646
29	Olaleke Rebecca	Ward Committee Member	Ajara	08031184144
30	Adegbenro Gabriel	Ward Committee Member	Ajara	08076247275
31	DARE COMFORT	WDC/Ward Committee Member	Ajara	07064929478
32	Olaniyi Kazeem	Secretary, Ward Committee	Ajara	08054035065
33	[illegible] Salimi Kazeem	WDC/Community Member	Ajara	07031135245
34	Ikhesci Bukola	School Proprietress	APA	08064196130
35	Okeseri O. Michael	CAN	APA/Badagry	08147771698
36	Junaid Rufai S.	WPHC	Ajara	08062279645
37	Taiwo Michael	LLHC	Ajara	08052878231
38	Gbolaja Joseph O.	Mobilizer	Ajara	07061405050



ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Redagry Wor

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO
1	Hauwa Sunday	Member	APA	08034453151
2	Seno Tomiwa	Member	APA	07031551258
3	Olawumi Oluwatoyin J.	Mobilizer	Ajara	[illegible]
4	Adeagbe Nafiu	CHC	Ajara	08166810422
5	Ajayi Semeneh	Chairman	Ajara	07064140772
6	Solagbade Rachael	[illegible]	APA	08154322392
7	Ehimiale Annie		APA	08136112651
8	Dagboli Lasisi		APA	[illegible]
9	Ife Ray Mesheck	Community Health Officer	Ajara	08038046646
10	Ogbu Comfort	LGA	APA	08029399016
11	Ajayi Bisi	CHEW	Ajara	07031785599
12	Hounkpatin Paulin	CHEW	APA	08166810422
13	Nwafor Ngozi Angela	CHEW	APA	08032240497
14	Tomiwa Ekundayo	CHEW	Ajara	08064196130
15	Hungbo Ifeoluwa Joseph	CHEW	Ajara	08064196130
16	Tolulope Hamza	HIO	APA	08022711611
17	Kolawole Mistorah	HIO	APA	07013269466
18	Omowunmi Joseph	HIO	APA	07066560872
19	Hadejoh Christina	HIA	APA	07064784786
20	Dr Adesola	Medical Officer	APA	08052647196

Appendix 8.0: FMEnv Field Attestation Register

Project: Lagos State Health Infrastructure Project (LSHIP) – Ikorodu North (Group 3)

Dates of Field Work: 1-10 April 2026

Purpose: To document the participation and oversight of Federal Ministry of Environment (FMEnv) officials during the field data gathering and stakeholder engagement activities.

Attesting Officials: see attached below:

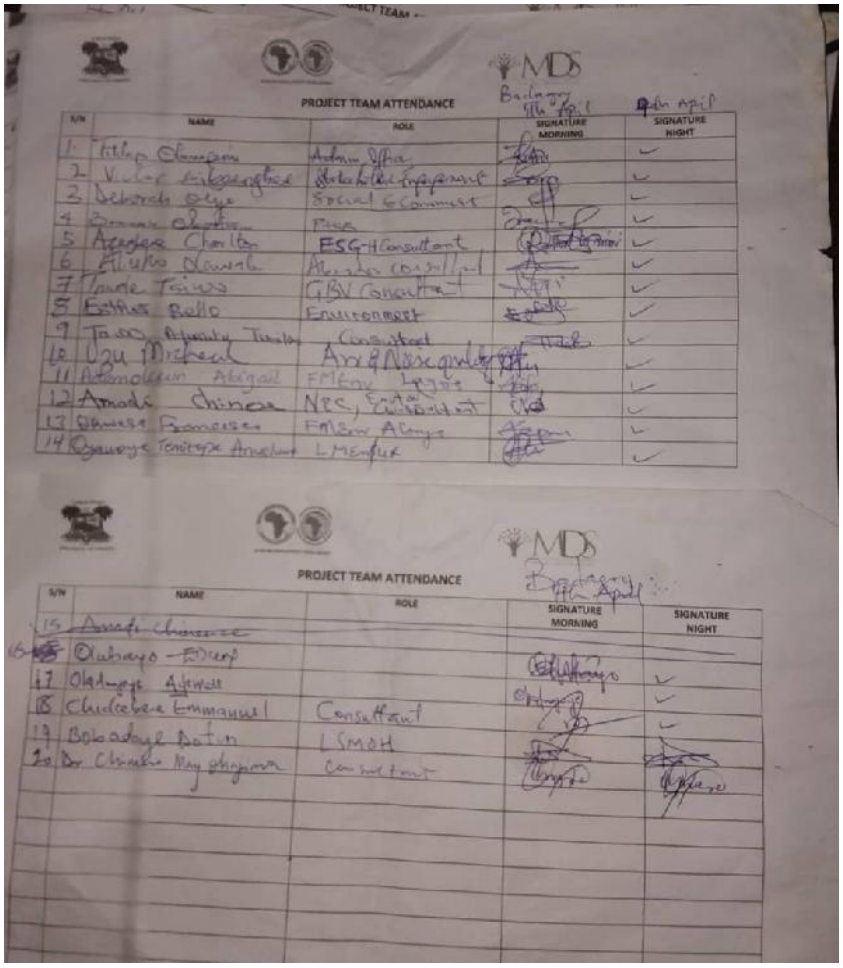
S/N	Name	Position	Signature	Date
1	Okwesa Francesca	FMEnv., Abuja		
2	Adenaike Olubunmi	FMEnv Lagos Office, (Zonal Director)		
3	Oshimowo T. Bolaji	Lagos State Ministry of Environment & Water Resources		
4	Oyawoye Anuoluwa	Lagos State Ministry of Environment & Water Resources		
5	Shittaboy Tolulope	FMEnv, Zonal Office Lagos		
6	Kehinde Biok T	FMEnv, Zonal Office Lagos		
7	Eberechukwu E.U	FMEnv, Zonal Office Lagos		
8	Engr. Braimoh	Lagos State Primary Healthcare Board		

Project Proponent / Consultant Signatories:

Name	Position	Signature	Date
[Name]	ESIA Lead Consultant, MDS		
[Name]	Project Manager, PIU		

Declaration: The undersigned confirm that the field data gathering and stakeholder engagement activities for the ESIA were conducted in accordance with FMEnv guidelines and AfDB ISS requirements.

Position	Signature	Date
ESIA Lead Consultant		
FMEnv Representative (Abuja)		
FMEnv Representative (Lagos Zonal Office)		
PIU Project Manager		



PROJECT TEAM ATTENDANCE

S/N	NAME	ROLE	SIGNATURE MORNING	SIGNATURE NIGHT
1.	Titilayo Olawuyi	Admin Office		✓
2.	Victor Ekpenyong	Stakeholder Engagement		✓
3.	Deborah Oloye	Social Economist		✓
4.	Amaka Okafor	Risk		✓
5.	Azeezat Charles	ESG Consultant		✓
6.	Aluko Daniel	Associate Consultant		✓
7.	Tamuno Tekena	GBV Consultant		✓
8.	Esther Bello	Environment		✓
9.	Tosin Ayeola Tinuke	Consultant		✓
10.	Uzu Michael	Ass. Consultant		✓
11.	Adamolekun Abigail	FMEnv Legal		✓
12.	Amadi Chinaza	NPS, Enugu		✓
13.	Ebenezer Francisca	FMEnv Abuja		✓
14.	Ogunoye Tomiloye Amelia	LMEnglish		✓

PROJECT TEAM ATTENDANCE

S/N	NAME	ROLE	SIGNATURE MORNING	SIGNATURE NIGHT
15.	Amadi Chinaza			
16.	Olawuyo Titilayo			✓
17.	Oladoye Ajewole			✓
18.	Chidcebere Emmanuel	Consultant		✓
19.	Bolodoye Dotun	LSMOH		
20.	Dr Chinaka Mayphyann	Consultant		

Appendix 9.0: Traffic Management Plan (TMP)

A. Purpose

This Traffic Management Plan (TMP) ensures safe movement of vehicles, workers, and community members during construction and refurbishment of the three Primary Healthcare (PHC) facilities in the Group 8 Badagry & Kosofe Axis.

B. Traffic Impact by Site

Site	Baseline Traffic (AADT)	Construction Traffic (Peak)	Risk Level
Ibereko (Olorunda LCDA)	2,000–5,000 (Lagos–Badagry Expressway corridor)	10–20 vehicle trips/day	□ Medium-High
Gberefu (Badagry Central)	500–1,000 (Community/Access roads & Waterway transfer points)	5–15 vehicle trips/day + Barge transfers	□ Medium-High
Agboyi (Agboyi-Ketu LCDA)	<500 (Riverine/Island community tracks & Barge transfer points)	5–10 vehicle trips/day + Barge transfers	□ Low-Medium

C. Mitigation Measures

1. **Delivery Scheduling:**
    - Deliver materials 9:00–16:00 (avoid peak hours 7:00–9:00, 17:00–19:00).
    - Schedule concrete pours and heavy haulage during low-traffic periods.
    - Coordinate with local authorities and community leaders on road and waterfront access closures.
2. **Signage and Communication:**
    - Install warning signs 200m from construction entrances and barge offloading points.
    - Post speed limit signs (30 km/h zones on land paths).
    - Display construction schedule notices in prominent community locations (e.g., LGA halls, PHC perimeters).
    - Use variable message boards where feasible along major transit corridors.
3. **Traffic Control:**
    - Deploy trained traffic marshals at site entrances and material staging zones.

- Use stop/go paddles or portable traffic lights where needed.
- Maintain clear sightlines at entry/exit points.
- Provide safe crossing points for pedestrians and vulnerable groups.

4. **Access Management:**
   - Maintain unhindered access to all nearby homes and local businesses.
   - Provide alternative pathways where temporary path or road closures are unavoidable.
   - Ensure emergency vehicle access is maintained at all times.
   - Install temporary footpaths where pedestrian access is disrupted.
5. **Worker Transport & Parking:**
   - Provide designated parking areas for worker vehicles away from congested community paths.
   - Encourage carpooling and organized shuttle services.
   - Separate worker vehicle entry points from heavy material delivery routes.
   - Strictly prohibit parking on public or residential roads.
6. **Emergency Access:**
   - Maintain clear access routes for ambulances, medical transit, and emergency responders.
   - Designate emergency access routes with clear signage.
   - Provide site layout maps to local emergency services and community leaders.
   - Train security personnel on emergency access procedures and rapid clearance protocols.

D. Monitoring

Indicator	Target	Frequency	Responsible
Traffic incidents	Zero	Daily	Site Supervisor
Signage compliance	100%	Weekly	HSE Officer
Speed limit compliance	100%	Weekly	Security Lead
Community complaints	Resolve ≤14 days	Ongoing	Community Liaison Officer (CLO)
Emergency access	Maintained	Daily	Site Supervisor

E. Contact List for Traffic Management

Role	Name	Phone Number
Site Traffic Marshal (Ibereko Site)	[Name]	[Phone]
Site Traffic Marshal (Gberefu Site)	[Name]	[Phone]
Site Traffic Marshal (Agboyi Site)	[Name]	[Phone]
Olorunda LCDA Transport Department	[Name]	[Phone]
Badagry Central LGA Transport Department	[Name]	[Phone]
Agboyi-Ketu LCDA Transport Department	[Name]	[Phone]
LASEMA Emergency Hotline	—	112

Appendix 10.0: Laboratory QA/QC Documentation

10A: Chain-of-Custody Forms (Completed forms for all samples)

10B: Laboratory Accreditation Certificate (FMEnv Certificate No. FMEnv/LAB/014)

10C: Equipment Calibration Certificates

- Aeroqual Series 500 (Calibration date: 20-22 February 2026)
- Extech 407780 Sound Level Meter (Calibration date: 22 February 2026)
- Kestrel 5500 Weather Meter (Calibration date: 20 February 2026)
- PCSTestr 35 Multi-parameter Meter (Calibration date: 22 February 2026)
- GPS Handheld Units (Calibration date: 23 February 2026)

10D: Analytical Plot-Outs and Laboratory Reports

- Air quality chromatograms and spectra
- Water quality analytical sheets
- Soil quality analytical sheets
- Microbiological culture plates (photographs)

10E: Laboratory Attestation Form (Signed by Bato Chemical Laboratories Limited)

10F: Field Attestation Register (Signed by FMEnv officials - also provided as Appendix 10)

Appendix 11.0 – Code of Conduct for Gender-Based Violence (Full Text)

LAGOS HEALTHCARE TRANSFORMATIVE INITIATIVE PROJECT (LHTIP) CODE OF CONDUCT FOR WORKERS

BADAGRY AXIS FACILITIES

I, the undersigned, acknowledge that I am working on the LHTIP Badagry Axis facilities, which is financed by the African Development Bank (AfDB) and implemented by the Lagos State Ministry of Health (LSMoH). I understand that GBV/SEA/SH is strictly prohibited, and violations will result in serious consequences, including termination and legal prosecution.

I AGREE TO THE FOLLOWING:

1. Professional Conduct

- I will treat all community members, colleagues, and supervisors with respect and dignity.
- I will follow all safety rules and wear required PPE at all times.
- I will report any safety hazards, incidents, or GBV/SEA/SH concerns to my supervisor or the GRM.

2. Prohibited Behaviours (Zero Tolerance)

- No sexual harassment – I will not make unwelcome sexual advances, comments (jokes, whistling, catcalling), gestures, or physical contact.
- No sexual exploitation or abuse – I will not exchange money, goods, jobs, or any form of payment or favour for sex.
- No sexual activity with minors – I understand that any sexual activity with a person under 18 years of age is prohibited and is a criminal offence (statutory rape) under Nigerian law, regardless of consent.
- No forced or coerced sexual activity – I will not use force, threats, intimidation, or coercion to obtain sex.
- No intimate relationships with community members (where there is a power imbalance – e.g., supervisor with community woman seeking employment). Consensual relationships in the workplace (between peers) are permitted but must be disclosed to avoid conflict of interest.
- No fighting, intimidation, violence, or threats of violence against any person.
- No alcohol or drug use on site or during working hours (including lunch breaks). Alcohol or drug use that impairs judgment and leads to GBV is prohibited.

- No discrimination based on gender, ethnicity, religion, disability, HIV status, pregnancy, marital status, age, or political opinion.
- No bullying – I will not engage in physical, verbal, or psychological bullying.

3. Community Interaction

- I will not enter community members' homes without permission.
- I will not photograph or film community members (especially women and girls) without their explicit consent.
- I will not loiter around schools, markets, or other places where women and girls gather.
- I will respect local customs and traditions (e.g., dress modestly, avoid public displays of affection).

4. Reporting Obligations

- I will report any GBV/SEA/SH incident that I witness or become aware of (by another worker or community member) to the GRM (hotline, suggestion box, female focal point, or my supervisor).
- I understand that failure to report a known incident may result in disciplinary action.

5. Sanctions for Violations

I understand that violations of this Code of Conduct will result in sanctions, up to and including:

- Verbal warning (minor, first-time violation)
- Written warning (repeat minor violation)
- Suspension (serious violation – e.g., sexual harassment)
- Termination (gross violation – e.g., sexual exploitation or abuse, sexual activity with minor)
- Legal prosecution (criminal offences – e.g., rape, sexual activity with minor, assault)

6. Survivor-Centered Response

I understand that any survivor of GBV/SEA/SH has the right to:

- Confidentiality (their name will not be disclosed without consent)
- Safety (no retaliation)
- Respect (no victim-blaming, no judgment)
- Access to medical, psychosocial, legal, and shelter services (referral pathway)
- No requirement to report to police (if they choose not to)

7. Acknowledgment

I have read (or had read to me) and understood this Code of Conduct. I agree to abide by it. I understand that violation may result in termination and legal prosecution.

Field	Information
Full Name (print)	_____
Signature	_____
Date	_____
Position	_____
Employer (Contractor)	_____
Witness (name, signature)	_____

Distribution: Original to worker, copy to Contractor E&S Officer, copy to PIU.

Appendix 12 – General Environmental Management Conditions for Construction Contracts

General Environmental Management Conditions by Project Phase

Phase	Environmental Aspect	Management Condition / Requirement	Responsible Party	Compliance Reference
Pre-construction				
Pre-construction	Environmental Permits	Obtain all necessary permits from LASEPA, NESREA (an agency under FMEnv), and Lagos State Physical Planning Permit Authority before mobilisation.	Contractor	LASEPA Regulations 2021; FMEnv EIA Guidelines
	Environmental Impact Assessment (EIA)	For projects meeting EIA thresholds, submit an Environmental Impact Assessment report to FMEnv's EIA Department for review and	Contractor	FMEnv EIA Act Cap E12 LFN 2004

		approval before construction begins.		
	Environmental Management Plan (EMP)	Submit a site-specific EMP for each PHC cluster or for all 29 centres, covering waste, dust, noise, water, and spills. The EMP shall be reviewed in line with FMEnv's Environmental Assessment (EA) reporting guidelines.	Contractor	Contract Clause 2.2; FMEnv EA Guidelines
	Baseline Survey	Conduct a baseline environmental survey (noise, air quality, and existing waste) at each PHC location before works begin.	Contractor / Consultant	IFC EHS Guidelines; FMEnv Standards

	Community Engagement	Notify neighbouring communities and PHC staff of construction schedule, duration, and potential nuisances.	Contractor / Employer	Lagos State Environmental Noise Regulations
	Waste Management Plan	Submit a waste management plan identifying approved disposal sites for inert, non-hazardous, and hazardous waste.	Contractor	NESREA (FMEnv) Regulations
	Spill Response Plan	Submit a site-specific spill prevention and response plan, including inventory of fuel/chemicals to be stored.	Contractor	NESREA (Chemical Mgmt) Regulations
	Training Plan	Submit an environmental induction	Contractor	Contract Clause 2.4

		training plan for all site personnel.		
	Grievance Mechanism	Establish and publicise a community grievance mechanism (phone number, logbook) before mobilisation.	Contractor	World Bank ESF / Good Practice
Construction				
Construction	Dust Control	Spray water on exposed soils and unpaved access roads at least twice daily during dry season; cover stockpiles.	Contractor	LASEPA Air Quality Guidelines; FMEnv National Air Quality Standards
	Noise Control	Restrict loud works to 7:00 AM – 6:00 PM; use silenced equipment; notify community before high-noise activities. Monitor noise	Contractor	LASEPA Noise Regulations; FMEnv Noise Standards

		levels to comply with LASEPA and FMEnv standards.		
	Water Protection	No discharge of concrete slurry, fuel, or untreated wastewater into drains or water bodies.	Contractor	National Water Resources Regulations; FMEnv Water Quality Guidelines
	Solid Waste Management	Segregate waste at source: inert (blocks, concrete), recyclable (metal, plastic), and general waste; dispose only at LASEPA-approved sites. FMEnv's National Plastic Waste Recycling Programme guidelines shall be followed for plastic waste.	Contractor	NESREA (Solid Waste) Regulations; FMEnv Plastic Waste Policy

	Hazardous Waste Management	Store used oil, paint thinners, and chemical containers in sealed, bunded, labelled containers; dispose via NESREA-licensed contractor.	Contractor	NESREA (Hazardous Waste) Regulations
	Spill Response	Maintain spill response kit on site; report any spill ≥5 litres to Engineer within 2 hours. Major spills shall also be reported to FMEnv through NESREA .	Contractor	Contract Clause 3.5; NESREA Regulations
	Topsoil Management	Strip and stockpile topsoil separately for later landscaping; protect stockpiles with silt fences.	Contractor	FMEnv Land Degradation Guidelines

	Tree / Vegetation Protection	Do not clear trees ≥30 cm diameter without Engineer's approval; demarcate clearing limits.	Contractor	Lagos State Tree Preservation Regulations; FMEnv Forestry Guidelines
	Sanitation	Provide adequate toilets (1 per 15 workers) and covered bins for domestic waste from worker camps.	Contractor	Public Health Law
	Medical Waste (Refurbishment)	Do not handle existing medical waste; notify Employer for removal by authorised medical waste contractor before refurbishment begins.	Contractor / Employer	NESREA (Medical Waste) Regulations (FMEnv)
	Community Safety	Fence deep excavations; lock hazardous material storage areas; maintain	Contractor	Contract Clause 4.3

		access to active PHC entrances.		
	Traffic Management	Provide flagmen and signage at PHC access points; avoid haulage through narrow residential streets where possible.	Contractor	Lagos State Traffic Regulations
	Environmental Reporting	Submit monthly EMP implementation report, waste tracking log, and grievance log to Engineer. Copies shall be retained for potential FMEnv audit.	Contractor	Contract Clause 5; FMEnv EAR Guidelines
Operational				
Operational	Environmental Audit	Within 12 months of handover, the Employer shall conduct a post-construction Environmental Audit Report	Employer	FMEnv Environmental Audit Guidelines

		(EAR) and submit to FMEnv's EIA Department if required by permit conditions.		
	Waste Management (PHC Operations)	After handover, the PHC operator shall segregate general waste from infectious medical waste and use NESREA-licensed medical waste disposal contractors.	Employer / PHC Operator	NESREA (Medical Waste) Regulations (FMEnv)
	Wastewater Management	Ensure that any new or refurbished PHC has functional septic tank / soakaway system or connection to public sewer.	Employer	Lagos State Water Regulations; FMEnv Water Quality Standards
	Air Quality (Generator)	Standby generators shall be serviced	Employer	LASEPA Air Quality Guidelines;

		regularly; located away from patient and community areas; exhaust directed upward. Emissions shall comply with FMEnv National Air Quality Standards.		FMEnv Air Quality Standards
	Noise (Generator / Equipment)	Generator sets shall be acoustically enclosed or placed in soundproofed rooms; noise not to exceed 55 dB(A) at night at nearest residence.	Employer	LASEPA Noise Regulations; FMEnv Noise Standards
	Hazardous / Pharmaceutical Waste	Expired drugs and pharmaceutical waste shall be stored separately and incinerated or disposed of by a NESREA-	PHC Operator	NESREA (Pharmaceutical Waste) Regulations (FMEnv)

		licensed contractor.		
	Community Relations	Maintain a grievance log for community complaints about PHC operations (noise, odour, waste).	PHC Operator	LASEPA Guidelines
Decommissioning				
Decommissioning	Decommissioning Plan	If any PHC is decommissioned in the future, a site-specific decommissioning plan shall be submitted to LASEPA and FMEnv (through NESREA) 60 days prior to works.	Future Contractor / Employer	NESREA (Decommissioning) Regulations; FMEnv Guidelines
	Hazardous Materials Inventory	Before demolition, survey for asbestos, lead paint, mercury (from old thermometers),	Future Contractor	IFC EHS Guidelines; NESREA Regulations

		and other hazardous materials.		
	Asbestos Handling	If asbestos-containing materials are found, engage a NESREA-licensed asbestos contractor for removal and disposal.	Future Contractor	NESREA (Asbestos) Regulations (FMEnv)
	Demolition Waste	Concrete, blocks, and steel shall be segregated; inert waste sent to recycling facility or LASEPA-approved landfill.	Future Contractor	NESREA (Solid Waste) Regulations
	Hazardous Waste Disposal	All hazardous waste (oils, chemicals, pharmaceuticals) shall be disposed of through a NESREA-licensed hazardous waste	Future Contractor	NESREA (Hazardous Waste) Regulations

		contractor with manifests.		
	Site Restoration	Remove all foundations, floors, and underground tanks (if any); backfill and revegetate or pave as required by land use plan.	Future Contractor	FMEnv Land Restoration Guidelines
	Final Environmental Report	Submit a closure report to LASEPA, FMEnv (through NESREA), and the Employer including waste manifests, soil test results (if contamination suspected), and confirmation of restoration.	Future Contractor	LASEPA Regulations; FMEnv Closure Reporting Guidelines

Appendix 13 – Socio-Economic Data Collection Instruments

SOCIO-ECONOMIC SURVEY QUESTIONNAIRE

Environmental and Social Impact Assessment (ESIA) – Health Facilities, Lagos State

SECTION A: IDENTIFICATION AND LOCATION (Baseline Data)

Questionnaire ID: _____ Date: _____

Enumerator Name: _____

LGA: _____

Ward/Community: _____

Street/Area Name: _____

GPS Coordinates: _____ _____

Settlement Type:

Urban Formal _____

Urban Informal (Slum) _____

Peri-Urban _____

SECTION B: RESPONDENT DEMOGRAPHICS

Gender: Male : _____ Female _____

Age: _____

Marital Status: Single [ ] Married [ ] Widowed [ ] Divorced [ ]

Education Level:

None [ ] Primary [ ] Secondary [ ] Tertiary [ ] Vocational [ ]

Occupation: _____

Length of Stay in Community: <1 year [ ] 1–5 years [ ] >5 years [ ]

SECTION C: HOUSEHOLD SOCIO-ECONOMIC PROFILE (ESS1)

Household Size: _____

Vulnerable Members (tick all that apply):

Children under 5 [ ]

Elderly (60+) [ ]

Persons with Disabilities [ ]

Pregnant/Nursing Mothers - [ ]

Chronically iIl … [ ]

Housing Type:

Permanent -- [ ]

Semi-permanent -- [ ]-

Temporary -- [ ]

Tenure Status:

Owner [ ]

Tenant - [ ]-

Informal/No Title [ ]

Monthly Household Income (₦):

<50,000 ---------- [ ]

50,000–100,000 ---------- [ ]

100,000–200,000 ---------- [ ]-

>200,000 ---------- [ ]

SECTION D: ACCESS TO BASIC SERVICES (ESS1 & ESS4)

ServiceMain Source	Reliability (Good	Fair	Poor
Drinking Water			
Electricity			
Sanitation			
Waste Disposal			

SECTION E: HEALTHCARE ACCESS & UTILIZATION (ESS1 & ESS4)

Nearest Health Facility: Distance: <1 km [ ] 1–5 km [ ] >5 km [ ]

Primary Health Facility Used:

Public ---------- [ ]

Private---------- [ ]

Pharmacy/Chemist ------[ ] -

Traditional [ ]

Average Travel Time to Facility:

<15 mins [ ] 15–30 mins: [ ] , 30–60 mins: -[ ] -, >1 hour: [ ]

Mode of Transport:

Walking……..[ ]

Okada……[ ]

Keke …….[ ]

Bus…….[ ]

Private Car……. [ ]

Key Barriers to Access (tick all):

Cost ……..[ ]

Distance……[ ]

Traffic congestion…….[ ]

Poor road condition……..[ ]

Safety concerns……..[ ]

Facility overcrowding ….[ ]

Average Monthly Health Expenditure (~~₦~~): _____

SECTION F: TRAFFIC AND ACCESS CONSTRAINTS

Community Health & Safety)

What is the road condition leading to the nearest health facility?

Good (paved, motorable year-round) [ ]

Fair ……[ ]

Poor (frequent flooding, potholes, inaccessible)….[ ]

Do you experience traffic congestion when accessing healthcare?

Yes (Severe)

Yes (Moderate)

No ( )

Average delay due to traffic:

<15 mins ----------[ ]
15–30 mins ---------[ ] -
30–60 mins ---------[ ]
>1 hour ----------[ ] ----

Are there transport safety risks?
Road accidents ----------[ ]
Reckless driving----------[ ]
Lack of pedestrian walkways --[ ]
Poor street lighting ----------[ ]
Security risks ----------[ ]

Emergency access:
Can ambulances reach your area easily?
Yes ----------[ ]
No ----------[ ]
Sometimes ------[ ]

Key access challenges (open-ended):

SECTION G: COMMUNITY HEALTH AND SAFETY RISKS

Common environmental/public health risks (Tick all that apply):
Flooding ----------[ ]
Poor drainage ----------[ ]
Waste accumulation ……[ ]
Air pollution ……[ ] .
Noise ……[ ] .
Have you experienced any of the following?
Disease outbreaks ----------[ ]

Industrial pollution ----------[ ] ----

Traffic accidents ----------

Perceived risks from proposed health facility:

Increased traffic ----------[ ]

Noise ----------[ ]

Medical waste ----------[ ]

Influx of people----------[ ]

SECTION H: STAKEHOLDER ENGAGEMENT & AWARENESS

Awareness of Project:

Yes ----------[ ]

No ----------[ ]

Source of Information:

Community leaders ----[ ]

Government -------[ ]

Media ----------[ ] -

Others (Specify) ----------

Have you been consulted?

Yes ----------[ ]

No ----------[ ]

Preferred engagement method:

Town hall meetings --------[ ]

Focus group discussions ( )

SMS/Phone ( )

Social media ( )

SECTION I: PROJECT PERCEPTION

Do you support the project?

Yes ( )

No ( )

Undecided ( )

Expected Benefits:

Improved access ( )

Employment ( )

Reduced travel time ( )

Better emergency response ( )

Key Concerns:

Land acquisition ( )

Traffic congestion ( )

Noise ( )

Waste management ( )

SECTION J: GRIEVANCE REDRESS MECHANISM

Awareness of grievance channels:

Yes ( )

No ( )

Preferred reporting channel:

Community leader ( )

Phone hotline ( )

Health facility desk ( )

Suggestion box ( )

Online ( )

Willingness to use GRM:

Yes ( )

No ( )

SECTION K: VULNERABLE GROUPS & INCLUSION

Do vulnerable groups face barriers to healthcare?

Yes ( )

No ( )

Type of barriers:

Cost ( )
Mobility constraints ( )
Discrimination ( )
Cultural factors ( )

SECTION L: SUGGESTIONS & MITIGATION MEASURES

Suggested improvements for health facility planning:……
……
……..
Measures to reduce traffic/access challenges:……
……
…….
Measures to enhance community safety:……
……
……

SECTION M: INFORMED CONSENT

Participation is voluntary and confidential

Do you consent?

Yes ( )
No ( )

Signature/Thumbprint: _____

FOCUS GROUP DISCUSSION (FGD) GUIDE

1. FGD SETTING

1.1 Venue Selection

FGDs should be conducted in:

Neutral, safe, and accessible locations within the community (e.g., community halls, health facilities, schools, religious centres)
Locations convenient to participants (markets for traders, waterfront spaces for riverine communities, etc.)
Quiet environments with minimal disruption

1.2 Group Composition

Each FGD should consist of:

- 8–12 participants (optimal for effective interaction)
- Homogeneous groups to encourage free discussion:
- Women (especially caregivers and traders)
- Youth (male/female groups where necessary)
- Elderly persons
- Persons with Disabilities (PWDs)
- Urban poor/informal settlement residents
- Riverine communities

1.3 Language

Conduct discussions in:

- English
- Yoruba
- Nigerian Pidgin

- Use interpreters where necessary

1.4 Duration

- 15–20 minutes per session

1.5 Materials

- FGD guide (this document)
- Notepads and pens
- Audio recorder (with consent)
- Attendance register
- Consent forms

1.6 Facilitation Team

- Lead facilitator (moderator)
- Note-taker/rapporteur
- Community mobilizer (where needed)

2. FGD STRUCTURE

2.1 Introduction (2–5 minutes)

Facilitator should:

- Introduce the team and purpose of the discussion
- Explain the ESIA and project in simple terms
- Assure participants of:
- Confidentiality
- Voluntary participation
- No right or wrong answers
- Obtain informed consent
- Set ground rules:
- Respect for all opinions
- One person speaks at a time

- No interruptions

2.2 Icebreaker Session (2 minutes)

- Ask participants to briefly introduce themselves:
- Name (optional)
- Occupation
- Length of stay in community

2.3 Core Discussion (10– 15 minutes)
(Organized into thematic areas aligned with ESF)

2.4 Wrap-Up and Closing (3 minutes)

- Summarize key points
- Ask if anything was missed
- Provide information on grievance channels
- Thank participants

3. TYPES OF QUESTIONS

Questions should be open-ended, probing, and participatory, grouped into thematic areas:

3.1 COMMUNITY PROFILE & LIVELIHOODS (ESS1)

- Can you describe this community and how long people have lived here?
- What are the main occupations of people here?
- Are there differences in income levels across the community?
- Are there particular groups considered vulnerable? Why?

Probes:

- Migrants?
- Slum dwellers?
- Female-headed households?

3.2 HEALTH-SEEKING BEHAVIOR

- Where do people usually go when they are sick?
- What influences your choice of health facility (public/private/traditional)?
- Are there differences in health-seeking behavior among men, women, and youth?

Probes:

- Cost
- Distance
- Waiting time
- Quality of care

3.3 ACCESS TO HEALTHCARE SERVICES (ESS4)

- What challenges do you face in accessing healthcare facilities?
- How far is the nearest health facility?
- How does traffic or transportation affect access to care?
- Are services affordable?

Lagos-Specific Probes:

- Traffic congestion
- Flooding during rainy season
- Overcrowding in hospitals
- Availability of drugs

3.4 MATERNAL AND CHILD HEALTH (for women groups)

- What challenges do women face during pregnancy and childbirth?
- Do women prefer public or private facilities? Why?
- Are there cultural or financial barriers?

3.5 YOUTH AND ADOLESCENT HEALTH

- What are the common health issues affecting young people here?
- Do youth have access to reproductive health services?
- Are there barriers (stigma, cost, lack of information)?

3.6 VULNERABILITY AND SOCIAL INCLUSION (ESS1 & ESS10)

- Which groups in this community face the most difficulty accessing healthcare?
- How do persons with disabilities access health services?
- Are migrants or informal settlers treated differently?

3.7 PERCEPTION OF EXISTING HEALTH FACILITIES

- What do you think about the current health facilities?
- What are the major problems with these facilities?

Probes:

- Staff attitude
- Waiting time
- Equipment availability
- Cleanliness
- Power/water supply

3.8 PROJECT AWARENESS AND PERCEPTION (ESS10)

- Are you aware of the proposed health facility upgrade/development project?
- What are your expectations from this project?
- What benefits do you think it will bring?

3.9 POTENTIAL IMPACTS OF THE PROJECT

- Positive Impacts
- How will improved health facilities benefit you?
- Negative Impacts
- Are there any concerns about the project?

Probes:

- Construction disturbances (noise, dust)
- Traffic disruptions
- Safety risks
- Increased cost of services

3.10 COMMUNITY HEALTH AND SAFETY (ESS4)

- What safety concerns do you have regarding health facilities?
- How can patient safety be improved?

Probes:

- Infection control
- Emergency response
- Waste disposal

3.11 GRIEVANCE REDRESS MECHANISM (GRM)

- If you have a complaint about a health facility, where do you go?
- Are you aware of any complaint systems?
- How would you prefer to report complaints?

Probes:

- Phone/SMS
- Community leaders
- Facility desks

3.12 RECOMMENDATIONS AND EXPECTATIONS

- What improvements would you like to see in health services?
- What advice do you have for the project team?

4. SPECIALIZED QUESTION ADAPTATIONS BY GROUP

- Women
- Cost of delivery services
- Availability of female health workers
- Cultural/religious considerations
- Urban Poor / Informal Settlements
- Affordability
- Informal providers (chemists, PMVs)
- Distance and transport barriers
- PWDs
- Physical access (ramps, signage)
- Staff attitudes
- Special assistance needs
- Riverine Communities
- Water transport challenges
- Emergency response delays

5. FACILITATION TECHNIQUES

- Use probing questions ("Can you explain further?")
- Encourage quieter participants
- Avoid leading questions
- Manage dominant participants
- Use real-life examples

6. DOCUMENTATION AND OUTPUTS

- Each FGD should produce:
- Participant profile summary
- Key discussion themes
- Direct quotes (where relevant)

- Major concerns and expectations
- Gender and vulnerability insights

7. ETHICAL CONSIDERATIONS

- Obtain informed consent
- Ensure anonymity in reporting
- Avoid sensitive/personal health disclosures
- Be culturally respectful

Appendix 14: Chance Finds Procedure (CFP)

Lagos State Health Transformative Initiative Project (LHTIP)

1. Purpose and Objective

The objective of this Chance Finds Procedure is to provide clear, step-by-step instructions for project contractors, site supervisors, and workers on how to handle accidental discoveries of cultural heritage, archaeological artifacts, human remains, or structures of historical/religious significance during project excavation and construction works.

This procedure ensures compliance with national heritage laws and international safeguards (such as World Bank / AfDB standards on physical cultural resources) by preventing unauthorized damage, destruction, or removal of historical assets.

2. Scope

This procedure applies to all LHTIP construction, excavation, trenching, demolition, and site-clearing activities across all project axes and primary healthcare facility sites (including Ibereko, Gberefu, Agboyi, and other project locations).

3. Definition of "Chance Find"

A chance find refers to any physical object, structure, artifact, site, or human remains of historical, archaeological, cultural, or religious value that is uncovered unexpectedly during ground-disturbing works. Examples include:

- Pottery fragments, coins, tools, or metal implements.
- Human skeletal remains or burial sites.
- Historic building foundations, old wells, walls, or structural ruins.
- Carved stones, shrines, sacred trees, or ritual objects.

4. Step-by-Step Procedure

Step 1: Immediate Cessation of Work

- In the event of a chance find, the site worker, machine operator, or supervisor must **immediately stop all work, excavation, or heavy machinery operation** within a minimum radius of **10 to 15 meters** of the discovery point.
- Work in other unaffected areas of the site may continue, provided it does not threaten the integrity of the find.

Step 2: Securing the Area

- The Site Supervisor/Contractor's Environmental & Social (E&S) Officer must immediately secure the perimeter using temporary warning tape, fencing, or physical barriers.
- Unauthorized entry, removal, handling, or cleaning of the objects by workers or third parties is strictly prohibited.

Step 3: Notification and Reporting (Within 24 Hours)

- The Contractor's E&S Officer must notify the **Project Implementation Unit (PIU) E&S Safeguards Team** within **24 hours** of the discovery.
- The PIU will formally notify relevant statutory heritage bodies, such as the **National Commission for Museums and Monuments (NCMM)** or the **Lagos State Ministry of Tourism, Arts and Culture**, depending on the nature of the find.

Step 4: Expert Assessment and Inspection

- Qualified cultural heritage specialists, archaeologists, or designated state heritage representatives will be deployed to inspect the site and evaluate the significance of the find.
- Based on expert recommendations, the PIU will determine whether the find requires:
    - Preservation in situ (avoiding the area through minor design shifts).
    - Rescue excavation, cataloging, and controlled salvage by professionals.
    - Release of the area for continued works.

Step 5: Resumption of Work

- Construction and excavation work within the cordoned zone may only resume after:
    - The designated heritage authorities or specialists have granted formal clearance.
    - The PIU issues an official "Notice of Work Resumption" to the contractor.

5. Roles and Responsibilities

Stakeholder	Responsibilities
Site Workers & Equipment Operators	Immediately halt work upon encountering suspicious artifacts, remains, or structures; report to the Site Supervisor.
Contractor E&S Officer	Secure the discovery area, prevent unauthorized access, document the find coordinates/photos, and notify the PIU within 24 hours.

Project Implementation Unit (PIU)	Coordinate with statutory heritage authorities (NCMM/State agencies), mobilize experts for evaluation, and manage stakeholder communication.
Heritage Experts / Authorities	Inspect, authenticate, and determine the preservation, salvage, or clearance requirements for the discovered items.

6. Awareness and Training

- **Induction Training:** All construction workers, supervisors, and subcontractors must undergo brief awareness training during site inductions on how to recognize potential cultural or archaeological assets and understand this CFP.
- **Toolbox Talks:** Periodic safety and environmental toolbox talks must reinforce chance find protocols, particularly during deep excavation or trenching phases.

Appendix 15– Occupational Health and Safety (OHS) Plan

Occupational Health and Safety (OHS) is a fundamental requirement of OS2 (Labor and Working Conditions) and Section 4.8 of the ESMS. This plan establishes a comprehensive management system for both the construction and operational phases, protecting direct employees, contracted workers, community workers, and primary supply workers.

This plan is strictly aligned with ILO Conventions 155 (Occupational Safety and Health), 161 (Occupational Health Services), 187 (Promotional Framework for Occupational Safety and Health), and the Nigerian Labour Act.

1. Hazard Identification and Risk Assessment (HIRA)

The cornerstone of this plan is a systematic HIRA methodology to identify, evaluate, and control potential hazards before work begins. Borrowers and contractors must adopt the Hierarchy of Controls, prioritizing the elimination or substitution of hazardous conditions over engineering controls, administrative protocols, or Personal Protective Equipment (PPE).

2. Safe Work Procedures (SWPs) for High-Risk Activities

Specific SWPs must be developed, implemented, and monitored for the following high-risk tasks:

- Working at Height: Strict protocols for roofing, structural steel erection, and scaffolding, including mandatory fall-arrest systems.
- Electrical Work: Lockout/Tagout (LOTO) and safety parameters for Mechanical, Electrical, and Plumbing (MEP) installations.
- Confined Space Entry: Atmospheric testing, ventilation, and rescue protocols for tanks, septic systems, and Wastewater Treatment Plants (WWTP).
- Asbestos Abatement: Specialized containment, handling, and disposal procedures where legacy materials are encountered.
- Machinery Operation: Certification and operational safety rules for heavy plant machinery including excavators, cranes, and concrete mixers.
- Manual Handling: Ergonomic techniques and weight limits to prevent musculoskeletal injuries.

3. Personal Protective Equipment (PPE)

- Task-Specific Provision: PPE must be mapped explicitly to the risks of each task (e.g., respirators for asbestos, insulated gloves for MEP work).

- Zero Cost: All required PPE must be provided to workers at no cost, with mandatory enforcement of correct and consistent usage by site supervisors.

4. Training and Competency Program

- Induction Training: Mandatory safety onboarding provided at the beginning of the working relationship or whenever there are material changes to work conditions.
- Toolbox Talks: Operational safety awareness must be reinforced through mandatory monthly toolbox talks at the site level.

5. Medical Surveillance Program

To safeguard long-term worker health, a structured medical surveillance protocol must be enforced by the contractor:

- Pre-placement medical examinations to establish baseline health.
- Periodic medical check-ups tailored to specific workplace exposures (e.g., audiometric testing for noisy environments, lung function tests for dust exposure).
- Exit medical evaluations upon completion of employment.

6. Emergency Response and First Aid

- First Aid: On-site first aid stations must be fully equipped, adequately staffed by trained personnel, and accessible during all working hours.
- Emergency Response: Clearly defined procedures for site evacuation, fire response, and coordination with local emergency services.

7. Incident Reporting, Investigation, and Performance Indicators

- Reporting System: A robust recording and reporting system must be established for all occupational accidents, diseases, and near-misses.
- Bank Notification: The Bank must be notified within three working days of any serious incidents, such as fatalities or injuries requiring hospitalization for more than 24 hours.
- Remedies: Provisions for remedies regarding occupational injuries, disability, or death must be consistent with national laws (Nigerian Labour Act) and international standards, accounting for worker age and dependents.
- Metrics: Contractors must track specific OHS performance indicators and targets (e.g., Lost Time Injury Frequency Rate, Near-Miss resolution rates) to drive continuous improvement.
- Grievance Redress: Workers shall have access to a worker-specific grievance mechanism to raise safety concerns or report hazards without fear of retribution.