Environmental and Social Impact Assessment for PHC Facilities

Lagos State Health Infrastructure Project (LSHIP)

Badagry Axis (Group 7)

By

Lagos State Ministry of Health (LSMoH)

Project Implementation Unit (PIU)

Submitted to

Federal Ministry of Environment (FMEnv)

Abuja, Nigeria

July 2026

This Document Information Matrix

Environmental and Social Impact Assessment for Lagos State Health Infrastructure Project (LSHIP) Group 7 Badagry Axis Group 7

Item	Details
Project Title	Environmental and Social Impact Assessment (ESIA) for Primary Healthcare (PHC) Facilities (Group 7 Badagry Axis Group 7)
Project	Lagos State Health Infrastructure Project (LSHIP)
Volume	Group 7 Badagry Axis Group 7
Project Proponent	Lagos State Ministry of Health (LSMoH), Project Implementation Unit (PIU), Alausa Secretariat, Ikeja, Lagos State
Consultants	Multiple Development Services Ltd. (MDS) supported by Natural Eco Capital
Submitted To	Federal Ministry of Environment (FMEnv), Abuja, Nigeria
Supporting Agencies	Lagos State Environmental Protection Agency (LASEPA)
Financier	African Development Bank (AfDB)
Date	July 2026
Geographic Coverage	Badagry West LCDA and adjoining communities
Facilities Covered	APA, Igbogbele, and Farasime
Regulatory Basis	ESIA Act No. 86 (1992); FMEnv Sectoral Guidelines for Health Facilities; AfDB ISS (2024) OS1–OS10
Prepared For	FMEnv Review, AfDB Safeguards Compliance, LASEPA Environmental Oversight
Confidentiality Note	Not for citation or regulatory approval until final version is issued

AXIS-BASED ESIA NOTE

The Lagos State Health Infrastructure Project (LSHIP) involves upgrading, rehabilitating, and constructing 29 Primary Healthcare (PHC) facilities across Lagos State. To ensure effective environmental and social assessment, the facilities have been clustered into eight (8) geographic axes, each with its own standalone ESIA volume.

This approach allows for:

- Detailed site-specific analysis of environmental and social risks
- Efficient regulatory review by FMEnv and LASEPA
- Clear alignment with AfDB's Integrated Safeguards System (ISS, 2024)
- Improved stakeholder engagement within each axis
- Accurate baseline data collection reflecting local conditions

The Badagry Axis Group 7 (Group 7) comprises three PHC facilities:

- APA PHC
- Igbogbele PHC
- Farasime PHC

While each axis report is independently reviewable, all eight volumes collectively form the full ESIA documentation for the LSHIP. Cross-references are provided where necessary to ensure consistency across axes, particularly for cumulative impacts, medical waste management, climate resilience, and stakeholder engagement. For the Badagry Axis Group 7, cumulative impact considerations are particularly relevant given the coastal and riverine setting along Badagry Creek, ongoing infrastructure expansion along the Lagos–Badagry corridor, and cross-border trade dynamics driving settlement growth and worker–community interactions within the axis.

This axis-based structure ensures that environmental and social risks are assessed at the appropriate geographic scale while maintaining compliance with FMEnv Category I and AfDB Category 1 requirements.

CONSULTANT CERTIFICATION

This ESIA Report for the Lagos State Health Infrastructure Project (LSHIP) Badagry Axis Group 7 (Group 7) 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:

Name: _____

FMEnv Registration No.: _____

Signature: _____

Date: _____

Firm Representative (MDS):

Name: _____Dr. Eugene Itua_____ *Designation:* ___Chief Executive Officer_____ *Signature:* _____



_____ *Date:* __July 2026_____

DISCLAIMER / CAVEAT

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.

ACKNOWLEDGEMENTS

The Lagos State Ministry of Health (LSMoH), through its Project Implementation Unit (PIU), acknowledges the contributions of all institutions, communities, and individuals who supported the preparation of this Environmental and Social Impact Assessment (ESIA) for the Lagos State Health Infrastructure Project (LSHIP) Badagry Axis Group 7 (Group 7).

We express our appreciation to:

Federal Ministry of Environment (FMEnv) Abuja and Lagos Offices For guidance, participation in field verification, and support during the environmental assessment process.

Lagos State Environmental Protection Agency (LASEPA) For technical input, environmental compliance guidance, and coordination with state regulatory systems.

African Development Bank (AfDB) For financing support and safeguard oversight under the Integrated Safeguards System (ISS, 2024).

Local Government Authorities (Badagry LGA) For facilitating community access, stakeholder engagement, and verification of local baseline conditions.

Community stakeholders, including traditional leaders, women's groups, youth associations, PHC staff, and vulnerable groups, provided valuable insights during consultations.

Consultants Multiple Development Services Ltd. (MDS) and Natural Eco Capital for conducting field studies, stakeholder engagement, and preparing the ESIA documentation.

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

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LIST OF ABBREVIATIONS

Abbreviation	Full Meaning
AfDB	African Development Bank
APA	Refers to the APA Primary Healthcare Centre (site-specific)
BHCPF	Basic Health Care Provision Fund
BOD	Biological Oxygen Demand
BSL	Biosafety Level (e.g., BSL-3, BSL-4)
BTOR	Back-to-Office Report
CASHES	Community Affairs, Safety, Health, Environment, and Security
CDA	Community Development Association
CESMP	Contractor's Environmental and Social Management Plan
CIZ	Cumulative Influence Zone
CLO	Community Liaison Officer
CoC	Code of Conduct
E&S	Environmental and Social
ECA	Employee's Compensation Act
EIA	Environmental Impact Assessment
EP4	Equator Principles IV
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
FMEnv	Federal Ministry of Environment
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
GIS	Geographic Information System
GRM	Grievance Redress Mechanism

HEFAMAA	Health Facility Monitoring and Accreditation Agency
HIRA	Hazard Identification and Risk Assessment
HMWMP	Healthcare Waste Management Plan
HRIA	Human Rights Impact Assessment
IDRI	Infectious Diseases Research Institute
IESM	Independent Environmental and Social Monitor
IFC	International Finance Corporation
ILO	International Labour Organization
IPC	Infection Prevention and Control
IRM	Independent Recourse Mechanism
ISS	Integrated Safeguards System (AfDB)
KPI	Key Performance Indicator
LASEPA	Lagos State Environmental Protection Agency
LASWARCO	Lagos State Water Regulatory Commission
LAWMA	Lagos State Waste Management Authority
LCDA	Local Council Development Area
LGA	Local Government Area
LIMP	Labour Influx Management Plan
LTIs	Lost Time Injuries
LRP	Livelihood Restoration Plan
LSHIP	Lagos State Health Infrastructure Project
LSMoH	Lagos State Ministry of Health
LSSC	Lagos State Safety Commission
LULC	Land Use and Land Cover
MDS	Multiple Development Services Ltd.
MEP	Mechanical, Electrical, and Plumbing
NCDC	Nigeria Centre for Disease Control
NDC	Nationally Determined Contribution
NESREA	National Environmental Standards and Regulations Enforcement Agency
NPHCDA	National Primary Health Care Development Agency

NSITF	Nigeria Social Insurance Trust Fund
OHS	Occupational Health and Safety
OS	Operational Safeguard (AfDB)
PAP	Project-Affected Person
PEP	Post-Exposure Prophylaxis
PHC	Primary Healthcare Centre
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PS	Performance Standards (IFC)
RAP	Resettlement Action Plan
RCP	Representative Concentration Pathway
SDG	Sustainable Development Goal
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SH	Sexual Harassment
SWP	Safe Work Procedures
TCFD	Task Force on Climate-related Financial Disclosures
TMP	Traffic Management Plan
TSS	Total Suspended Solids
UN	United Nations
UNGPs	United Nations Guiding Principles on Business and Human Rights
VAPP	Violence Against Persons (Prohibition) Act
VPSHR	Voluntary Principles on Security and Human Rights
WB	World Bank
WHO	World Health Organization

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EXECUTIVE SUMMARY

ES.1 PROJECT BACKGROUND AND PURPOSE

ES.1.1 Project Overview

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) through its Project Implementation Unit (PIU), with financing from the African Development Bank (AfDB). 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.

This Environmental and Social Impact Assessment (ESIA) addresses Group 7 Badagry Axis Group 7, comprising three (3) PHC facilities located in Badagry West LCDA:

PHC Facility	Location	Project Type
APA PHC	Owode-Apa Road, Badagry West LCDA	New Construction (elevated-platform design)
Igbogbele PHC	Badagry West LCDA	Refurbishment
Farasime PHC	Badagry West LCDA (waterfront location)	Refurbishment

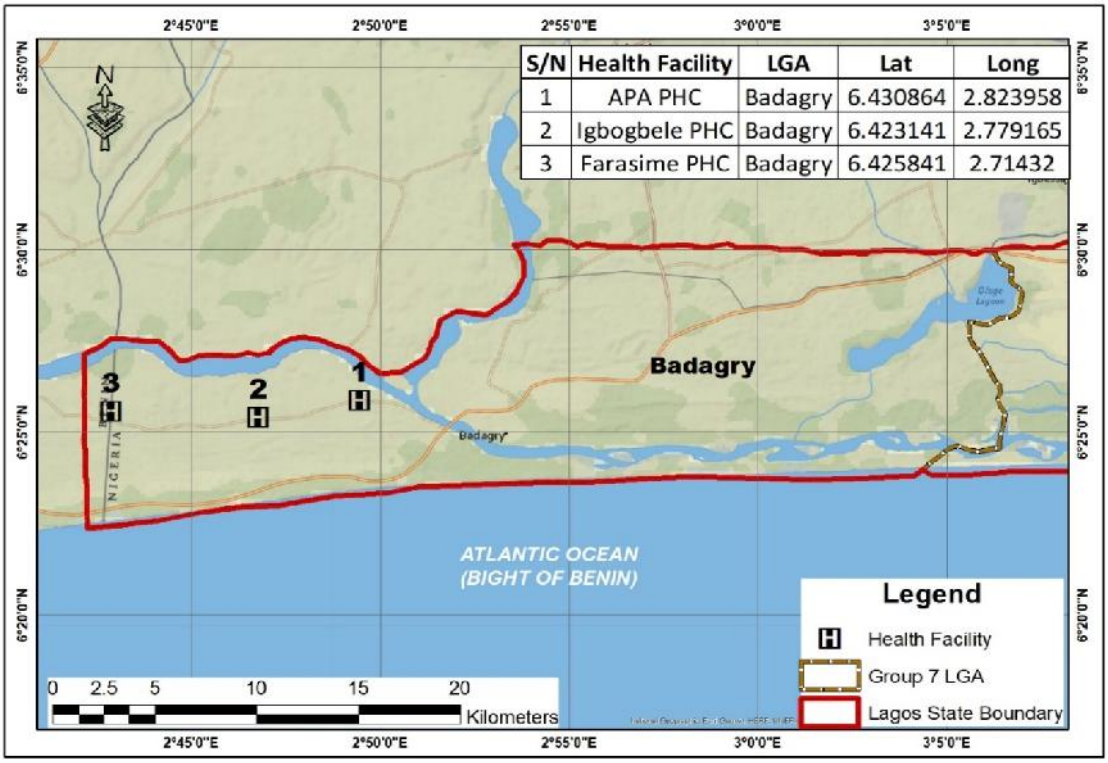


Figure ES1: Group 7 Project Location Map

ES.1.2 Project Rationale

The Badagry Axis Group 7 occupies the coastal lowland and riverine corridor along Badagry Creek, where communities depend principally on fishing and small-scale (including cross-border) trade. Existing facilities are under-resourced: Igbogbele sits in a high-moisture, flood-prone zone with asbestos-suspected roofing; APA and Farasime show aged infrastructure likely containing hazardous materials; and settlement density at APA is increasing rapidly along the Owode-Apa corridor, with notable gaps in security presence and night-time illumination across the catchment. The project directly responds to these deficits by:

- Improving access to quality primary healthcare for low-income, fishing, and trading communities
- Upgrading structural integrity, water supply, sanitation, and waste management systems
- Designing out seasonal flood risk (elevated platform at APA; drainage upgrades at all sites)
- Ensuring continuity of essential health services during and after construction
- Strengthening climate resilience through green building design and solar power systems

ES.1.3 Project Classification

The 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, presence of hazardous materials (asbestos-suspected structures), proximity to sensitive riverine and creek ecosystems, and the scale of construction activities in economically vulnerable coastal 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
- Identifies and assesses all potential environmental and social impacts
- Develops clear, actionable, site-specific mitigation measures
- Prepares safeguard instruments including the ESMP, HMWMP, GBV/SEA/SH Action Plan, and Asbestos Management Plan
- Demonstrates full compliance with the AfDB ISS, FMEnv EIA Act, and international good practice
- 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 7 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—APA (new construction on an elevated platform), Igbogbele (refurbishment), and Farasime (refurbishment)—are small rural Primary Healthcare Centres with modest service footprints and basic infrastructure.

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 PHCs undergoing new construction or refurbishment.

This ESIA has been prepared in accordance with AfDB's Integrated Safeguards System and is consistent with internationally recognised environmental assessment practices, including methodologies commonly applied by the U.S. Environmental Protection Agency (EPA), ensuring that the analysis and documentation meet globally accepted technical standards.

ES.2 PROJECT DESCRIPTION

ES.2.1 Project Components

Component	Description
New Construction	One (1) new PHC at APA on the existing PHC land parcel, with an elevated-platform design to prevent seasonal flooding
Refurbishment	Two (2) existing PHCs (Igbogbele, Farasime) refurbished and expanded, including structural rehabilitation and retrofitting
Infrastructure	Solar power systems, boreholes, septic tanks, small-scale non-burn medical waste treatment facilities, digital health infrastructure
Access Improvements	Upgraded access roads and drainage within PHC premises

ES.2.2 Design Features

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

- Elevated platform at APA to design out seasonal flood risk
- Solar power systems with battery storage (24–48 hours backup)
- Rainwater harvesting integrated with borehole supply (programme standard)
- Cool roofs and natural ventilation
- 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	asbestos surveys, design, permitting, contractor procurement
Construction	12–18 months per facility (staggered schedule)	Earthworks and elevated platform (APA), building and retrofit works, MEP installation, equipment installation

Operation	50+ years	Routine outpatient, maternal/child health, immunization, basic laboratory services

ES.2.4 Project Resources

Resource	Estimated Quantity	Sourcing
Labour (peak)	85–105 workers (staggered per facility)	≥50% local hiring (within Badagry LGA/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
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 (asbestos, chemicals)
- Land Use Act Cap L5 LFN 2004 – Governs land acquisition and compensation
- 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, 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
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 (Owode-Apa corridor), EPRP
OS5 – Land Acquisition and Involuntary Resettlement	Compensation, livelihood restoration	None of the potential sites' activities has the potential to induce physical or economic displacement.
OS6 – Biodiversity and Ecosystem Services	Sensitive ecosystem screening, buffers	Riverine/creek buffers, sediment controls, shoreline protection
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.4.1 Physical Environment

Parameter	Description
Location	Badagry Axis – flat, sandy coastal lowlands and riverine corridor draining to Badagry Creek

Climate	Humid tropical coastal climate; marine-influenced; bimodal rainfall (1,500–1,800 mm/year); 26–35°C
Air Quality	PM_{10}: 1.2–168.8 µg/m³; $PM_{2.5}$: 4.1–116.7 µg/m³ – localized exceedance at Igbogbele SP1; APA and Farasime within 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 APA
Geology	Coastal plain sands with clay intercalations; riverine/alluvial deposits; high-water table
Erosion Risk	High at APA (coastal erosion); medium at Igbogbele (sandy soils)
Flood Risk	High at Igbogbele (flood-prone zone); high at Farasime (axis flood high-risk site); elevated-platform design at APA
Coastal Erosion/SLR	APA (Badagry West) identified among coastal-erosion/sea-level-rise high-risk sites

ES.4.2 Biological Environment

Aspect	**Findings**
Setting	Riverine and creek-margin ecosystems along Badagry Creek; coastal vegetation
Sensitive Ecosystems	Badagry Creek and riverine fringes – receptors for any waste or sediment discharge
Ecosystem Services	Fisheries (primary livelihood), creek transport, groundwater (water supply), flood attenuation
Safeguards Applied	Riverine/creek buffers, sediment and spill controls, shoreline protection at the waterfront site (Farasime)

ES.4.3 Socio-economic Environment

Aspect	Findings
Population	Approximately 42,500–48,000 residents across catchment areas (~14,000–16,000 per facility)
Livelihoods	Fishing and small-scale (including cross-border) trade; boat operation; fish processing; farming

Land Tenure	Government-owned (APA, Farasime); community interface (Igbogbele)

Vulnerable Groups	Fisher households, women-headed households, elderly, persons with disabilities, economically vulnerable residents, trans-border worker populations
GBV Risk	Medium–High at APA and Farasime; Medium at Igbogbele (labour influx, poor lighting, lack of confidential reporting, economic vulnerability, border dynamics)
Cultural Heritage	No heritage sites within 100 m; chance finds possible during excavation; Zangbeto spots and sacred grounds near Igbogbele

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

Parameter	High-Risk Exposure (Group 7)	Projected Change
Flooding (pluvial/fluvial)	Farasime (axis flood high-risk site); Igbogbele (flood-prone zone)	+30% rainfall intensity; 1:100-year storm becomes ~1:30-year
Coastal erosion / sea-level rise	APA (Badagry West)	Sea-level rise 0.2–0.5 m; increased storm surge
Heatwaves	All sites	+2–3 C; days >40 C increase from ~10/year to ~60/year
Extreme rainfall / storms	All sites	+20–30% intensity

ES.5 KEY ENVIRONMENTAL AND SOCIAL IMPACTS

ES.5.1 Summary of Unmitigated Impacts

Significance	Impact	Site(s)	Phase
CRITICAL	Asbestos fibre release during demolition of aged structures	Igbogbele (suspected roofing); APA, Farasime (aged structures)	Pre-construction / Construction
CRITICAL	Discharge of medical and construction waste into Badagry Creek	All sites (creek corridor)	Construction / Operation

CRITICAL	GBV/SEA/SH risks heightened by labour influx and economic vulnerability	All sites	Construction
CRITICAL	Flooding of construction areas and facilities	Igbogbele, Farasime; APA (pre-mitigation)	Construction / Operation
MAJOR	Occupational health and safety risks	All sites	Construction
MAJOR	Traffic and access disruption along the Owode-Apa corridor	APA	Construction
MAJOR	Water quality and erosion risks	Creek-adjoining sites	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)
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 resilience for remote riverine communities

ES.6 ANALYSIS OF ALTERNATIVES

Alternative	Assessment	Conclusion
No-Project Alternative	Continued infrastructure decay, flood exposure, and poor access for riverine communities	Rejected – unacceptable
Alternative Sites	Existing PHC land parcel at APA avoids acquisition and displacement	Preferred – existing PHC land
Conventional (at-grade) Design at APA	Recurrent seasonal flood damage and service interruption	Rejected
Elevated-Platform / Green Building Design	Designs out flood risk; lower operating costs; climate resilience	Preferred
Diesel Generators	High operating cost, air pollution, GHG emissions	Rejected
Solar Power + Battery	Low operating cost, reduced emissions, resilient power	Preferred
Open Burning of Waste	Air pollution, community health risk, illegal	Rejected
Non-burn HMWMP (AfDB-compliant)	Colour-coded segregation, non-burn treatment, licensed LAWMA disposal; protects the creek	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 (<=0.1 f/ml)	Specialist Contractor
Creek pollution	Non-burn waste treatment; sediment and spill prevention; no discharge to Badagry Creek	Contractor / Facility Operator
Flooding	Elevated platform at APA; oversized drainage; elevated electricals	Contractor / PIU
GBV/SEA/SH	Zero-tolerance Code of Conduct, training, confidential survivor-centred reporting, referral pathways	Contractor / PIU / GBV Specialist
Labour influx	Labour Influx Plan; ≥50% local hiring; worker conduct rules	Contractor

Traffic safety	Traffic Management Plan on the Owode-Apa corridor: marshals, speed limits, signage	Contractor
Erosion / water quality	Silt fences, sediment traps, bunded fuel storage, spill kits	Contractor
Medical waste	Colour-coded segregation, non-burn treatment, 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 ug/m3
Asbestos	Airborne fibres	Continuous during abatement	>0.1 f/ml
Noise	Leq dB(A)	Weekly	>55 dB(A) residential daytime
Water Quality (creek)	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 liaison; monthly reports to PIU
Facility Operator	Operational ESMP, HMWMP, IPC, wastewater management
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 totals ₦506,000,000 (US$337,333) for the construction phase and ₦39,000,000–₦52,000,000 (US$26,000–US$34,667) annually for the operational phase, covering all environmental, social, monitoring, compliance, climate-resilience, and grievance-redress measures required for the three Group 7 PHCs (APA, Igbogbele, and Farasime). This includes site-specific mitigation actions, environmental monitoring, asbestos management across all three sites, climate-resilient design features, labour-influx and GBV/SEA/SH controls, stakeholder engagement, and full implementation of the GRM across the axis as shown in Table 7.2A. Full implementation of the GRM across APA, Igbogbele, and Farasime is shown below:

Site	**Construction Phase (₦)**	**Construction Phase (US$)**	**Annual Operational (₦)**	**Annual Operational (US$)**
APA PHC	174,570,000	116,380	15,000,000 – 20,000,000	10,000 – 13,333
Igbogbele PHC	169,510,000	113,007	12,000,000 – 16,000,000	8,000 – 10,667
Farasime 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 Badagry Creek.

ES.8.2 Asbestos Management

- Asbestos-roofing at Igbogbele; aged infrastructure likely containing hazardous materials at Farasime.
- Licensed surveyor to confirm presence/absence and extent
- Licensed abatement contractor: wet removal, HEPA controls, continuous air monitoring
- Clearance monitoring: <=0.01 f/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
APA	Labour influx (new construction), poor lighting, lack of confidential reporting, economic vulnerability, flood-displacement pressures, limited police response, restrictive cultural norms	Medium–High
Farasime	Waterfront/fisher-community vulnerability, poor lighting, limited reporting channels	Medium–High
Igbogbele	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 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 (24–27 February 2026)

Activity	**Description**	**Sites Covered**

Community entry meetings	Introductory meetings with traditional and community leaders	All sites
Focus Group Discussions	Women, youth, fishers, traders	All sites
Key Informant Interviews	Traditional leaders, PHC staff, LGA officials	All sites
Site walkthroughs	Environmental and social assessment of each facility	All sites
GBV/SEA/SH screening	Risk identification and reporting-channel assessment	All sites

ES.10.2 Key Concerns Raised by Stakeholders

Concern	Response
Flooding and drainage	Elevated platform at APA; oversized drainage; elevated electricals
Protection of fishing and trading livelihoods	Creek protections, access maintenance, livelihood safeguards, RAP entitlements
Employment for locals	≥50% local hiring target; local procurement
Safe handling of asbestos and medical waste	Licensed abatement with air monitoring; non-burn HMWMP with LAWMA disposal
Security and lighting	Solar lighting, perimeter fencing, security coordination
Confidential GBV reporting	Survivor-centred confidential channels; female focal points; anonymous options

ES.10.3 Grievance Redress Mechanism (GRM)

Feature	Description
Entry Points	Hotline, suggestion boxes, CLOs, female GRM focal points, anonymous reporting
Acknowledgement	Within 48 hours
Resolution	Within 14 days
Tiered System	PHC/community level – LGA liaison – PIU – FMEnv/AfDB
GBV Cases	Confidential handling; survivor-centred approach
Reporting	PIU monthly to AfDB

ES.11 DISCLOSURE AND REPORTING

ES.11.1 Disclosure Requirements

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	Monthly	Contractor – PIU
E&S Performance Report	Quarterly	PIU – AfDB
ESMP Compliance Report	Quarterly	Facility Operator – PIU
Independent Audit Report	Quarterly	IESM – AfDB
Incident Report	Within 24 hours	Contractor – PIU

ES.12 CONCLUSION AND RECOMMENDATIONS

ES.12.1 Overall Conclusion

The ESIA concludes that the development of APA, Igbogbele, and Farasime PHCs is environmentally and socially viable. All adverse impacts – environmental, social, health, safety, and GBV-related can be avoided, minimized, or mitigated to acceptable levels through full implementation of the ESMP, HMWMP, GBV/SEA/SH Action Plan, Asbestos Management Plan, and associated safeguard instruments. The project will deliver substantial positive impacts, including:

- Expanded access to quality healthcare for approximately 150,000 residents of the Badagry Creek corridor
- Reduced maternal and child mortality (programme estimate: 20–35%)
- Flood-resilient facilities, led by the elevated-platform design at APA
- Local employment and procurement prioritising fishing and trading communities
- Transition to solar energy with reduced GHG emissions
- Strengthened pandemic resilience for remote riverine communities and improved gender safety systems

The project aligns with the AfDB ISS, 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:

- Conduct asbestos surveys at all three sites (Igbogbele roofing flagged; aged structures at Farasime); implement licensed abatement where confirmed
- Establish GBV referral pathways and recruit the GBV Specialist; activate confidential reporting channels

- Implement flood-resilient design (elevated platform at APA; oversized drainage; elevated electricals)
- Obtain all regulatory permits (LASEPA, LAWMA, building approvals)
- Demarcate creek/riverine buffers and finalise sediment-control designs
- Train contractors and PIU staff on the AfDB ISS and ESMP implementation

Construction Phase Recommendations:

- Enforce the CESMP: dust control, noise limits (restricted hours near clinical services), erosion control, spill prevention
- Implement the GBV Action Plan: CoC, training, reporting, sanctions
- Ensure ≥50% local hiring to reduce labour-influx pressure
- Conduct environmental monitoring (air, noise, creek water quality, waste)
- Maintain the GRM: 48-hour acknowledgement, 14-day resolution
- Implement the Traffic Management Plan on the Owode-Apa corridor (APA)
- Conduct quarterly IESM audits and implement corrective actions

Operational Phase Recommendations:

- Implement the HMWMP: segregation, non-burn treatment, LAWMA disposal, and no discharge to Badagry Creek
- Apply WHO IPC standards: hand hygiene, sterilization, PPE, cleaning
- Maintain climate-resilient features: solar power, drainage, elevated platform integrity
- Continue GBV prevention and response: staff training, confidential reporting
- Maintain the GRM for patients and community members
- Desludge septic tanks every 2–3 years
- Prioritise solar power to reduce GHG emissions

ES.12.3 Final Statement

The Lagos State Health Infrastructure Project (LSHIP) Badagry Axis Group 7 will significantly improve public health outcomes, strengthen health system resilience, and enhance environmental sustainability along the Badagry Creek corridor. With robust mitigation measures, strong institutional oversight, and continuous 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:

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

CHAPTER 1 – INTRODUCTION

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, 2023), 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.

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

Lagos State operates a three-tier healthcare system comprising (Lagos State Ministry of Health, 2023):

- 5 tertiary facilities (state and federal)
- 28 public secondary hospitals
- 339 public PHCs, of which approximately 220 are non-functional
- Over 2,333 private hospitals, providing 60-70% of healthcare services (Health Facility Monitoring and Accreditation Agency, 2024)

Despite this extensive network, health financing remains inadequate. In 2024, Lagos allocated 6.75% of its total budget to health – below the 15% Abuja Declaration benchmark (Lagos State Ministry of

Economic Planning and Budget, 2024). The LSHIP directly responds to these deficits. It aligns with the National Health Strategic Development Plan (Federal Ministry of Health, 2018), the Lagos State Development Plan 2052 (Lagos State Government, 2022), and Nigeria's Nationally Determined Contributions (NDCs) under the Paris Agreement (Federal Ministry of Environment, 2021).

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, ement 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:

To support spatial understanding and ESIA planning, the clusters are presented in Table 1.2.

Table 1.2: Geographical Clusters for the 29 LSHIP Project Sites

Cluster	Description	LGAs / LCDAs Covered	General Characteristics
Group 1	Western Mainland Hub	Amuwo Odofin (Oriade), Ajeromi Ifelodun (Ifelodun), Alimosho (Ayobo Ipaja, Egbe Idimu)	Mix of construction and refurbishment in high-density residential and commercial mainland districts.
Group 2	Central Business/Mainland Hub	Oshodi-Isolo (Isolo), Lagos Mainland (Yaba), Ikeja (Ojodu)	Strategic urban centers focused on administrative and transit hubs; includes both refurbishment and new construction.

Group 3	Badagry North Corridor	Badagry (Badagry North, Badagry LGA)	Concentrated development in the northern peri-urban expansion zones of Badagry.
Group 4	Badagry Coastal/Hinterland	Badagry (Imota, Igbogbo Bayeiku, Ijede, Badagry West)	Extension into the industrial and coastal LCDAs of the Badagry division.
Group 5	Epe/Lekki Eastern Axis	Epe (Ikosi Ejirin), Ibeju Lekki (Ibeju Lekki LCDA)	Rural-urban transition zones characterized by rapid infrastructure development and coastal proximity.
Group 6	Ibeju-Lekki Coastal Hub	Ibeju Lekki (Ibeju Lekki LCDA, Lekki LCDA)	Focused primarily on refurbishment within the high-growth coastal Lekki LCDA corridor.
Group 7	Badagry West Axis	Badagry (Badagry West LCDA)	Riverine and border-corridor sites including APA, Igbogbele, and Farasime.
Group 8	Regional Outliers	Badagry (Olorunda, Badagry LGA), Kosofe (Agboyi Ketu)	Diverse locations covering the Badagry hinterland and the Agboyi Ketu marshlands.



Figure 1.1 – Map of Nigeria Showing Lagos State

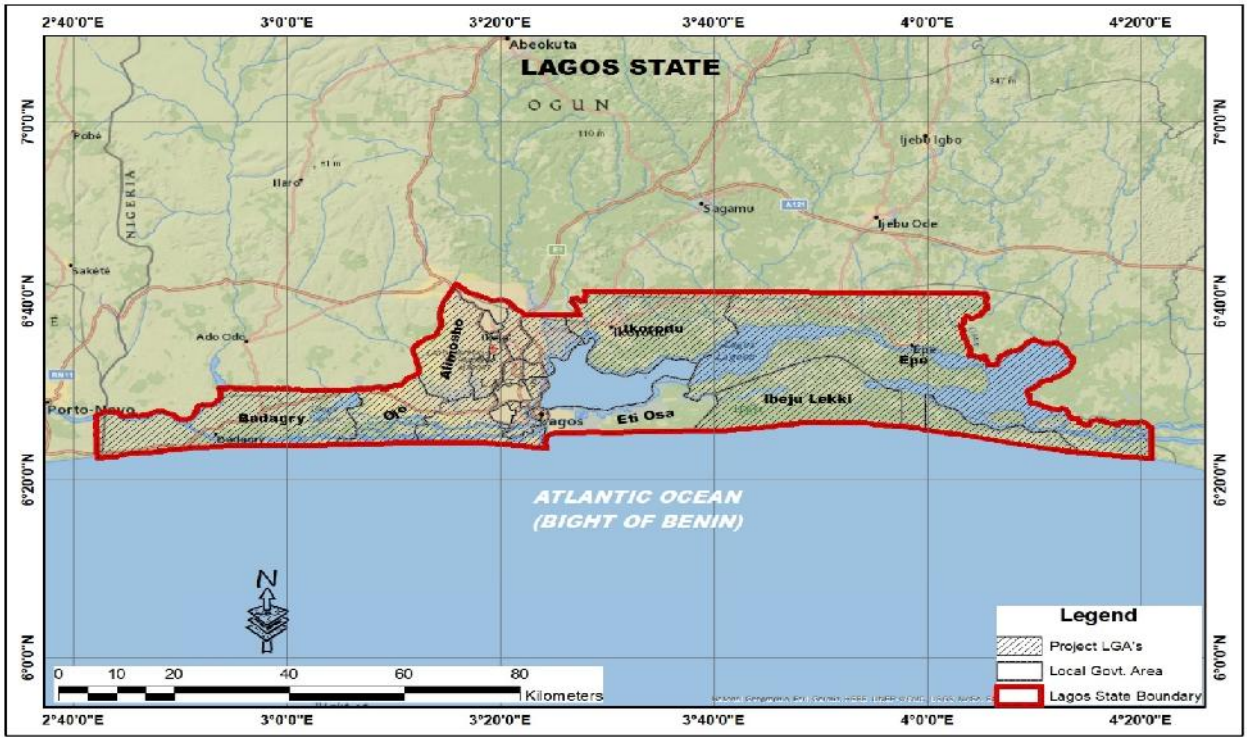


Figure 1.2 – Map of Lagos State showing the 20 LGAs and 29 Project Sites

Figure 1.3 provides a spatial overview of all project site locations, including their latitude and longitude coordinates and corresponding cluster assignments.

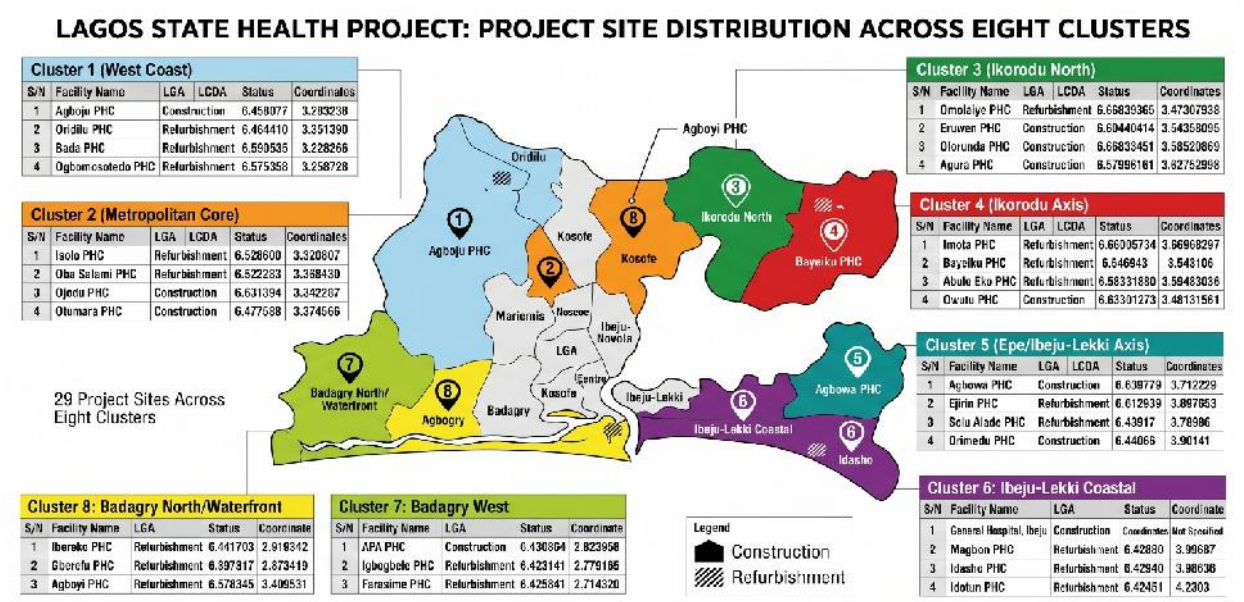


Figure 1.3: Spatial Overview of Project Sites Locations with Coordinates

1.2.2 Ecological Zones

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

The following ecological sensitivities are directly relevant to the project (Multiple Development Services, 2026; African Development Bank, 2025):

- Wetland areas: Agbowa, Oke Ogbe, Eruwen, Omolaiye (waterlogged/sensitive ecosystem)
- Mangrove proximity: Orimedu, Idotun, Gberefu, APA Badagry West
- Riparian corridors: Oridilu (Amukoko), Baiyeku (waterfront), Abule Eko (lakeside), Ejirin (riverside)

1.2.3 Project Typology Overview

In addition to the broader cluster distribution under the Lagos State Health Improvement Programme (LSHIP), the PHC facilities in Badagry Axis Group 7, comprising APA, Igbogbele, and Farasime, reflect

a mix of intervention typologies based on the feasibility assessments and stakeholder consultations. Across these facilities, the proposed works include new construction and/or refurbishment interventions, depending on the current condition, service gaps, and infrastructure requirements identified during project preparation. This typology reflects the differing degrees of physical improvement and structural intervention required to bring the facilities up to the standards envisioned under the LSHIP programme.

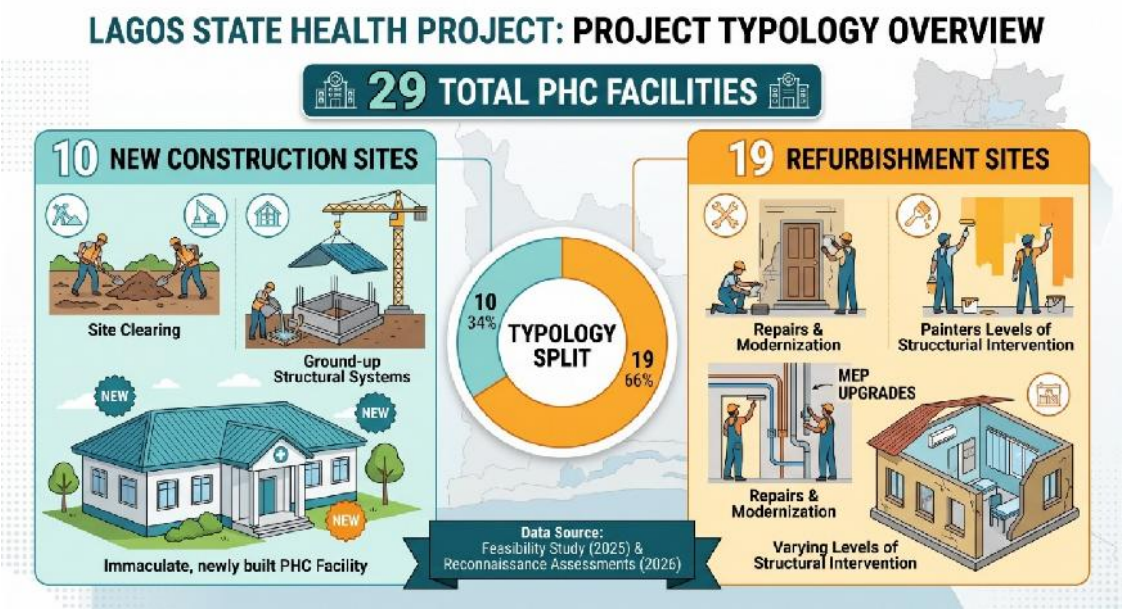


Figure 1.4: Project Typology Overview

1.2.4 Need for ESIA Across APA, Igbogbele, and Farasime PHC Facilities

Although the PHC sites at APA, Igbogbele, and Farasime differ in physical setting, surrounding land use, and scale of intervention, the programme requires full Environmental and Social Impact Assessment (ESIA) coverage due to the environmental and social risks identified during screening. The need for ESIA across these facilities is driven by the following factors:

a) Multi-site programme footprint

The project covers multiple PHC sites within the Badagry Axis Group 7, each situated in distinct community and environmental contexts. Even within the same axis, differences in settlement density, ecological characteristics, and access conditions require a coordinated ESIA approach to ensure consistent risk identification and mitigation across all project locations.

b) Construction activities with environmental and social risks Where the intervention involves new construction, project activities may include site clearing, excavation, foundation works, structural development, roofing, and mechanical, electrical, and plumbing installations. These activities may generate impacts on soil stability, drainage, air quality, ambient noise levels, vegetation,

occupational health and safety, and community safety, thereby triggering the need for environmental and social assessment.

c) Refurbishment activities also present significant E&S concerns Where existing PHC structures are to be upgraded, rehabilitation works may involve:

- removal of deteriorated building components,
- structural repairs,
- electrical and mechanical system upgrades,
- replacement of roofing, ceilings, windows, and finishes,
- temporary disruption or relocation of service areas,
- management of demolition and construction waste.

Such activities may result in occupational hazards, waste generation, nuisance impacts, and temporary service disruption, all of which justify ESIA coverage.

d) Risk of land-related impacts and livelihood disturbance Depending on final design requirements, some facilities may require space optimisation, boundary adjustments, or clearing of encroachments within or around the PHC premises. Where this affects informal users, nearby economic activity, or access to land and community resources, it may trigger social safeguard requirements relating to land acquisition, access restriction, or economic displacement. ESIA is therefore necessary to identify such risks early and define appropriate mitigation and compensation measures where required.

e) Environmentally sensitive coastal and low-lying settings The Badagry Axis Group 7 includes communities that may be associated with coastal, wetland, flood-prone, waterlogged, or low-lying ecological conditions. Facilities such as APA, Igbogbele, and Farasime may therefore be exposed to environmental sensitivities relating to drainage limitations, erosion vulnerability, seasonal flooding, and ecosystem disturbance. These conditions require site-specific environmental assessment and suitable design and mitigation measures.

f) Public health facilities are inherently sensitive infrastructure Primary healthcare facilities generate a range of environmentally and socially sensitive wastes and operational risks, including medical waste, wastewater, sharps, infectious materials, pharmaceutical residues, and sanitation-related discharges. Because of the public health implications of such facilities, they are regarded as sensitive infrastructure requiring robust environmental and social assessment irrespective of project scale.

g) Need for a unified Environmental and Social Management Plan (ESMP) A consolidated ESMP is required for the facilities in APA, Igbogbele, and Farasime in order to:

- Standardise mitigation measures across the sites,
- Harmonise contractor environmental and social obligations,
- Ensure compliance with applicable state and federal requirements,
- Support monitoring by relevant regulatory and implementing authorities, and
- Provide a coordinated framework for impact management throughout construction and operation.

This is best achieved when all facilities are subjected to ESIA screening, assessment, and categorisation under a common safeguard framework.

Together, these factors justify the preparation of a full ESIA for the PHC facilities in Badagry Axis Group 7 (APA, Igbogbele, and Farasime), ensuring compliance with applicable environmental and social safeguard requirements, relevant national regulations, and Lagos State environmental standards under the LSHIP programme.

1.3 Project Delivery & Key Entities

The Badagry Axis Group 7 PHC facilities, comprising APA, Igbogbele, and Farasime, are delivered through a coordinated, multi-institutional structure designed to ensure effective planning, safeguard compliance, and high-quality implementation. The project involves several key entities, each with defined responsibilities under the AfDB Integrated Safeguards System (ISS, 2023/2024), FMEnv EIA Act CAP E12 LFN 2004, and relevant Lagos State regulatory frameworks.

1.3.1 Badagry Axis Group 7 PHC Project – Project Owner

The Badagry Axis Group 7 PHC Project is part of the Lagos State Health Project programme aimed at modernising primary healthcare delivery, improving service quality, and strengthening health system resilience within the Badagry Axis Group 7 of Lagos State. The project covers the PHC facilities at APA, Igbogbele, and Farasime, involving new construction and/or refurbishment interventions, depending on site-specific needs and conditions.

The project owner is responsible for:

- overall project ownership and strategic direction,
- provision of land and enabling infrastructure where required,
- coordination with local government authorities and community stakeholders,
- ensuring compliance with state and federal regulations,
- facilitating RAP implementation where required,

- oversight of contractors and service providers.

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

Here is the refined text. The outdated Operational Safeguard (OS) numbers and titles have been updated to accurately reflect the 2023 African Development Bank (AfDB) Integrated Safeguards System (ISS) nomenclature, successfully addressing the reviewer's comments.

The African Development Bank (AfDB) is the primary financier of the Badagry Axis Group 7 PHC interventions 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.

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 7 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.

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 1.5 presents the institutional framework for the Badagry Axis Group 7 PHC facilities, illustrating the relationships among the key entities responsible for financing, regulation, implementation, monitoring, and community engagement.

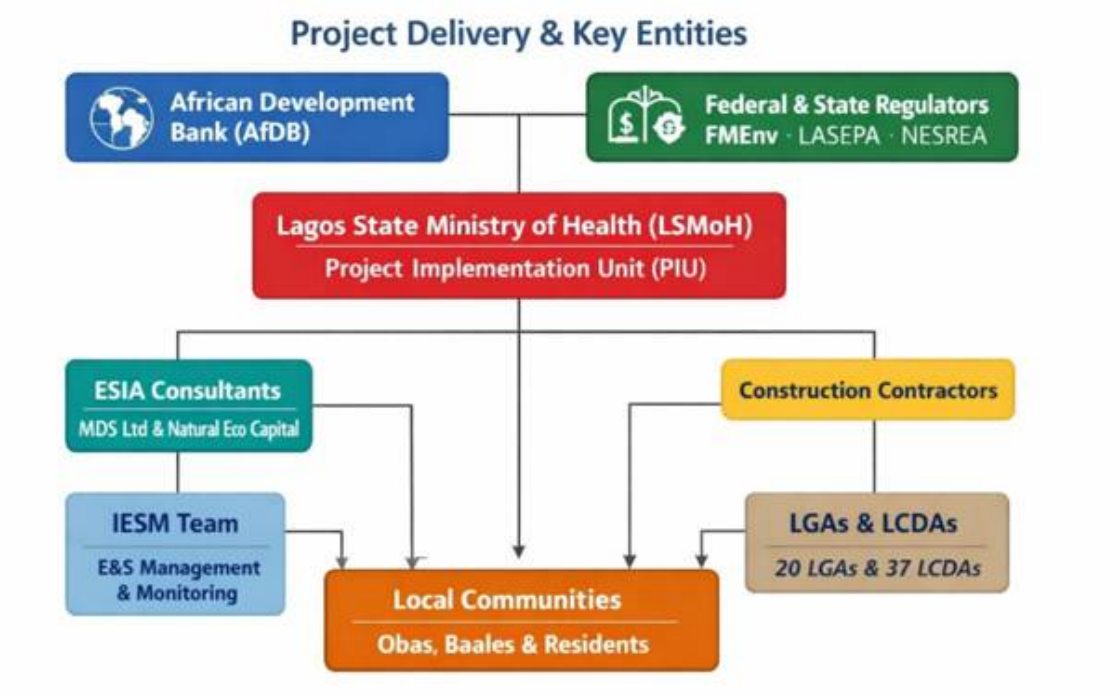


Figure 1.5: Institutional Framework Organogram

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:

1. 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).

2. Lender Requirement (AfDB): The December 2025 Identification Mission confirmed Category 1 (High Risk) due to involuntary resettlement (6 sites, >200 persons), environmentally sensitive locations (wetlands, waterlogged areas), presence of hazardous materials (asbestos at 9 sites), community health and safety risks, and capacity gaps within the PIU (African Development Bank, 2025).
3. International Good Practice: While IFC Performance Standards and Equator Principles IV provide useful guidance, the primary framework for this project is the AfDB ISS 2023 (Operational Safeguards OS1-OS10). The project also aligns with IFC Performance Standards (PS1-PS8), Equator Principles IV, WHO healthcare waste guidelines, and ILO labour standards as complementary good practice.

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. **Identify and Assess Potential Impacts:** Systematically evaluate the environmental and social consequences of project activities across the three (3) designated PHC facilities within the Badagry Axis Group 7 (as part of the overarching 29-site LSHIP programme), addressing potential issues such as wetland loss or habitat disruption in riverine areas.
2. **Establish a Site-Specific Baseline:** Characterize the existing environmental conditions, including hazardous material presence (like asbestos in Farasime) and socio-economic vulnerabilities (such as economic fragility in Igbogbele).
3. **Develop Mitigation and Enhancement Measures:** Formulate technical and social instruments to prevent, minimize, or compensate for adverse impacts while maximizing project benefits like green energy transition and improved health equity.
4. **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.

5. **Facilitate Stakeholder Engagement:** Provide a framework for continuous dialogue with the diverse communities across the cluster, ensuring their concerns are integrated into the project design and a Grievance Redress Mechanism (GRM) is established.
6. **Formulate an Environmental and Social Management Plan (ESMP):** Create a clear roadmap for the implementation of safeguards, defining responsibilities and budgets for mitigation actions during the pre-construction, construction, and operational phases.
7. **Manage Specific Hazardous Risks:** Develop targeted protocols for high-risk activities, particularly the safe abatement and disposal of asbestos identified in older facility structures.
8. **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).
9. **Prepare Safeguard Instruments:** Develop site-specific Environmental and Social Management Plans (ESMPs), Hazardous and Medical Waste Management Plans (HMWMPs), and GBV Action Plans for the facilities.
10. **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.

The scope includes the following key areas:

1. Geographical and Physical Scope

- 29 Project Sites: The assessment covers all 29 facilities identified in the project documentation, ranging from urban hubs in Ikeja and Lagos Mainland to remote riverine sites in Badagry.
- Cumulative Influence Zone (CIZ): Evaluation of the spatial and temporal reach of combined stressors, specifically where LSHIP activities overlap with other regional infrastructure projects.

- Infrastructure Types: The scope includes both the refurbishment of existing aged facilities and the new construction of modern clinical blocks.

2. Environmental and Technical Scope

- Baseline Characterization: Establishing the current state of air quality, noise levels, soil composition, and hydrology across the diverse clusters.
- Hazardous Material Management: Specific focus on the identification and safe abatement of asbestos, particularly in older structures such as APA and Farasime.
- Climate and Energy: Assessment of the transition to renewable energy through solar-hybrid installations and the project's resilience to local climate risks like flooding.
- Waste Management: Evaluation of construction debris disposal and long-term medical waste logistics.

3. Social and Institutional Scope

- Social Safeguards: Identifying risks related to Labour Influx, with a specialized focus on preventing Gender-Based Violence (GBV) and Sexual Exploitation, Abuse, and Harassment (SEA/SH).
- Stakeholder Engagement: Mapping and consulting with diverse local communities, traditional leaders, and health workers to ensure local ownership.
- Institutional Capacity: Assessing the ability of implementing agencies to manage safeguards and identifying requirements for institutional strengthening.
- Grievance Redress: Establishing a formal Mechanism (GRM) to handle project-related complaints across all 29 sites.

4. Regulatory Framework Scope

- National Compliance: Adherence to the Nigeria Climate Change Act 2021 and Lagos State environmental laws.
- International Standards: The assessment triggers and follows the AfDB Operational Safeguards (OS1–OS10) and the IFC Performance Standards (PS1–PS8).

A structured overview of the facilities by LGA/LCDA, distinguishing between new construction and refurbishment sites for ease of reference and management is given

PHC, APA Badagry West	Apa Community, Badagry West	APA is a coastal rural community with fishing and farming as primary livelihoods. The population is dispersed, and access to higher-	https://maps.app.goo.gl/u

Construction		level health facilities is limited, making PHCs essential for primary care. The environment is characterised by swampy terrain, coastal flooding, and limited road access.	Mi4cfYrJzjP5YHo8
PHC, Igbogbele **Refurbishment**	Igbogbele Owode Apa Rd, Egbe Idimu LCDA Coordinates 6.6447° N, 3.3417° E	Igbogbele is a semi-rural community along the Owode–Apa corridor, characterized by expanding residential clusters, small-scale farming, limited road infrastructure, and growing demand for reliable primary healthcare services.	https://maps.app.goo.gl/PRFyGydVp4zJ1cDo8
PHC, Farasime **Refurbishment**	Farasime Community Badagry West Coordinates: 6.440° N, 2.934° E	Farasime is a predominantly rural riverine community in Badagry West, marked by dispersed settlements, fishing and farming livelihoods, limited transport access, and strong reliance on nearby primary health facilities for essential services.	https://maps.app.goo.gl/cd9Qf69YxxRiasbJ7

The scope of the Environmental and Social Impact Assessment (ESIA) for the 29 Primary Health Centres (PHCs) is defined by the project lifecycle and the specific environmental and social pillars critical to the Lagos State Health Infrastructure Project (LSHIP).

1. Temporal Scope

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

- Pre-Construction Phase: This phase involves site reconnaissance, establishing environmental baselines, and identifying hazardous materials such as asbestos in older structures.
- Construction Phase: This encompasses active physical works, including new construction at 10 sites and refurbishment at 19 sites. Key activities include structural retrofitting, site clearing, and the installation of digital and green infrastructure.
- Operational Phase: The scope extends to the long-term management of the facilities, focusing on medical waste logistics, the maintenance of solar-hybrid power systems, and the ongoing use of the digital health platform.

2. 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 flood resilience in vulnerable nodes like Group 7 in Badagry Axis Group 7.
- Hazardous Materials & Waste: A priority focus on the safe abatement of asbestos during the refurbishment of older PHCs and the institutionalisation of modern medical waste management.
- Social Safeguards: Management of risks associated with labour influx, 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 and enhanced site lighting.
- Digital Health Integration: Scaling the digital infrastructure to improve healthcare delivery and patient data management across all 29 locations.

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 African Development Bank (AfDB) Integrated Safeguards System (ISS), and they determine the level of assessment required for each facility. A summary of the specific triggers relevant to the Badagry Axis Group 7, highlighting the regulatory basis and the implications for the project:

Trigger	Regulation	Relevance to each PHC
Environmental Assessment	EIA Act Cap E12 LFN 2004	Mandatory for all 29 sites to assess impacts of new construction (10 sites) and refurbishments (19 sites) on the local ecosystem.
Hazardous Waste	Harmful Waste Act Cap H1 LFN 2004	Applicable to sites requiring refurbishment (such as Farasime) to manage the removal of asbestos and hazardous materials.
Climate Resilience	Nigeria Climate Change Act 2021	Relevant to all sites as they transition to solar-hybrid power and implement climate-smart infrastructure.

Waste Management	Lagos State Environmental Law (2017)	Governs the disposal of medical waste and construction debris across all clusters to prevent environmental contamination.
Social Safeguards	AfDB Operational Safeguards (OS1–OS10)	Triggers mandatory assessments for labour influx, GBV, and community health across the 8 geographical groups.
Labor Standards	Labour Act Cap L1 LFN 2004	Applicable to the management of site workers, ensuring fair wages and safety during the construction phase of all 29 facilities.
International Benchmarking	IFC Performance Standards (PS1–PS8)	Sets the global standard for managing environmental and social risks, including resource efficiency and land acquisition.

These triggers collectively justify the project's classification as Category 1 (AfDB) and Category I (FMEnv), thereby requiring a full ESIA.

1.5.2 ESIA Process Flow

Figure 1.6 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.

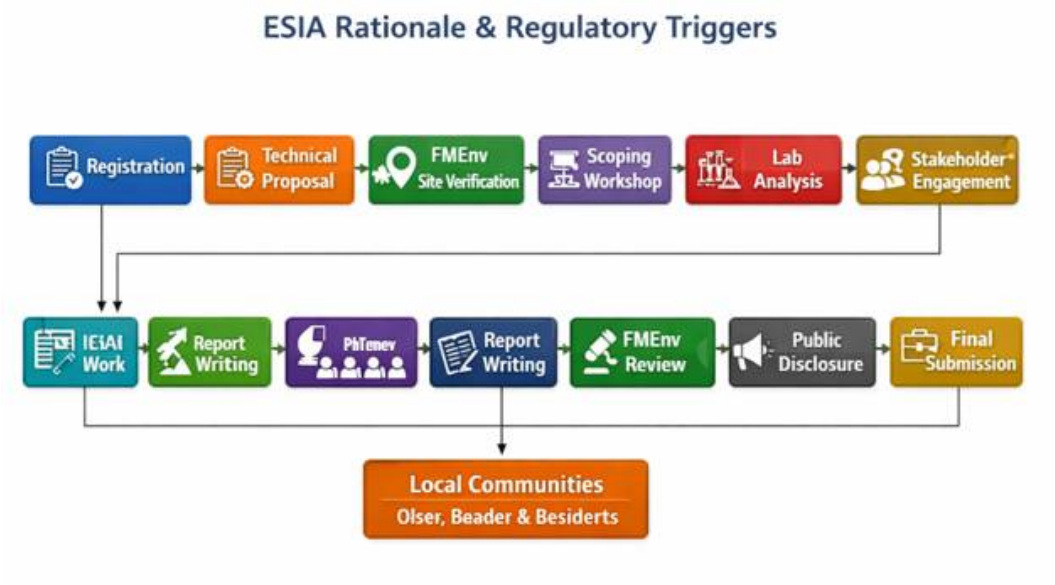


Figure 1.6: ESIA Process Flowchart

The ESIA process comprises the following steps:

1. Registration with FMEnv
2. Technical Proposal Submission
3. FMEnv Site Verification
4. Scoping Workshop (stakeholder-inclusive)
5. Fieldwork and Data Collection
6. Laboratory Analysis
7. Stakeholder Engagement
8. Report Writing and Draft ESIA Submission
9. FMEnv Review and Panel Assessment
10. Public Disclosure (21 days FMEnv; 120 days AfDB)
11. Final Submission
12. Issuance of EIA Certificate

This process ensures that the ESIA meets national regulatory requirements and aligns with international best practice for high-risk, multi-site infrastructure projects.

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:**

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

Table 1.3 – Nigerian Federal Regulatory Framework

Law / Regulation	Key Provisions	Relevance to LSHIP	Compliance Action
EIA Act Cap E12 LFN 2004 (Federal Ministry of Environment, 2004)	Section 2 – Mandatory EIA for prescribed activities; Category I designation	Project triggers Category I (mandatory full EIA)	Registration (Form EIA 1) submitted; ESIA prepared; public disclosure to follow; EIA Certificate to be obtained
NESREA Act 2007 (National Environmental Standards and Regulations Enforcement Agency, 2007)	Enforcement of air, water, noise, waste standards	Construction and operation must meet NESREA limits	Monitoring plan includes NESREA limits; exceedances trigger corrective action
National Environmental (Air Quality Control) Regulations, 2021 (National Environmental Standards and Regulations Enforcement Agency, 2021)	PM2.5 (25 µg/m³), PM10 (50 µg/m³), NO2 (40 µg/m³), SO2 (20 µg/m³), CO (10 mg/m³)	Dust from earthworks, vehicle emissions, generator operation	Water spraying, covered trucks, low-sulphur diesel, real-time monitoring

A distinction is drawn between the NESREA Act 2007 (the enabling statute) and its subsidiary instruments the NESREA Regulations (2009, 2011 and 2021) made under that Act.			
National Environmental (Noise Standards and Control) Regulations, 2009 (National Environmental Standards and Regulations Enforcement Agency, 2009)	Residential day 55 dB(A), night 45 dB(A); Commercial 65/55; Industrial 70/60	Construction noise near school and houses	Restrict hours (7:00–18:00), temporary barriers, community notification
National Environmental (Surface and Groundwater Quality Control) Regulations, 2011 (National Environmental Standards and Regulations Enforcement Agency, 2011)	pH (6.5–8.5), BOD (6 mg/L), coliforms (0 CFU/100ml), iron (0.3 mg/L), copper (0.01 mg/L)	Wastewater discharge, stormwater runoff, dewatering	No untreated discharge; silt fences; septic tanks;

National Environmental (Sanitation and Wastes Control) Regulations, 2009 (National Environmental Standards and Regulations Enforcement Agency, 2009)	Proper waste management, segregation, storage, collection, disposal; prohibition of open burning	Construction waste, medical waste, hazardous waste (asbestos)	Waste Management Plan; HMWMP; LAWMA collection; licensed disposal
Harmful Waste Act Cap H1 LFN 2004 (Federal Government of Nigeria, 2004)	Prohibits import, transport, dumping, deposit of harmful waste in air, land, or water; criminal penalties	Asbestos (9 sites), chemical waste, pharmaceutical waste, infectious waste	Licensed asbestos abatement; double-bagging; labeled transport; hazardous waste landfill
Land Use Act Cap L5 LFN 2004 (Federal Government of Nigeria, 2004)	Sections 28-29 – Compulsory acquisition; Section 30 – Compensation; Section 36 – Occupation without title	Resettlement at 6 sites (Agboju, Ogba, Olorunda, Agura, Agboyi, Ikorodu GH) (No resettlement in Ibeju Lekki cluster 6)	RAPs with compensation at full replacement cost; livelihood restoration
Violence Against Persons (Prohibition) Act 2015 (Federal Government of Nigeria, 2015)	Sections 1-10 – Prohibits sexual violence, exploitation, harassment	GBV/SEA/SH risks during construction and operation	GBV Action Plan; Code of Conduct; referral pathways; survivor-centered response
National Biosafety Management Agency Act 2015 (National	Sections 12-18 – Biosafety permits,	BSL-3/BSL-4 laboratory (IDRI Yaba)	Biosafety permit; containment

Biosafety Management Agency, 2015)	containment measures, inspections		verification; NCDC certification; EPRP
Child Rights Act 2003 (Federal Government of Nigeria, 2003)	Prohibits child labour, trafficking and exploitation; fixes 18 years as age of majority; protects the welfare, education and rights of the child.	Prohibits engagement of minors on construction sites; informs contractor age-verification and labour screening.	Contractor CESMP to mandate age verification at recruitment (no person under 18 engaged); Code of Conduct and worker induction.
Labour Act CAP L1 LFN 2004 (Federal Government of Nigeria, 2004)	Regulates terms and conditions of employment, wages, working hours, rest, and prohibits forced/compulsory labour.	Governs engagement, remuneration and working conditions of construction workers; forced-labour prohibition.	Written contracts for all workers; Labour Management/Influx Plan; workers' grievance mechanism.
Employee's Compensation Act 2010 (Federal Government of Nigeria, 2010)	Provides for compensation to employees for occupational injuries, disease, disability or death arising from employment.	Mandates compensation arrangements for construction-phase OHS incidents.	Contractor to register workers under the NSITF/ECA scheme; OHS Plan; incident reporting and investigation.
Endangered Species (Control of International Trade and Traffic) Act CAP E9 LFN 2004, as amended (Federal	Conserves and protects endangered species of wild fauna and flora; restricts hunting, capture and trade (domesticating CITES).	Relevant where site preparation/clearing could affect protected species or habitats.	Biodiversity screening; chance-find procedure for protected species; prohibition on trade in/harm to listed species.

Government of Nigeria, 2004)			

1.6.2 State-Level Environmental Permit Requirements

Table 1.4 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 1.4 State-Level Environmental Permit Requirements

Responsible Agency	Required Permits / Approvals	Status / Action
LASEPA (Lagos State Environmental Protection Agency, 2017)	State EIA concurrence; waste management permit; water abstraction permit; air quality permit (generators, incinerator); noise permit (if night work); asbestos abatement permit	To be obtained prior to construction commencement. Permit applications to be submitted within 30 days of EIA Certificate.
LAWMA (Lagos State Waste Management Authority, 2019)	Waste collection agreement; medical waste disposal agreement; hazardous waste manifest system	To be executed for each facility. Isolo PHC requires immediate remediation (waste accumulation since September 2025).
Lagos State Ministry of Physical Planning (Lagos State Government, 2022)	Building plan approval; planning permit	To be obtained for new construction sites.
LASWARCO (Lagos State Water Regulatory Commission, 2018)	Borehole drilling permit; water abstraction license	To be obtained for new boreholes.
Lagos State Safety Commission (LSSC) (Lagos State Safety Commission Law, 2011)	Construction-site safety registration and Safety Compliance Certification; periodic OHS inspections in line with the Lagos State Safety Commission Law and Lagos State Safety Regulations.	Register all construction sites with the LSSC; obtain Safety Compliance Certification; align Contractor CESMP/OHS Plan with LSSC requirements and submit to periodic inspection.

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

1.6.3 AfDB Operational Safeguards (OS1-OS10)

Table 1.5: AfDB Operational Safeguards Triggered (ISS 2023/2024)

AfDB Operational Safeguard (2023/2024)	Key Safeguard Requirements / Context	Compliance Action / Mitigation Measure
OS1: Environmental & Social Assessment	Triggered: Category 1 requires full ESIA with stakeholder engagement, alternatives analysis, ESMP, monitoring, and disclosure.	APA, Igbogbele, and Farasime trigger OS1. Full ESIA prepared for the three PHC facilities.
OS2: Labour & Working Conditions	Triggered: Fair labour conditions; OHS; prohibition of child/forced labour; worker grievance mechanisms.	Labour influx and occupational hazards at APA, Igbogbele, and Farasime require contractor OHS measures, labour management procedures, and Codes of Conduct.
OS3: Resource Efficiency & Pollution Prevention	Triggered: Pollution prevention hierarchy; hazardous materials management; waste management plan; resource efficiency.	Construction and operation at APA, Igbogbele, and Farasime will require controls for construction waste, possible asbestos or old-material removal, healthcare waste, fuel/chemical storage, and wastewater management.
OS4: Community Health, Safety & Security	Triggered: Community health and safety; GBV/SEA/SH prevention and response; traffic safety; emergency response.	Traffic safety and community interface risks at APA, Igbogbele, and Farasime require Traffic Management Plans, CHS protocols, and GBV/SEA/SH risk mitigation.
OS5: Land Acquisition, Restrictions on Land	Triggered: Avoid or minimise resettlement; where unavoidable, prepare RAP,	Any site-specific encroachment, boundary adjustment, or land-related impact at APA, Igbogbele, and/or Farasime will require

Use & Involuntary Resettlement	ensure livelihood restoration, and vulnerable group support.	RAP/LRP preparation and implementation in line with AfDB OS5.
OS6: Biodiversity & Ecosystem Services	Triggered: Avoid critical habitat; where unavoidable, demonstrate no net loss or net gain; ecosystem services assessment.	Environmental screening for APA, Igbogbele, and Farasime to assess proximity to wetlands, flood-prone areas, mangrove/coastal ecosystems, and other sensitive receptors in the Badagry Axis Group 7.
OS7: Indigenous Peoples	Not Triggered: Screening confirms no groups meeting the AfDB criteria for Indigenous Peoples are present in the Badagry Axis Group 7. PDF	No specific mitigation required under this OS. Standard community engagement applies under OS10.
OS8: Cultural Heritage	Triggered: Protection of tangible and intangible heritage. While no sites are in the direct footprint, excavation poses a risk to subsurface artifacts. PDF	Implement a strict Chance Finds Procedure during all earthworks. Consult with traditional institutions regarding nearby sacred sites (e.g., Zangbeto spots, altars). PDF
OS9: Financial Intermediaries	Not Triggered: The LSHIP is a direct investment infrastructure project and is not routed through Financial Intermediaries.	Not applicable.
OS10: Stakeholder Engagement & Information Disclosure	Triggered: Meaningful and continuous consultation; accessible grievance redress mechanism (GRM); timely disclosure.	Implementation of a comprehensive Stakeholder Engagement Plan (SEP) and an accessible project-level Grievance Redress Mechanism (GRM) across APA, Igbogbele, and Farasime.

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

Figure 1.7 illustrates the Environmental and Social (E&S) Risk Assessment and Management Framework adopted for the Lagos State Health Infrastructure Project (LSHIP) Badagry Axis Group 7, in alignment with the African Development Bank's Integrated Safeguards System (ISS, 2024).

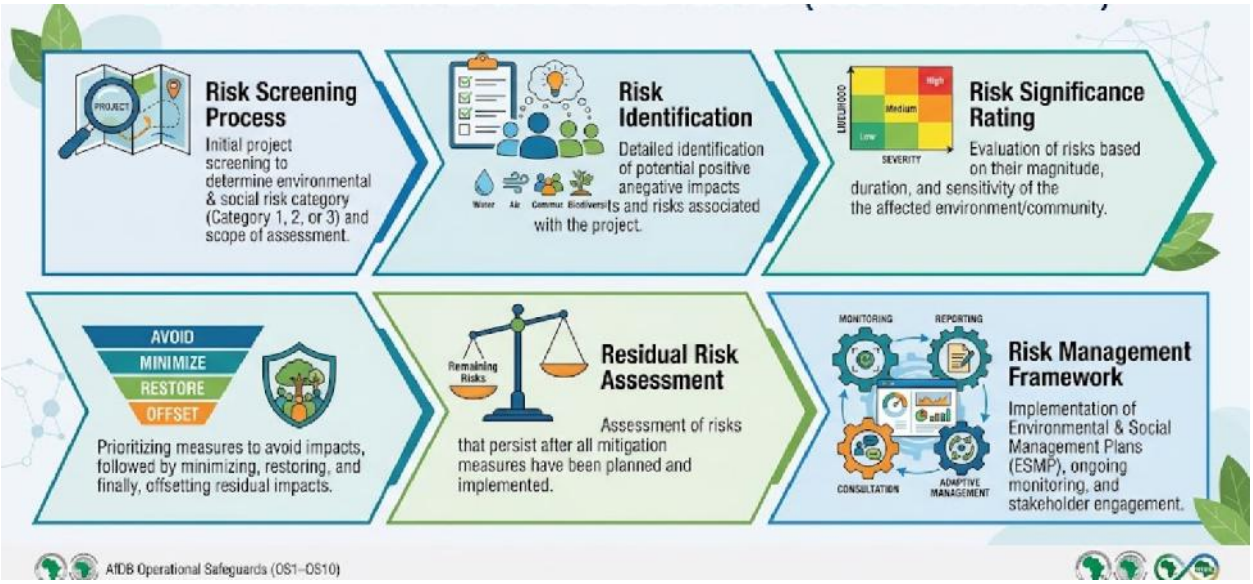


Figure 1.7: Assessment and Management of Environmental & Social Risks (AfDB OS1–OS10)

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 (APA, Igbogbele, & Farasime) 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)

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, Very High). This rating guides prioritization of mitigation measures and monitoring requirements.

4. Mitigation Hierarchy (OS1–OS10)

The ESIA applies AfDB's mitigation hierarchy:

1. Avoid – redesign, site adjustments, tree retention, avoiding sensitive receptors
2. Reduce – engineering controls, noise barriers, dust suppression, drainage upgrades
3. Mitigate – medical waste treatment systems, septic upgrades, PPE, GBV Action Plan
4. 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.
- **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.

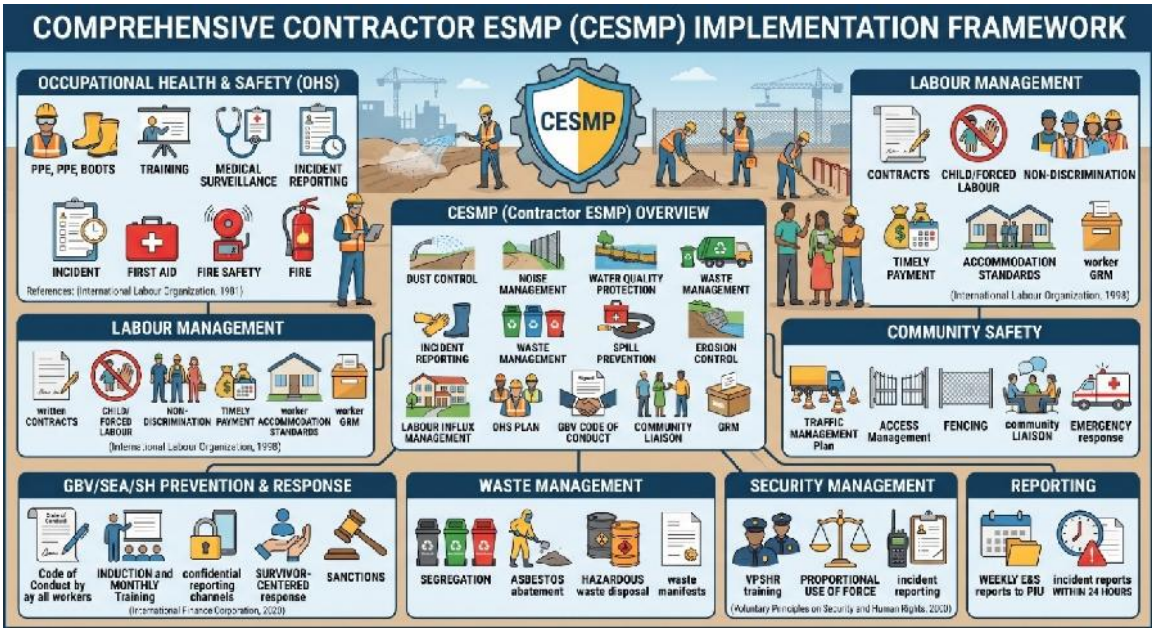


Figure 1.8: Contractor Compliance Requirements for ESMS Components

1.8 Project Risk Categorisation

FMEnv Category I requires a mandatory full EIA due to scale (29 facilities), sensitivity (wetlands, mangroves), magnitude of impacts (resettlement, asbestos, labour influx), public interest, and cumulative impacts (Federal Ministry of Environment, 2004).

AfDB Category 1 (High Risk). Confirmed by December 2025 Identification Mission based on (African Development Bank, 2025):

1. Multi-site complexity (29 facilities).
2. Involuntary resettlement at 6 sites (>200 PAPs at Agboju).
3. Environmentally sensitive sites (Omolaiye waterlogged area, wetlands).
4. Lack of dedicated E&S capacity within the PIU (institutional weakness).
5. Water crossings requiring boat transport (Gberefu, Agboyi).

IFC Category A Mirrors AfDB Category 1 (International Finance Corporation, 2012).

Equator Principles IV Category A requires independent ESIA, climate risk assessment (TCFD-aligned), human rights due diligence, independent monitoring (IESM), and 120-day public disclosure (Equator Principles Association, 2020).

1.9 Involuntary Resettlement Integration (ESS5/PS5)

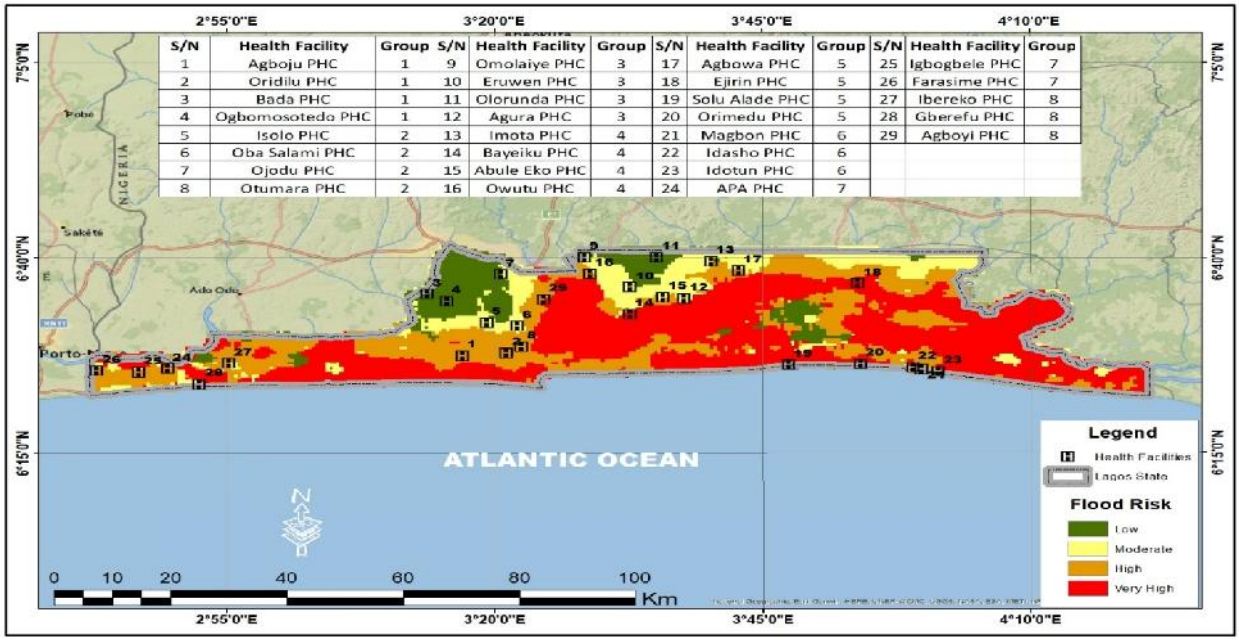
No physical displacement was identified across the three project sites. Baseline resettlement screening confirmed that no residential structures, businesses, or farmlands are present within the project footprints at APA, Igbogbele, or Farasime. All parcels are government-owned and already gazetted, enabling project implementation without triggering a Resettlement Action Plan (RAP) or Livelihood Restoration Plan (LRP).1.10 Climate Alignment (Paris Agreement, TCFD, and 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 1.9:

Below is 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 (Intergovernmental Panel on Climate Change, 2021)
Coastal erosion / sea-level rise	Orimedu, Idotun, Gberefu, APA Badagry West, Ibeju Lekki GH	Sea-level rise 0.2-0.5 m; increased storm surge (Intergovernmental Panel on Climate Change, 2021)
Heatwaves	All urban sites (Ogba, Otumara, Oba Salami, Isolo, Shomolu GH)	+2-3°C; >40°C days increase from 10/year to 60/year (Nigerian Meteorological Agency, 2024)
Extreme rainfall / storms	All sites	+20-30% intensity (Intergovernmental Panel on Climate Change, 2021)



S/N	Health Facility	Group	S/N	Health Facility	Group	S/N	Health Facility	Group	S/N	Health Facility	Group
1	Agboju PHC	1	9	Omolaiye PHC	3	17	Agbowa PHC	5	25	Igbogbele PHC	7
2	Oridilu PHC	1	10	Eruwen PHC	3	18	Ejirin PHC	5	26	Farasime PHC	7
3	Bada PHC	1	11	Olorunda PHC	3	19	Solu Alade PHC	5	27	Ibereko PHC	8
4	Ogbomosotedo PHC	1	12	Agura PHC	3	20	Orimedu PHC	5	28	Gberefu PHC	8
5	Isolo PHC	2	13	Imota PHC	4	21	Magbon PHC	6	29	Agboyi PHC	8
6	Oba Salami PHC	2	14	Bayeiku PHC	4	22	Idasho PHC	6			
7	Ojodu PHC	2	15	Abule Eko PHC	4	23	Idotun PHC	6			
8	Otumara PHC	2	16	Owutu PHC	4	24	APA PHC	7			

Figure 1.9 Flood Risk Assessment of Primary Health Centres in Lagos State

1.10.2 Adaptation Measures (Climate-Resilient Design)

All 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 hour's 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 through 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

A gender analysis was conducted during reconnaissance. Key findings (Multiple Development Services, 2026; Lagos State Ministry of Women Affairs and Poverty Alleviation, 2023):

- Women face barriers to healthcare access (cost, transport, childcare, lack of female staff, safety concerns).
- Construction workforce is typically male-dominated; operation workforce (clinical) is predominantly female.
- GBV/SEA/SH risk is High at Agboju, Ogba, Otumara, Isolo, Agboyi, and Gberefu due to labour influx (500-1,000 workers), poor lighting, isolated paths, economic vulnerability, and lack of confidential reporting mechanisms.

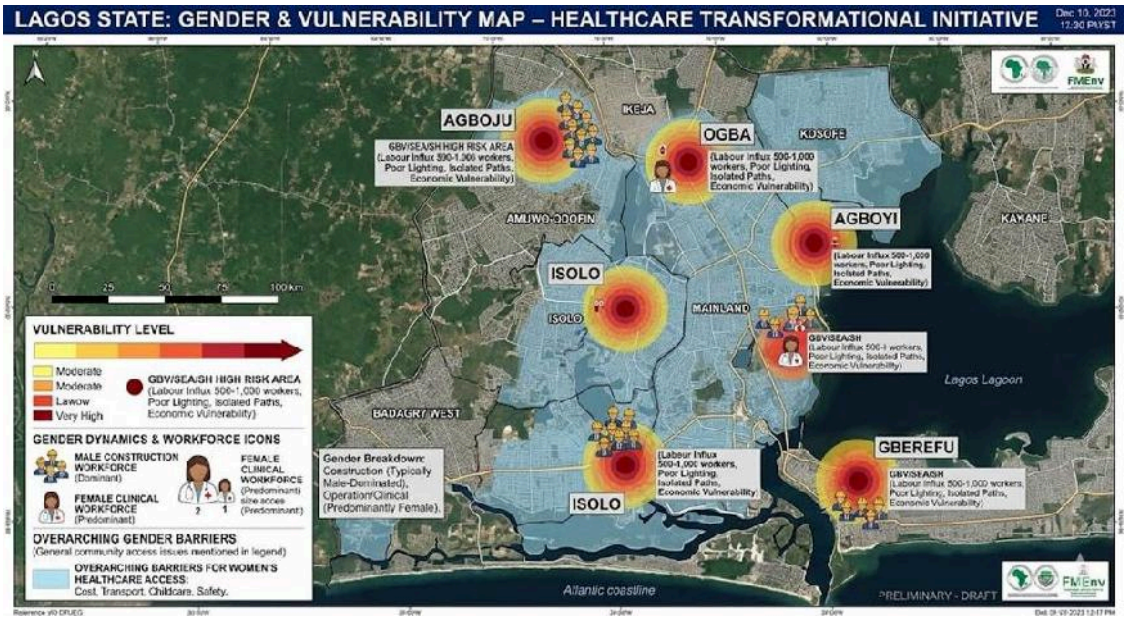


Figure 1.7 A gender and vulnerability map of Lagos State

1.11.2 AfDB OS5 – GBV/SEA/SH Compliance

The LSHIP is fully aligned with AfDB Operational Safeguard 5 (OS5) – Labour, Working Conditions, and Community Health & Safety (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 1.6: LSHIP Alignment with AfDB OS5 GBV/SEA/SH Requirements

OS5 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
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 1.7 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 1.7 – 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

Local hiring (within LGA)	≥50% of unskilled labour	Monthly contractor report

1.12 Environmental and Social Management and Institutional Leadership

1.12.1 Institutional Leadership and Communication Structure

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

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 1.8 shows the project governance structure comprising the levels of different entities.

Table 1.8: Project Governance Structure for Safeguards Instrument

Level	Entity	Role	Key Responsibilities
Financing Institution	African Development Bank (AfDB)	Oversight & Supervision	Approve safeguard instruments Conduct supervision missions Review monitoring reports Enforce covenants
Regulatory Oversight (Federal)	Federal Ministry of Environment (FMEnv) & National Environmental Standards and Regulations	Regulatory Authority	**FMEnv:** Issue EIA Certificate Review ESIA and ESMP Conduct compliance inspections

	Enforcement Agency (NESREA)		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, FMEnv, and NESREA
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 1.10 establishes the communication channels for environmental and social management across the LSHIP.

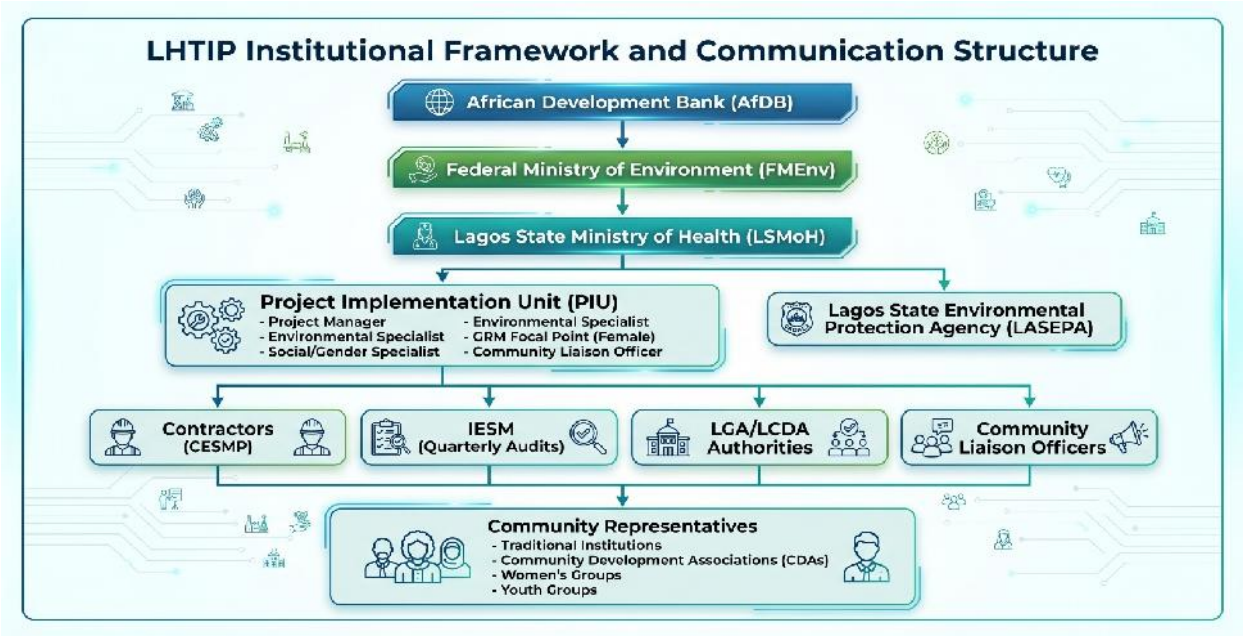


Figure 1.10: LSHIP Institutional Framework and Communication Structure

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 1.9. 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: Quarterly 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

D. Community Liaison Structure

Table 1.10 The following community liaison structure is established for each PHC site:

Table 1.10: 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.

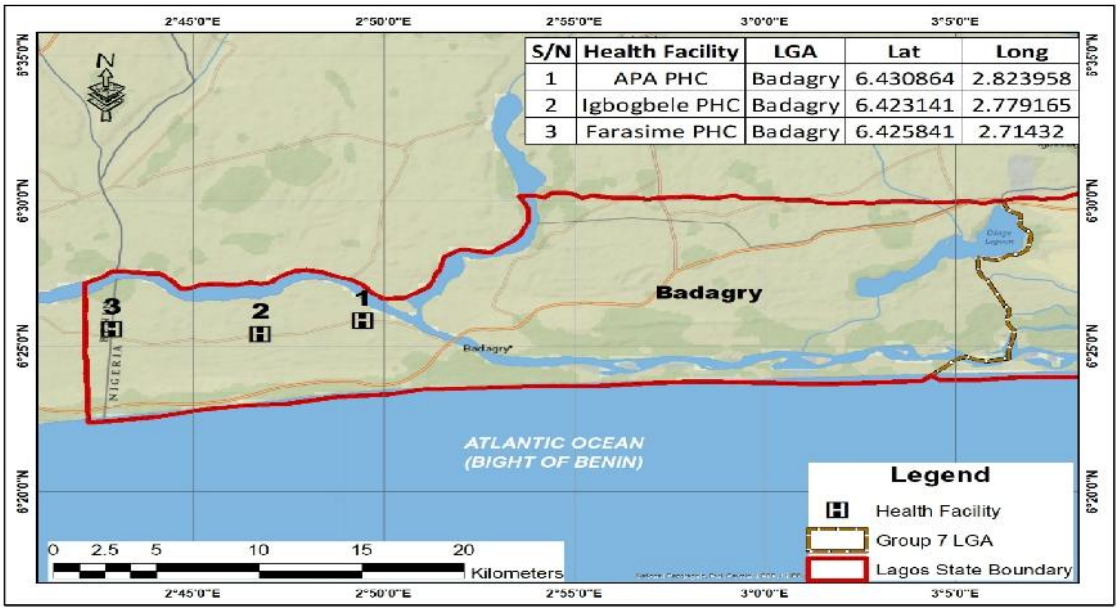


Figure 1.11 – Map of Badagry Axis Group 7 Covered by this ESIA Report

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

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.
- **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.
- **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:

1. Okwesa Francesca – FMEnv, Abuja
2. Oshimowo T. Bolaji – Ministry of Environment & Water Resources, Lagos State
3. Adenaike Olubunmi O. – FMEnv, Lagos Zonal Office
4. Oyawoye Anuoluwa – LSMOE/WR
5. Mr. Braimoh – PHCB
6. Shittaboy Tolulope – FMEnv, Lagos Zonal Office
7. Kehinde Biok T. – FMEnv, Lagos Zonal Office
8. 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.





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 (including Badagry community stations) in Yoruba 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 Riverine Communities (APA, Igbogbele, Farasime)

- **Local Disclosure Points:** In addition to LSMoH headquarters and Badagry LGA secretariat, hard copies of the ESIA and Non-Technical Summary will be available at:
    - APA PHC waiting area
    - Igbogbele PHC waiting area
    - Farasime PHC waiting area
    - Badagry LGA Secretariat
    - Community halls in each catchment
- **Boat Transport:** For Farasime, which has limited road access and is a waterfront community, copies will be transported by boat to the community and made available at the PHC and fish-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 submitted to FMEnv and AfDB.

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)
- **Egun** (indigenous language of Badagry coastal communities) – where feasible

CHAPTER 2 – PROJECT JUSTIFICATION & ALTERNATIVES

2.1 Introduction

This chapter presents the justification for the Lagos State Health Infrastructure Project (LSHIP) and demonstrates why the project is necessary, 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 option against reasonable alternatives including the no-project option, alternative sites, engineering designs, construction methods, and climate adaptation strategies.

The alternatives analysis follows:

- AfDB Operational Safeguard 1 (OS1) – alternatives analysis including no-action, technological, site, design, and operational alternatives (African Development Bank, 2024)
- FMEnv EIA Act CAP E12 LFN 2004 (Section 4 – consideration of alternatives) (Federal Ministry of Environment, 2004)
- 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 the sites. 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 Badagry Axis Group 7 facilities covered in this report.

2.2 Project Justification

2.2.1 Deficiencies of Existing Healthcare Infrastructure

Based on the site assessments and structural evaluations, the deficiencies across the healthcare facilities are categorized into three primary pillars. These findings highlight the gap between current conditions and the required standards for safe, efficient clinical operations.

1. Structural & Environmental Deficiencies

The physical integrity of the buildings often compromises the safety of both patients and staff.

Key issues identified include:

- Building Envelope Integrity: Widespread evidence of roof leaks and dampness, leading to compromised ceiling boards and the growth of mold/mildew.
- Surface Finishes: Use of non-medical grade, porous floor tiles and wall paints that do not support rigorous disinfection protocols.

- Accessibility: Lack of standard ramps, narrow doorways, and inadequate signage, making the facilities difficult to navigate for Persons with Disabilities (PWDs).
- Perimeter & Security: Incomplete or dilapidated fencing at several sites, leading to encroachment and security risks for night-shift staff.

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

The lack of consistent "Life Safety" utilities is a critical barrier to infection prevention and control (IPC).

- Water Supply: Dependence on untreated borehole water without functional filtration systems. Several sites report inadequate storage capacity or rusted overhead tanks.
- Sanitation & Waste: Poorly demarcated waste zones. Existing incinerators are often non-functional or do not meet emission standards, leading to the open burning of medical waste.
- Power Reliability: Heavy reliance on petrol/diesel generators due to unstable grid connection. A lack of renewable energy backups (solar) frequently interrupts cold chain maintenance for vaccines.
- Hygiene Facilities: Inadequate ratio of functional toilets to patient volume. Many staff and patient restrooms lack basic handwashing stations or "elbow-action" taps.

3. Clinical & Space Deficiencies

Spatial layouts often fail to support modern clinical workflows or patient privacy.

- Zoning & Flow: Poor separation between "clean" and "dirty" areas. In many units, the laundry and sterilization areas are too close to consultation rooms, increasing the risk of cross-contamination.
- Patient Privacy: Consultations often take place in cramped, shared spaces without adequate partitioning or soundproofing.
- Specialized Storage: Lack of dedicated, temperature-controlled pharmacies and secure stores for medical records.
- Capacity Overload: Waiting areas are consistently undersized for the catchment population, leading to overcrowding in corridors and outdoor porches.

Note on Compliance: To meet international healthcare standards, the facilities will shift from reactive maintenance to a comprehensive "Resilient Infrastructure" model that integrates climate-smart cooling and sustainable WASH solutions.

Summary Table of Site-Specific Deficiencies

The following table provides a summary of the site-specific deficiencies identified across the assessed Primary Health Centres (PHCs). These observations categorize the physical state of the facilities alongside the resulting risks to healthcare delivery.

Table 2.1: Site-Specific Deficiencies

Facility	Primary Infrastructure Deficiency	Clinical Impact
APA PHC	Insufficient built-up area and lack of staff housing.	Limited 24/7 emergency capacity; high staff turnover.
Igbogbele PHC	Extensive roofing decay and persistent ceiling leaks.	Unhygienic ward conditions; high risk of damage to medical equipment.
Farasime PHC	Blocked drainage systems and seasonal perimeter flooding.	High risk of waterborne diseases and restricted emergency access.

2.2.2 Safety Issues

The safety profile of the project area is divided into the current baseline of the facilities, the risks introduced during the refurbishment phase, and the long-term implications for the surrounding population.

1. Facility-Specific Safety Risks (Current Baseline)

Existing conditions at the Primary Health Centres (PHCs) present immediate hazards to current occupants:

- Biohazards & Air Quality: Persistent dampness and roofing leaks (notably at Igbogbele and Farasime) have led to extensive mold growth, creating respiratory risks for patients with underlying conditions.
- Fire Safety Gaps: Most facilities lack functional fire detection systems, extinguishers, or clearly marked emergency assembly points.
- Insecure Perimeters: Lack of adequate fencing allows unauthorized access, posing a physical security risk to medical staff during night shifts.

2. Occupational Health & Safety (OHS) during Construction

The planned refurbishment and construction activities introduce high-risk variables for the workforce:

- Physical & Mechanical Hazards: Risk of falls from heights during roof replacements and injuries from the operation of heavy machinery in confined clinical compound spaces.
- Hazardous Materials: Potential exposure to asbestos (in older ceiling boards) and lead-based paints during demolition, requiring specialized handling and PPE.
- Bio-Contamination: Risks associated with excavating areas near old soakaways or medical waste pits, which may contain sharp objects or pathogens.

- Environmental Stressors: High noise levels and dust inhalation during structural drilling, which can impact both the construction team and any healthcare services continuing nearby.

3. Community & Public Safety Concerns

The project's footprint extends beyond the site boundaries, affecting the local residents and the general public:

- Traffic & Logistics: Increased movement of heavy-duty vehicles transporting construction materials through narrow community roads, raising the risk of traffic-related accidents.
- Infectious Disease Transmission: Potential for the spread of communicable diseases due to the influx of labor (labor camps) into small, rural, or semi-urban communities.
- Waste & Pollution: Improper disposal of construction debris or hazardous effluents could contaminate local water sources, particularly in coastal areas sensitive to groundwater pollution.
- General Public Access: The risk of community members, particularly children, wandering into unsecured construction zones if proper hoarding and "Danger" signage are not maintained.

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.
Security Gaps	Construction of reinforced perimeter walls and installation of solar-powered site lighting.
Waste Hazards	Implementation of a Medical Waste Management Plan including color-coded bins and lined pits.

2.2.3 Congestion

The "Congestion" factor across the 29 Primary Health Centres (PHCs) is a multifaceted challenge that impacts clinical outcomes, operational efficiency, and the safety of the surrounding community. Under the Lagos State Health Infrastructure Project (LSHIP), these bottlenecks are addressed through spatial redesign and infrastructural expansion.

1. Clinical & Patient Congestion

Current facilities struggle with high patient-to-space ratios, leading to:

- Waiting Room Overload: Patients often spill out into corridors or outdoor porches due to undersized waiting areas, increasing the risk of airborne cross-infection (e.g., TB or respiratory viruses).
- Consultation Bottlenecks: A lack of sufficient consulting rooms results in long wait times, often forcing "triage" to occur in public view, which compromises patient confidentiality.
- Maternal & Child Health (MCH) Strain: Immunization days often see extreme crowding, overwhelming the limited space for weighing, counseling, and vaccination.

2. Space & Layout Congestion

The internal architecture of the baseline facilities is frequently inefficient:

- Poor Zoning: Inadequate separation between "clean" clinical areas and "dirty" service areas (laundry/waste) creates operational friction and physical crowding in transit points.
- Storage Deficiencies: Medical supplies and records are often stored in active clinical areas or hallways because of a lack of dedicated, secure storage rooms.
- Inadequate Staff Quarters: Where staff live on-site, quarters are often cramped, leading to poor rest conditions and reduced efficiency for emergency call-backs.

3. Logistics & Access Congestion

External factors hinder the smooth flow of people and supplies:

- Narrow Access Roads: Many PHCs are located in densely populated or rural areas with narrow, unpaved tracks that make ambulance access and medical supply deliveries difficult.
- Site Encroachment: Over time, local markets or informal settlements have encroached upon facility boundaries, restricting the movement of vehicles and emergency services.
- Construction Logistics: During the project phase, the presence of construction materials, heavy machinery, and workforce teams can temporarily worsen access for patients and ambulances.

4. Mitigation through the LSHIP Project

The LSHIP framework introduces specific interventions to decongest these facilities:

- Spatial Expansion: Increasing the total "Clinical Footprint" by adding new consulting rooms and larger, well-ventilated waiting halls designed for high patient volumes.
- Universal Design & Flow: Implementing standardized "One-Way" patient flows to separate entry and exit points, reducing physical interaction between arriving and departing patients.
- Dedicated Utility Zones: Moving heavy utilities (generators, waste management, and large water tanks) to the perimeter to free up central space for clinical activity.

- Digital Integration: Shifting toward electronic medical records (EMR) to eliminate the need for bulky physical filing cabinets, thereby reclaiming floor space for clinical use.
- Logistics Planning: Site-specific Traffic Management Plans (TMP) during construction to ensure that ambulance bays remain clear and that construction delivery occurs during off-peak hours.

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 (new PHCs serving 50,000 residents each in Badagry Axis Group 7), 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 Group 7 Focus)

The Lagos State Health Infrastructure Project (LSHIP) is designed to deliver far-reaching social dividends across the 29 project sites. Beyond the physical structures, the initiative focuses on strengthening the social fabric of the host communities and improving the quality of life for the residents of Lagos and Ogun States.

1. Enhanced Health Outcomes & Life Expectancy

The primary social benefit is the direct improvement in community health metrics:

- Reduced Maternal and Infant Mortality: Upgraded MCH (Maternal and Child Health) wings provide safer environments for deliveries and neonatal care, directly addressing high-risk births in underserved areas.
- Infection Control: By resolving WASH deficiencies and overcrowding, the project reduces the transmission of hospital-acquired infections and waterborne diseases within the community.

2. Promotion of Social Equity & Inclusion

The project acts as a leveler for marginalized groups:

- Universal Accessibility: Retrofitting facilities with ramps, grab rails, and wider corridors ensures that Persons with Disabilities (PWDs) and the elderly can access healthcare independently and with dignity.
- Gender-Sensitive Care: Improved spatial layouts provide private spaces for breastfeeding, counseling, and gender-based violence (GBV) screenings, making clinics a safer haven for women.

3. Economic Empowerment & Local Livelihoods

The revitalization process injects capital directly into the local economy:

- Job Creation: The construction and rehabilitation phases prioritize the recruitment of local labor (artisans, masons, and security), providing immediate income to households near the sites.
- Skill Transfer: Local workers gain experience in modern, "green" construction standards and Occupational Health & Safety (OHS) protocols, increasing their future employability.
- Micro-Enterprise Support: Increased activity around the PHCs often boosts the patronage of nearby small businesses and vendors.

4. Community Resilience & Psychological Well-being

Modernizing the PHCs restores public trust in the primary healthcare system:

- Improved Patient Experience: Transitioning from dilapidated, "cramped" environments to clean, well-lit, and ventilated spaces reduces patient anxiety and improves the morale of healthcare workers.
- Community Pride: A modern, functional PHC often serves as a landmark of government presence, fostering a sense of belonging and collective ownership among community members.
- Climate Resilience: By installing solar power and sustainable water systems, these PHCs remain functional during grid failures or extreme weather events, serving as "resilience hubs" for the community.

5. Strengthening the Health Governance Framework

The project empowers local health committees and stakeholders:

- Capacity Building: Through the "train-the-trainer" models and updated operational manuals, facility managers and local health committees are better equipped to maintain the assets.
- Accountability: The implementation of the Grievance Redress Mechanism (GRM) gives community members a formal voice, ensuring that healthcare delivery remains transparent and responsive to local needs.

Summary Statement: The LSHIP transcends simple "brick and mortar" renovation; it is a strategic investment in Social Capital, ensuring that quality healthcare is no longer a luxury of distance or income, but a fundamental right accessible at the community level.

Social Benefits Matrix

The following Social Benefits Matrix outlines the projected impact of the Lagos State Health Infrastructure Project (LSHIP). These targets are aligned with the project's Environmental and Social Management Plan (ESMP) and national healthcare benchmarks.

Table 2.3: Social Benefits Matrix

Benefit	**Quantification (Projected/Target)**	**Source**
Maternal & Child Health Improvement	30–40% increase in facility-based deliveries; 25% reduction in neonatal referral delays.	LSHIP Inception Report & NHMIS Data
Job Creation (Local Labor)	Minimum 40% of unskilled/semi-skilled labor sourced from host communities during construction.	LSHIP Labor Management Procedure (LMP)
Disability Inclusion (PWD)	100% compliance with Universal Design standards (ramps, wide doors, PWD-toilets) across all 29 sites.	Lagos State Office for Disability Affairs (LASODA)
Health Literacy & Awareness	Reach of 5,000+ residents per PHC catchment area via community health outreach/GRM engagement.	Community Engagement & Stakeholder Plan
Youth Empowerment & Skills	150+ local artisans trained in sustainable construction and OHS protocols during project lifecycle.	MDSL Capacity Building Framework

Improved IPC Compliance	50% reduction in healthcare-associated infection risks due to upgraded WASH and ventilation.	ESIA Baseline & IPC Standards
Operational Reliability	24/7 power availability for vaccine cold chains via solar hybrid systems at 100% of sites.	Project Technical Specifications (Energy)
Grievance Resolution	95% resolution rate for community-raised concerns within 14 business days.	LSHIP Grievance Redress Mechanism (GRM)
Economic Stimulus	Estimated 15–20% boost in patronage for local micro-vendors near PHC sites during revitalization.	Socio-Economic Impact Assessment

2.4.3 Environmental Benefits (LSHIP Programme)

The Lagos State Health Infrastructure Project (LSHIP) integrates environmental sustainability as a core pillar of its infrastructure strategy. Moving away from "business as usual" construction, the programme delivers significant ecological benefits that align with Nigeria's Climate Change Act 2021 and international green building standards.

1. Climate Change Mitigation & Carbon Reduction

The shift toward sustainable energy directly reduces the carbon footprint of the healthcare sector:

- Decarbonization of Power: Replacing or augmenting fossil-fuel generators with Solar PV Hybrid systems across the 29 sites significantly lowers greenhouse gas (GHG) emissions.
- Energy Efficiency: The use of LED lighting, energy-efficient medical equipment, and passive cooling architectural designs reduces the overall energy demand of each facility.

2. Sustainable Water & Resource Management

LSHIP addresses the chronic water challenges in Lagos and Ogun States through smart resource loops:

- Groundwater Protection: Installation of modern, lined soakaways and bio-digesters prevents the leaching of untreated effluent into the high-water table, protecting local aquifers.
- Water Conservation: The programme introduces low-flow taps and rainwater harvesting systems for non-clinical uses (e.g., floor cleaning, landscaping), reducing the strain on local boreholes.

3. Integrated Medical Waste Management

The project transforms how hazardous materials are handled to prevent environmental toxicity:

- Modernization of Disposal: Replacing open-pit burning with eco-friendly, high-temperature incinerators or autoclaves that meet strict emission standards.

- Waste Segregation: Implementing standardized color-coded waste streams (Infectious, Sharps, and General) ensures that hazardous waste is neutralized before leaving the site, preventing soil and water contamination.

4. Coastal and Ecosystem Resilience

Given the geographical sensitivity of many sites (e.g., Badagry and Ilashe), the project incorporates nature-based safeguards:

- Flood Attenuation: Implementation of permeable paving and improved drainage networks reduces surface runoff and prevents seasonal flooding in low-lying healthcare compounds.
- Anti-Corrosive Design: Using "green" materials resistant to salt-air corrosion in coastal clusters reduces the frequency of maintenance and the waste generated by frequent structural repairs.

5. Indoor Environmental Quality (IEQ)

The refurbishment focuses on a healthy "micro-environment" for occupants:

- Natural Ventilation: Redesigning window placements and ceiling heights to maximize cross-ventilation, which reduces the reliance on mechanical cooling and lowers the risk of airborne pathogen accumulation.
- Non-Toxic Materials: Using low-VOC (Volatile Organic Compound) paints and medical-grade, non-porous surfaces to eliminate off-gassing and ensure a sterile environment.

Table 2.4: Environmental Benefits Matrix (Summary)

Environmental Impact	**Key Intervention**	**Long-term Benefit**
Air Quality	Solar adoption & transition from petrol generators.	Reduction in local air pollutants (NO_x, SO_x) and noise pollution.
Water Security	Treated boreholes & rainwater harvesting.	Reduced depletion of local groundwater reserves.
Land Integrity	Secured medical waste zones & lined septic systems.	Prevention of soil contamination and "Sharp" waste accidents.
Resource Efficiency	Circular economy approach to construction waste.	Diverting debris from landfills through recycling and reuse.

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

Social Impacts (No-Project):

- Continued lack of access to primary care for residents of Badagry Axis Group 7
- 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 (Imota, Abule Eko)

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 – Badagry Axis Group 7)

The analysis of Alignment Alternatives for the 29 PHC sites confirms that the "In-Situ Rehabilitation" model was selected over "Greenfield Development" or "Site Relocation." This strategic choice was governed by the need to minimize social displacement while maximizing existing community access. The selection of sites for the Lagos State Health Infrastructure Project (LSHIP) involved a rigorous comparison between maintaining existing footprints and acquiring new land. The final decision favored "In-Situ" development to preserve community access and minimize social disruption.

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

Site Selection & Alignment Alternatives

The selection of sites for the project involved a rigorous comparison between maintaining existing footprints and acquiring new land. The final decision favored "In-Situ" development to preserve community access and minimize social disruption.

Table 2.5: Site Selection & Alignment Alternatives

Facility	Original/Preferred Site	Alternative Site(s) Assessed	Reason for Rejection
APA PHC	Existing Footprint: Central ward location with established access.	Inland Plot (Unmarked): A larger, vacant plot 2km further inland.	Accessibility: Reduced visibility and emergency response time; lack of existing utility connections (Water/Power).
Igbogbele PHC	Existing Footprint: Traditional community health grounds.	Shoreline Site: A vacant plot closer to the coastal transport hub.	Environmental Risk: High vulnerability to long-term coastal erosion and seasonal storm surges/flooding.
Farasime PHC	Existing Footprint: Village center.	Centralized Hub: Merging Farasime and Igbogbele into one regional facility.	Social Inequity: Increased travel burden for Farasime residents, particularly for pregnant women and the elderly.
Ilashe PHC	Existing Footprint: Coastal village site.	Adjacent Commercial Plot: Negotiated acquisition of neighboring land.	Economic/Social: High cost of acquisition and potential for long-term legal disputes with local landowners.
Wesere PHC	Existing Footprint: Established health post.	Greenfield Site: Undeveloped land at the community outskirts.	Utility Cost: Significant capital expenditure required to extend road access and borehole infrastructure to the site.
Coastal Axis PHCs	In-Situ Rehabilitation.	Consolidated District Hospital: Shifting all PHC functions to a single large hospital.	Primary Care Logic: PHCs must remain at the "first-mile" level to ensure effective immunization and maternal outreach.

Selection Logic Summary

1. Community Trust: The original sites have deep-rooted social "habit," meaning residents are more likely to seek care at a known location than at a new, unfamiliar site.

2. Ease of Implementation: Rehabilitating existing government-owned land avoids the complex and time-consuming Resettlement Action Plan (RAP) and land titling processes.
3. Environmental Stewardship: By opting for "Brownfield" development (existing sites) over "Greenfield" (new land), the project minimizes soil sealing and habitat destruction.
4. Resilience Strategy: For facilities like Igbogbele, the rejection of shoreline alternatives in favor of the original footprint (with upgraded flood defenses) ensures longer asset life against climate change.

Technical Selection Criteria (Summary of Rationale)

The technical selection criteria for the 29 PHC sites ensure that each facility is legally secure, socially integrated, and environmentally resilient. This summary outlines the rationale used to validate the selection of these specific locations under the LSHIP.

1. Land Ownership & Encumbrance

The primary objective was to ensure "Clean Title" to prevent project delays and legal liabilities.

- Rationale: Preference was given to sites with verified Government Ownership (Gazetted land).
- Technical Check: Sites were screened for physical encumbrances, such as illegal structures or informal settlers. By selecting existing footprints, the project avoids the need for complex land acquisition or Resettlement Action Plans (RAP), ensuring that construction can begin immediately upon mobilization.

2. Social Connectivity

Healthcare efficacy is directly linked to how easily a patient can reach the facility during an emergency.

- Rationale: Sites were evaluated based on their "First-Mile" proximity to the catchment population.
- Technical Check: Selection favored locations within a 5km radius of the most densely populated areas of the ward. Connectivity to primary or secondary access roads was a mandatory criterion to facilitate ambulance movement and the delivery of medical supplies without logistical bottlenecks.

3. Environmental Safeguards

The project prioritizes sites that can be made resilient to the specific ecological pressures of Lagos.

- Rationale: Avoidance of "Environmental Red Zones" where possible.
- Technical Check: Each site underwent a baseline screening for Flood Risk and Soil Stability. For sites in the Coastal Cluster (e.g., Badagry Axis Group 7), the selection rationale included the feasibility of implementing climate-adaptation measures, such as elevated floor slabs and salt-resistant building materials, rather than abandoning the community.

4. Cost-Effectiveness

Maximizing the "Health-Return-on-Investment" (HROI) required a balance between rehabilitation costs and long-term utility.

- Rationale: Brownfield Redevelopment (In-situ) was selected as the most cost-effective path compared to Greenfield construction.
- Technical Check: Costs were optimized by leveraging existing peripheral infrastructure (fencing, some viable structural shells, and access roads). By rehabilitating instead of relocating, the project significantly reduces the "hidden costs" of extending the power grid or drilling new deep-aquifer boreholes in unserviced areas.

Table 2.6: Technical Selection Summary Table

Criterion	Rationale	Project Benefit
Land Ownership	Government-owned/Gazetted land.	Zero legal disputes; accelerated commencement.
Connectivity	Central ward location; road access.	Reduced "Time-to-Care" for emergencies.
Safeguards	High ground or drainable terrain.	Long-term asset protection from climate change.
Cost	Utilization of existing footprints.	Maximized budget allocation for clinical equipment.

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 2.7: Engineering Alternatives (Building Design)

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	Lower operating costs (40–60% reduction in energy costs); lower GHG emissions;	Higher upfront cost (estimated 20% premium)	Yes

	lighting, disability-friendly design	climate-resilient; aligns with SDGs and NDCs		

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 2.8: 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; 24–48hour battery backup	Higher upfront cost (but declining)	Yes

2.5.5 Water Supply Alternatives

Table 2.9: 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 2.10: 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 Construction Alternatives

Table 2.11: Construction Alternatives

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)

2.5.8 Climate Alternatives

Table 2.12: 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, cool roofs, solar PV)	Resilient to climate hazards; longer lifespan; lower future adaptation cost; aligns with NDCs	Higher upfront cost (estimated 10–15% premium)	Yes

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).

2.5.9 Waste Management Alternatives

Table 2.13: 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
AfDB-aligned HMWMP (preferred)	Segregation (colour-coded), safe storage, treatment	Protects workers, communities, environment; complies with WHO, AfDB, NESREA	Requires training, equipment, ongoing cost	Yes

	(autoclave), LAWMA disposal			

Justification for AfDB-aligned HMWMP: Mandatory under AfDB OS4, IFC PS3, and NESREA regulations (World Health Organization, 2014).

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 2.14: TCFD AlignmentTCFD 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 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

2.8.1 Local Content Framework

Table 2.15: Local Content Framework

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	Subcontract records

		- Capacity building - Tiered subcontracting	
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 2.16 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 2.17 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

2.9 Circularity & Resource Efficiency

2.9.1 Material Reuse and Recycling

Table 2.18: Material Reuse and Recycling

Material	Source	Reuse/Recycling Potential	Social Benefit
Construction waste (concrete, blocks, steel)	Demolition of existing structures	Crushed concrete and blocks reused as fill; steel recycled	Reduced disposal cost; local recycling jobs
Excavated soil	Earthworks (foundations, drainage)	Reused as fill on site; excess for landscaping	Reduced need for off-site disposal; local use
Wood waste	Formwork, pallets	Reuse for formwork; chipped for mulch; donated to community	Community benefits (wood for fuel, construction)
Metal scrap	Reinforcement steel, pipes	Recycled through local scrap dealers	Supports local scrap recycling industry
Packaging waste	Material deliveries	Reduced through just-in-time delivery; recycling where feasible	Waste management jobs; reduced landfill

2.9.2 Resource Efficiency

Table 2.19: Resource Efficiency

Resource	Efficiency Measure	Estimated Savings	Social Benefit
Energy	Solar PV; LED lighting; natural ventilation	40–60% reduction in grid/diesel consumption	Lower energy costs for PHC operations; reliable power for community health services
Water	Rainwater harvesting (5,000–10,000 L storage); water-efficient fixtures	20–30% reduction in borehole abstraction	Reduced groundwater stress; water security during droughts
Materials	Local sourcing; reduced waste; low-carbon cement	20–30% reduction in embodied carbon	Local economic benefits; lower environmental impact

Table 2.20: Resource Efficiency

Circularity Measure	Social Benefit
Local material sourcing	Supports local businesses and jobs
Waste recycling	Creates waste management jobs; reduces landfill impact
Material reuse	Lowers cost; benefits community through donated materials
Water conservation	Reduces community water stress; supports sustainable water use
Energy efficiency	Lower PHC operating costs; resources available for patient care

2.10 Project Alternative

2.10.1 No Project Alternative

The "No Project" alternative evaluates the consequences of not implementing the Lagos State Health Infrastructure Project (LSHIP) in the Badagry Axis Group 7, specifically the APA, Igbogbele, and Farasime PHCs. Under this scenario, the existing Primary Health Centres would continue operating with their current structural deficiencies, limited capacity, and inadequate service delivery infrastructure.

Failure to implement the project would result in:

- Continued deterioration of public health outcomes, especially maternal and child health indicators.
- Persistent overcrowding at secondary and tertiary health facilities due to weak PHC capacity.
- Reduced access to essential services for vulnerable groups, including women, children, the elderly, and low-income households.
- Inability to meet Lagos State's Universal Health Coverage (UHC) targets and SDG 3 (Good Health and Well-Being).
- Increased disease burden due to poor facility hygiene, inadequate waste management, and limited diagnostic capacity.

- Continued infrastructure decay, leading to higher long-term rehabilitation costs.
- Loss of economic opportunities for local contractors, artisans, suppliers, and labourers.

Given these consequences, the "No Project" alternative is not desirable and does not support Lagos State's health sector development objectives or AfDB's strategic priorities for improving human capital and social infrastructure.

2.10.2 Site-Specific Alternatives for Each PHC

In accordance with AfDB ISS (2023/2024), alternatives were evaluated for each PHC in the Badagry Axis Group 7 to ensure that design, location, layout, and construction approaches minimise environmental and social impacts.

PHC 1: APA Primary Health Centre

- Alternative Location: Relocation to an adjacent parcel was considered; rejected due to land ownership constraints and the likelihood of increased resettlement risk.
- Alternative Design: A larger multi-storey structure was considered; rejected due to site constraints and anticipated structural and cost implications.
- Alternative Layout: New structure to improve patient flow and reduce congestion; selected.
- Alternative Construction Approach: Prefabricated construction elements were considered; rejected due to supply chain limitations and site logistics.

PHC 2: Igbogbele Primary Health Centre

- Alternative Location: Siting behind the existing structure was evaluated; rejected due to drainage limitations and flood vulnerability.
- Alternative Design: Modular expansion was considered; selected for reduced construction time and lower disruption to ongoing service delivery.
- Alternative Access Route: A rear access route was evaluated; rejected due to community safety concerns and land use constraints.

PHC 3: Farasime Primary Health Centre

- Alternative Location: Relocation to a nearby government-owned parcel was considered; rejected due to distance from the target catchment population and reduced accessibility.
- Alternative Layout: Expansion of the waiting area, consultation rooms, and service circulation space was selected to improve functionality and patient comfort.

- Alternative Waste Handling: On-site temporary storage with controlled off-site disposal was preferred over uncontrolled disposal; selected to ensure compliance with healthcare waste management requirements.

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.

2.11 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), 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 APA and strict zero-discharge protocols at the Farasime waterfront—were selected to directly minimise potential adverse environmental impacts, particularly concerning soil erosion, groundwater contamination, and the sensitive aquatic ecology of Badagry Creek.
- 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 Badagry Axis Group 7, comprising APA, Igbogbele, and Farasime PHCs. The preferred option for this cluster is 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 Badagry Axis Group 7 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, secondary, and tertiary healthcare infrastructure through a coordinated, multi-component strategy that integrates physical infrastructure, diagnostic capacity, workforce development, and pandemic preparedness (Lagos State Ministry of Health, 2025). The project is being implemented by the Lagos State Ministry of Health (LSMoH) through a dedicated Project Implementation Unit (PIU). Implementation leverages a mixed model: direct procurement for construction and refurbishment, and structured Public-Private Partnerships (PPPs) for diagnostic services.

The LSHIP comprises four major components. For the Badagry Axis Group 7, 2 components have direct physical footprints:

Component	**Description**	**Badagry Axis Group 7 Sites**	**Intervention Type**
Component 1: Primary Health Infrastructure	New climate-resilient PHCs	1 (APA PHC)	New Construction (Greenfield development)
	Existing PHC refurbishment	2 (Igbogbele & Farasime PHCs)	Total Revitalization (Rehabilitation, damp-proofing, and expansion)

Total facilities covered in this report: 3 PHCs (1 new construction + 2 refurbishment)

3.2 Project Location

3.2.1 Geographic Overview

The Badagry Axis Group 7 is a critical geographic cluster within the Lagos State Health Infrastructure Project (LSHIP). This axis is characterized by its unique coastal positioning, rural-urban transition, and proximity to the international border, all of which dictate the structural and environmental requirements of the healthcare facilities.

1. Geographic Positioning

The Group 7 cluster is situated in the westernmost part of Lagos State, within the Badagry Local Government Area.

- Coastal 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.
- Cross-Border Influence: Located near the Seme border, this axis serves as a primary healthcare gateway for both local residents and transient populations, increasing the strategic importance of the APA PHC as a regional hub.

2. Site-Specific Coordinates and Locations

The group consists of three primary nodes that provide a healthcare "safety net" for the coastal communities:

Table 3.1: Site-Specific Coordinates and LocationsFacility	**Specific Location**	**Geographic Context**
APA PHC	Apa Community, Badagry West	Situated on a major access road; serves as the central anchor for the cluster.
Igbogbele PHC	Igbogbele Village	A rural coastal settlement characterized by low-lying terrain and high-water tables.
Farasime PHC	Farasime/Oko-Afo Axis	Located in an area with a mix of residential and small-scale agricultural land use.

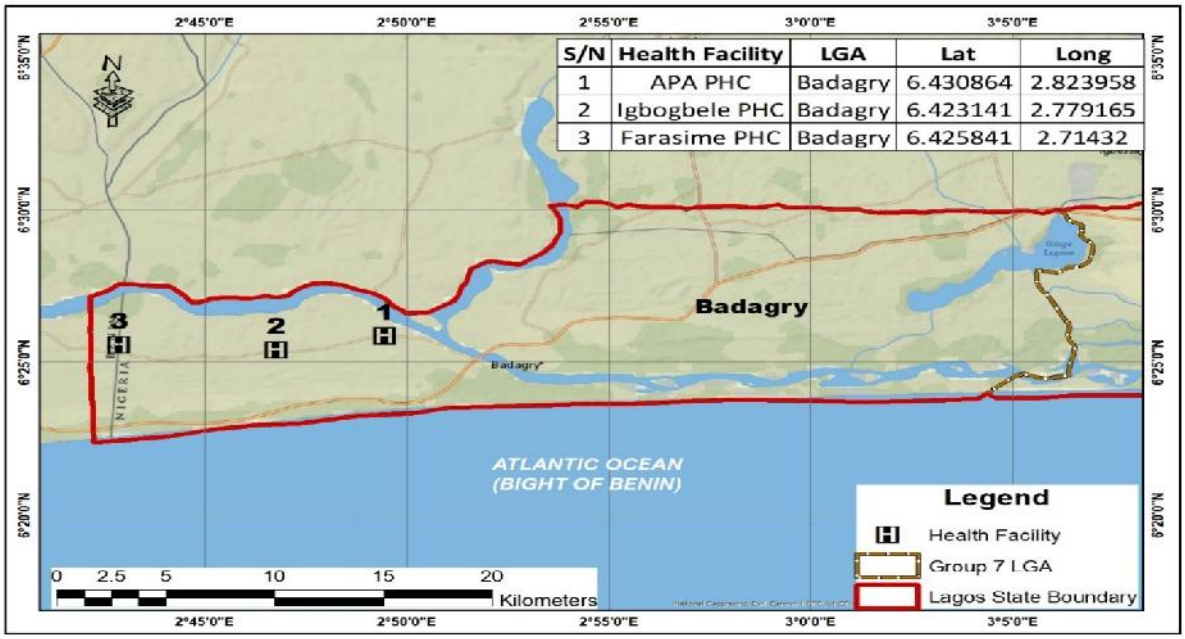


Figure 3.1: Project Area Map for all the 3 sites location

3. Environmental and Terrain Characteristics

The geographic overview of Group 7 highlights several "Environmental Stressors" that influenced the ESIA (Environmental and Social Impact Assessment) and structural design:

- High Water Table: The proximity to the lagoon and ocean results in a shallow water table. This necessitated elevated foundations for the new construction at APA to prevent seasonal flooding.
- Saline Environment: The high salt content in the air causes rapid corrosion of traditional building materials. Geographic mapping led to the recommendation of non-corrosive roofing and specialized "salt-resistant" concrete mixes for all Group 7 refurbishments.
- Ecological Sensitivity: The sites are bordered by coastal vegetation and wetlands. The project location requires strict adherence to the "No-Harm" principle regarding wastewater discharge to protect the lagoon's ecosystem.

4. Accessibility and Connectivity

- Primary Access: Connectivity is primarily via the Lagos-Badagry Expressway, with secondary rural roads leading into the specific communities.
- Referral Mapping: Geographically, Group 7 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.

5. Demographic Catchment

The geographic layout of Group 7 was designed to ensure that no resident in the APA-Igbogbele-Farasime corridor is more than 5km to 10km away from a revitalized healthcare facility, significantly reducing "travel poverty" for maternal and emergency care in this axis.

roject sites

3.2.2 Cluster 1 – Badagry Axis Group 7 - Group 7 Site Summary

Below is the site information table for the Badagry Axis Group 7 – Group 7, detailing the locations and project types for the three primary health centers.

Axis Site Summary Information

Table 3.2: Sites Overview

S/N	Site Name	LGA/LCDA	GPS Coordinates	Address/Landmark	Project Type
1	Apa PHC	Badagry West LCDA	6.4258° N, 2.8125° E	Apa Community, Owode-Apa Road	New Construction
2	Farasime PHC	Badagry West LCDA	6.4012° N, 2.7543° E	Farasime Village, Off Badagry-Seme Expressway	Refurbishment
3	Igbogbele PHC	Badagry West LCDA	6.3985° N, 2.7689° E	Igbogbele Coastal Community	Refurbishment

3.2.3 Site-Specific Characterization: Badagry Group 7

Table 3.3 Site-Specific Realities

Facility	Realities	Key Environmental Risk
APA PHC	Inland location; high patient load due to border proximity.	Potential groundwater contamination from high-density septic use.
Igbogbele PHC	Older structure with confirmed legacy Asbestos-Containing Materials (ACM).	Airborne fiber exposure during roof replacement.
Farasime PHC	Waterfront site with seasonal tidal inundation.	High risk of sediment runoff into the riverine ecosystem.

3.2.4 Cluster Characteristics

Based on the Group 7 – Badagry Axis Group 7 ESIA report and the environmental baseline for the APA, Farasime, and Igbogbele corridor, the following physical and social characteristics define the project area:

1. Topography

- Low-Lying Coastal Plain: The terrain is predominantly flat, characterized by the typical coastal lowlands of the Bight of Benin.
- Elevation: Sites sit at very low elevations (often less than 5–10 meters above sea level).
- Geomorphology: The area consists of unconsolidated coastal plain sands. The flat nature of the topography at Igbogbele and APA contributes to poor natural drainage and vulnerability to ponding during peak rainfall.

2. Hydrology

- Proximity to Water Bodies: The axis is flanked by the Badagry Lagoon to the north and the Atlantic Ocean to the south.
- High Water Table: Ground water levels are extremely shallow (often reaching 1–2 meters below the surface), which complicates foundation works for the New Construction at APA.
- Surface Water Drainage: Natural drainage is sluggish; rainwater tends to settle in depressions, leading to localized waterlogging in the rural settlements of Farasime.

3. Land Use

- Rural-Residential Mix: Land use is primarily a mix of traditional residential settlements and small-holder agricultural plots.
- Institutional Presence: The PHC sites are established "Social Landmarks" within these communities, often surrounded by small-scale commercial activities (kiosks/local markets).
- Agriculture/Fishing: Surrounding lands are used for subsistence farming (cassava, coconut groves) and artisanal fishing activities due to the proximity to the lagoon.

4. Access

- Regional Connectivity: The primary artery is the Lagos-Badagry Expressway, which facilitates the movement of people and medical supplies.
- Local Access: Access to APA and Igbogbele is via secondary paved or semi-paved rural roads. Some sections are prone to flooding, which can restrict ambulance movement during the wet season.
- Referral Logistics: The geographic positioning creates a linear access route toward the Badagry General Hospital for secondary referrals.

5. Environmental Sensitivities

- Coastal Salinity: The high saline content in the air and groundwater causes accelerated corrosion of metallic structures and degradation of building carcasses (as seen in the current deficiencies of Farasime PHC).
- Flooding and Erosion: The axis is identified as a Climate Hazard Zone, sensitive to coastal inundation and seasonal flash flooding.
- Groundwater Vulnerability: Due to the shallow water table, the area is highly sensitive to pollution from improper medical waste disposal or pit latrines.

6. Social Sensitivities

- Vulnerable Populations: High sensitivity regarding Maternal and Child Health outcomes, as these communities rely heavily on these specific PHCs for affordable delivery services.
- Border Dynamics: Proximity to the Seme border introduces a transient population, making the facilities sensitive to sudden surges in healthcare demand.
- Cultural Values: The communities are close-knit; any disruption to healthcare services during construction at APA is a sensitive issue, necessitating the use of temporary service points.
- Livelihood Protection: Construction activities must avoid encroaching on the coconut groves or small farms that form the primary livelihood for residents in the Igbogbele axis.

3.3 Project Particulars

Below are the project particulars for the Badagry Axis Group 7 (Group 7), covering the APA, Igbogbele, and Farasime Primary Healthcare Centres (PHCs).

A. Project Overview

The Lagos Healthcare Transformative Initiative Project (LSHIP) is focused on the APA, Igbogbele, and Farasime Primary Healthcare Centres. Its primary objective is to enhance healthcare delivery, specifically regarding maternal and child health outcomes, by implementing infrastructure modernization and ensuring environmental sustainability.



Figure 3.2: Picture of the Prototype of the Proposed PHCs for Construction

B. Site-Specific Scopes of Work

Table 3.4: Site-Specific Scopes of Work

PHC Location	**Development Strategy**	**Key Engineering/Structural Focus**
APA PHC	Greenfield (New Construction)	Construction of a new flagship facility with elevated foundations for flood resilience.

Igbogbele PHC	Total Rehabilitation	Comprehensive refurbishment focusing on structural dampness remediation, roof replacement, and Water, Sanitation, and Hygiene (WASH) upgrades.
Farasime PHC	Total Rehabilitation	Extensive repair of roofing decay, electrical retrofitting, and modernization of patient flow areas.

C. 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.

D. 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 New Construction Facilities

Table 3.5: Facilities in Badagry Axis Group 7

Facility	LGA/LCDA	Safeguard Requirement	Key Rationale
APA PHC	Badagry West LCDA	ESIA	Greenfield flagship development; requires high-level flood-resilient design due to coastal location.
Igbogbele PHC	Badagry West LCDA	ESMP	Total revitalization and refurbishment of existing structure; focus on remediating structural dampness and upgrading WASH facilities to prevent coastal groundwater contamination.

Farasime PHC	Badagry West LCDA	ESMP	Comprehensive refurbishment of existing facility; involves addressing roofing decay and modernizing internal layouts within a high-vulnerability coastal corridor.

3.3.2 New PHC Design Features

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 3.6: PHC Design Features (APA, Igbogbele, and Farasime PHCs)

Feature	Technical Specification	Environmental & Social Benefits
Flood-Resilient Substructure	Elevated finished floor levels (FFL) and reinforced concrete raft foundations designed for high water tables.	Environment: Prevents structural damage during seasonal flooding. Social: Ensures the facility remains operational and accessible during extreme weather events.
Corrosion-Resistant Materials	Use of aluminum-zinc alloy roofing sheets and marine-grade protective coatings on all external metalwork.	Environment: Reduces waste by extending the lifespan of building materials in high-salinity air. Social: Lowers long-term maintenance costs for the local healthcare board.
Hybrid Solar Power System	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.
Advanced WASH Infrastructure	Solar-powered boreholes with integrated multi-stage filtration and elevated storage tanks.	Environment: Prevents groundwater depletion and contamination. Social: Provides patients and the surrounding community with consistent access to potable water.

Integrated Waste Management	Color-coded segregation bins and on-site lined deep-pit incinerators or secure sharps pits.	Environment: Prevents medical waste from leaching into the coastal ecosystem or lagoon. Social: Protects healthcare workers and the community from needle-stick injuries and infections.
Universal Accessibility (PWD)	Anti-skid ramps with 1:12 gradients, wider doorways, and specialized grab bars in sanitary sections.	Environment: Promotes efficient use of space within the existing footprint. Social: Ensures inclusive healthcare access for elderly residents and persons with disabilities.
Thermal Comfort Design	High ceilings, cross-ventilation window placement, and heat-reflective roof paint.	Environment: Minimizes the need for energy-intensive air conditioning. Social: Creates a dignified and comfortable recovery environment for mothers and newborns.



Figure 3.3: 3D rendering of typical new PHC (Exterior)



Figure 3.4: 3D Rendering of Typical New PHC – Shared Ward (interior)

3.4 Project Particulars – Refurbishment (2 Facilities)

The revitalization of Igbogbele and Farasime 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 3.7: Refurbishment Facilities in Badagry Axis Group 7

Facility Name	LGA / LCDA	Development Class	Primary Structural Challenge
Igbogbele PHC	Badagry West LCDA	Refurbishment	Severe rising damp and failing WASH infrastructure due to high coastal water table.
Farasime PHC	Badagry West LCDA	Refurbishment	Compromised roofing envelope and salt-air corrosion of external fixtures.

Table 3.8: Refurbishment Scope by Activity

Activity Category	Specific Scope of Works
Civil & Structural	Stripping of salt-damaged plaster; application of damp-proof membranes; repair of foundation settlements.
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.
WASH Upgrades	Installation of solar-powered boreholes with multi-stage filtration; construction of lined, non-permeable septic tanks.
Internal Remodeling	Reconfiguration of patient flow to expand maternal wards and ensure Infection Prevention and Control (IPC) compliance.

3.4.1 Site-Specific Sensitivities – Refurbishment

The refurbishment phase for Igbogbele and Farasime will 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 Igbogbele and Farasime PHCs.

Table 3.9: Site-Specific Sensitivities – Refurbishment

Sensitivity Category	Management Requirement	Objective
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.

3.5 Process Description

3.5.1 Pre-Construction Phase (Badagry Axis Group 7)

The pre-construction phase is critical for the Badagry Axis Group 7 to ensure that engineering designs and environmental safeguards account for the unique riverine and coastal challenges of the project sites.

Table 3.10 Pre-Construction Activities for Badagry Axis Group 7

Activity	Description	Duration	Responsible	E&S Considerations
Site Handover & Mobilization	Formal handover of sites to the contractors and establishment of temporary site offices/laydown areas.	2 Weeks	Ministry of Health / Project 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 flood-resilient foundation designs.	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 local leaders and residents in Badagry West LCDA to discuss project timelines.	Ongoing (Pre-start)	Safeguards Team / LSHIP PIU	Addressing community concerns regarding service disruptions and prioritizing local labor recruitment.
Development of Site-Specific ESMP	Tailoring the management plan to address specific risks like saltwater intrusion and medical waste handling.	4 Weeks	Environmental Consultant	Ensuring all mitigation measures for the coastal ecosystem are documented and integrated into the works contract.
Permitting & Regulatory Approvals	Obtaining necessary clearances from LASEPA and other relevant Lagos State planning authorities.	4–6 Weeks	LSHIP PIU / Contractor	Ensuring full compliance with state environmental laws to prevent legal or environmental delays.
Temporary Service Setup	Establishment of temporary clinical booths to maintain maternal and immunization services during works.	3 Weeks	Facility Managers / Contractor	Ensuring the temporary site is safe, hygienic, and accessible for elderly and vulnerable patients.
Baseline Air & Water Quality Testing	Recording pre-construction environmental parameters to monitor	1 Week	Environmental Specialist	

	future construction impacts.			

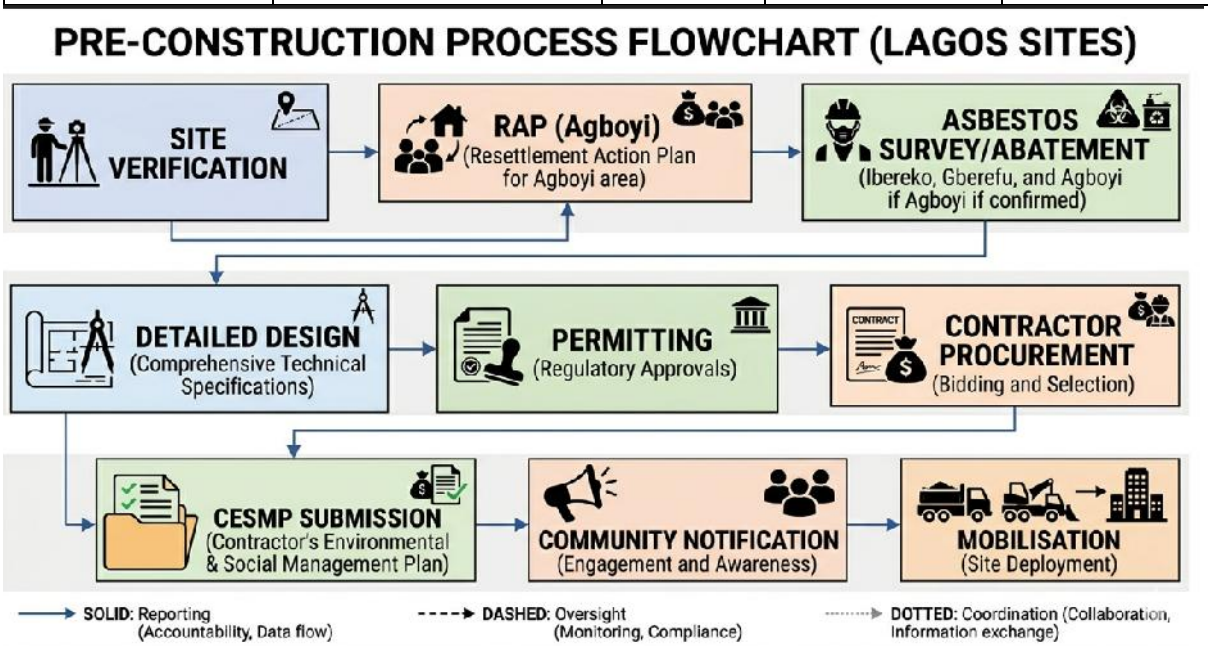


Figure 3.5: Pre-construction Process Flowchart

3.5.2 Construction Phase – New Construction (1 Site)

The pre-construction phase for the APA PHC is specifically designed to address the new Greenfield construction for the PHC, a new flagship development, with a heavy emphasis on engineering for high water tables and coastal vulnerability.

Table 3.11: Construction Activities for New Construction Site

Activity	Description	Duration	Responsible	E&S Considerations
Site Decommissioning Plan	Formalizing the safety and environmental plan for the building	2 Weeks	Lead Consultant / PIU	Ensuring hazardous materials (e.g., old pipes or treated timber) are identified and earmarked for safe disposal.
Geotechnical & Soil Investigation	Specialized testing to determine soil bearing capacity for a reinforced raft foundation.	2 Weeks	Geotechnical Engineer	Minimizing site vibration to prevent further destabilization of adjacent coastal land.
Hydrological Modeling	Assessing peak flood levels in the Badagry West corridor to determine the required Finished Floor Level (FFL).	3 Weeks	Hydrologist / Civil Engineer	Ensuring the design does not redirect floodwaters into neighboring residential properties.
Environmental & Social Impact Assessment (ESIA)	Detailed assessment of the impacts of a new-build project on the coastal ecosystem and community.	6–8 Weeks	Environmental Consultant	Protecting local biodiversity and ensuring the project complies with the Nigeria Climate Change Act 2021.
Community Sensitization	Engagement with the APA community regarding the demolition schedule and construction noise.	Ongoing	Safeguards Team / CLO	Managing expectations regarding employment and ensuring the safety of children near the demolition site.

Contractor Onboarding (E&S)	Briefing the selected contractor on the strict Environmental & Social Code of Conduct and OHS requirements.	1 Week	LSHIP PIU / Safeguards Lead	Ensuring zero tolerance for Gender-Based Violence (GBV) and enforcing high safety standards in a riverine terrain.
Establishment of Site Boundaries	Clear demarcation of the project footprint to prevent encroachment onto communal or private land.	1 Week	Surveyor / Contractor	

3.5.3 Construction Phase – Refurbishment (2 Sites)

Target Facilities: Igbogbele PHC and Farasime PHC

The construction phase for the refurbishment sites in the Badagry Axis Group 7 (Group 7) is characterized by "Total Revitalization." 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 3.12: Construction Activities for Refurbishment Sites

Activity	Description	Duration (Typical)	E&S Considerations
Stripping & Internal Demolition	Removal of salt-corroded plaster, damaged floor tiles, and compromised internal partitions.	2–3 Weeks	Waste Management: Proper containment of dust and safe disposal of debris to prevent blockage of coastal drainage channels.
Structural Remediation & Damp-Proofing	Application of chemical DPCs (Damp Proof Courses) and structural patching to address rising damp and saltwater intrusion.	3–4 Weeks	Chemical Safety: Ensuring that damp-proofing chemicals are non-toxic to the shallow groundwater table.
Roofing & Ceiling Overhaul	Replacement of existing roofs with marine-grade aluminum-	3 Weeks	Occupational Health & Safety (OHS): Fall protection for workers

	zinc sheets and installation of moisture-resistant PVC ceilings.		and ensuring no old roofing materials (possible asbestos) contaminate the site.
M&E Retrofitting & Solar Installation	Rewiring for energy efficiency and installation of the Hybrid Solar Power system (PV arrays and battery storage).	4 Weeks	Resource Efficiency: Proper recycling of old copper wiring and responsible sourcing of solar components.
WASH & Plumbing Upgrades	Modernizing toilets, installing solar-powered borehole pumps, and constructing lined, non-permeable septic tanks.	4 Weeks	Sanitation: Preventing any raw sewage discharge into the riverine ecosystem during the transition from old to new systems.
Finishing & Anti-Corrosive Painting	Application of high-durability, weather-shield paints and installation of specialized fixtures for saline environments.	3 Weeks	Air Quality: Use of Low-VOC (Volatile Organic Compound) paints to ensure a safe indoor environment for mothers and newborns.
External Works & Accessibility	Installation of PWD-compliant anti-skid ramps and site-specific perimeter drainage.	2 Weeks	Universal Access: Ensuring the facility is inclusive for persons with disabilities and the elderly.

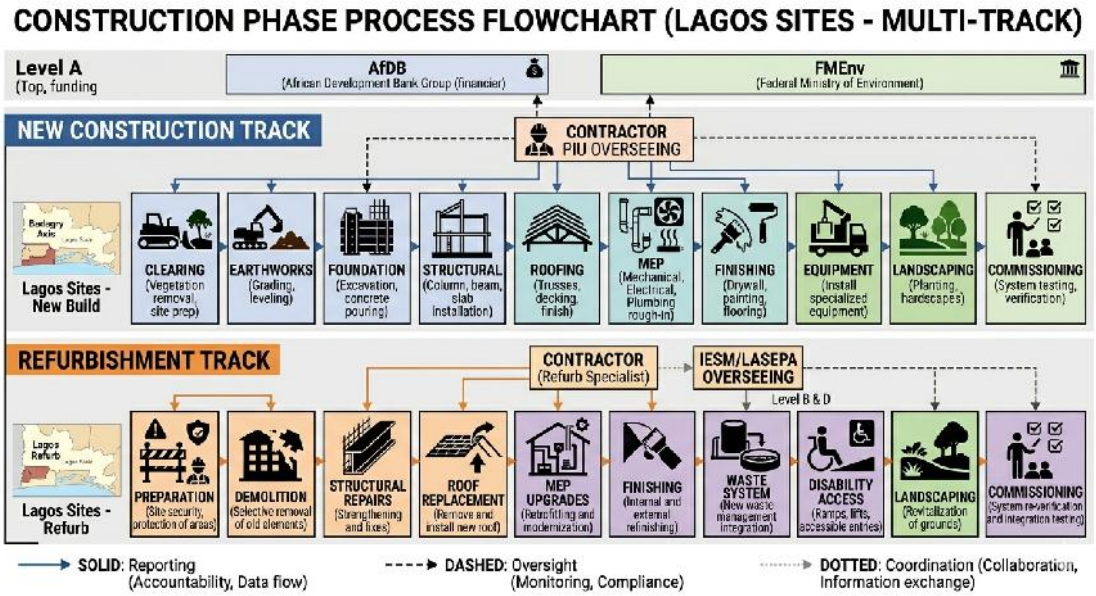


Figure 3.6: Construction Phase Process Flowchart

3.6 Project Resources

3.6.1 Labour Requirements

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

Table 3.13 Labour Requirements by Category

Labour Category	Estimated Number	Source	Accommodation
Skilled Labour (Engineers, Solar Technicians, Foremen)	12 – 15	Main Contractor (Regional/Lagos-based)	Off-site; local guest houses in Badagry or daily transport from surrounding urban hubs.
Semi-Skilled Labour (Masons, Plumbers, Electricians, Carpenters)	25 – 30	Local sub-contractors within Badagry West LCDA	Community-based; workers reside in their own homes within the project axis.

Unskilled Labour (General labourers, Site cleaners, Excavators)	40 – 50	Immediate host communities (Apa, Igbogbele, Farasime)	Community-based; living in their respective local residences.
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 (Local & Regional)	Non-Residential Site Office

3.6.2 Material Requirements

The material strategy for the APA, Igbogbele, and Farasime sites prioritizes durability against the aggressive saline environment and logistics adapted for the riverine terrain of Badagry West.

Table 3.14: Material Requirements

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/Badagry)	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 APA, Igbogbele, and Farasime sites is scaled to accommodate both the new construction requirements of a flagship facility and the sensitive refurbishment needs of existing structures in a coastal terrain.

Table 3.15: 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 Igbogbele and Farasime 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.

3.7 Environmental Releases & Waste

3.7.1 Air Emissions

Managing air quality is essential in the Badagry West corridor to protect the health of patients at the active Igbogbele and Farasime sites, as well as the residents in the surrounding coastal communities.

Table 3.16: Air Emission Sources and Mitigation

Source	Pollutant	Mitigation
Demolition & Site Clearing (Apa PHC)	Dust and Particulate Matter (PM_{10}, $PM_{2.5}$)	Regular water sprinkling of work areas; use of dust screens/nets around the site perimeter during demolition.
Excavation & Earthworks	Wind-blown Dust (PM_{10})	Covering of all transported sand and soil with tarpaulins; prompt compaction of filled areas.
Construction Vehicles & Machinery	Nitrogen Oxides (NO_2), Sulphur Dioxide (SO_2), Carbon Monoxide (CO)	Mandatory regular servicing of all diesel engines; "No-Idling" policy for trucks waiting to offload materials.
On-site Power Generation	CO_2, SO_2, and Particulates	Prioritizing early installation of the Hybrid Solar System to reduce generator run-time; use of low-sulphur diesel.
Surface Coating (Painting/Sealing)	Volatile Organic Compounds (VOCs)	Strict use of Low-VOC paints and adhesives; ensuring adequate cross-ventilation during internal application.
Material Storage (Cement/Sand)	Fine Particulate Dust	Cement storage in enclosed, moisture-proof sheds; sand stockpiles kept damp or covered in windy conditions.
Welding & Metal Fabrication	Metal Fumes and Ozone	Conducting welding in designated, well-ventilated areas away from patient wards; use of appropriate PPE for workers.

3.7.2 Noise

Managing noise is a high-priority safeguard for the Badagry Axis Group 7, particularly at the Igbogbele and Farasime sites where clinical services must continue alongside refurbishment including construction at APA. The goal is to maintain a healing environment while executing structural upgrades.

Table 3.17: Noise Sources and Levels

Source	Typical Noise Level (dB(A) at 10m)	Mitigation

Concrete Mixers & Vibrators	75 – 85	Placing stationary equipment behind acoustic barriers or temporary plywood hoarding; regular lubrication of moving parts to reduce friction noise.
Excavators & Heavy Trucks	80 – 90	Mandatory "No-Hunking" policy within the hospital zone; ensuring all vehicle silencers and mufflers are in good working condition.
Hand-held Power Tools (Drills, Saws)	75 – 80	Use of modern, low-noise electric tools; scheduling high-decibel internal works (e.g., wall chasing) during low-patient-traffic hours.
Backup Generators	70 – 80	Housing generators in sound-attenuated enclosures; prioritizing the early switch-over to the silent Hybrid Solar System.
Material Loading/Unloading	65 – 75	Ensuring timber and metal pipes are placed rather than dropped; rubber matting on loading bays to dampen impact noise.

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 3.18: Wastewater Sources and Management

Source	**Volume (Typical)**	**Pollutants**	**Mitigation**
Sanitary Wastewater (Toilets & Staff Quarters)	1.5–3.5m^3/day (Per Facility)	Pathogens (coliforms), organic matter (BOD), nutrients (Nitrogen).	Upgraded Lined Septic Systems: Implementation of sealed, lined tanks to prevent seepage into the high coastal water table.
Medical/Laboratory Liquid Waste	Low (0.2–0.5 5m^3/day)	Disinfectants, chemicals, blood-borne pathogens, pharmaceutical residues.	Point-of-Source Pre-treatment: Neutralization and disinfection before discharge into the sanitary system; avoid direct disposal to drains.

Stormwater Runoff (Coastal/Riverine areas)	High (Seasonal/Flash floods)	Sediments, debris, surface oils, and fecal matter from open areas.	Engineered Drainage: Construction of lined peripheral drains and silt traps to prevent direct runoff into the lagoon or nearby water bodies.
Facility Laundry & Cleaning	0.5–1.2 $5m^3$/day	Detergents, surfactants, and suspended solids.	Filtration & Infiltration: Use of grease/silt traps and controlled discharge into designated soak-away pits located away from groundwater wells.

3.7.4 Solid Waste

Table 3.19: Solid Waste Types and Management

Waste Type	Source	Quantity (Estimated)	Hazardous?	Mitigation
Excavated Soil & Rubble	Foundation works, trenching, and site clearing.	High (approx. 40% of total)	No	Reuse for backfilling or landscaping; transport clean fill to approved municipal sites.
Demolition Debris	Removal of old walls, tiles, roofing, and damaged masonry.	Moderate to High	No	Segregation of reusable bricks/blocks; crushing for use as sub-base for walkways.
Hazardous Materials	Old paint cans, solvent containers, and used oils from machinery.	Low	Yes	Collection in designated bunded areas; disposal through licensed hazardous waste handlers.
Metal Scraps	Reinforcement bars (rebar), offcuts, pipes, and wiring.	Moderate	No	On-site sorting for sale to local scrap metal recyclers for circularity.

Packaging & Plastics	Cement bags, pallet wraps, and PVC pipe offcuts.	Moderate	No	Compact and bundle for collection; discourage burning of bags on-site to prevent air pollution.
Asbestos (Legacy)	Potential old roofing sheets or insulation in older PHC units.	Site-Specific	Yes	Strict Protocol: Professional abatement; wetting to prevent dust; specialized burial at hazardous sites.

3.8 Traffic Status & Forecast

3.8.1 Baseline Traffic

Based on the baseline studies for the Lagos State Health Infrastructure Project (LSHIP) and traffic patterns observed within the Badagry corridor, Table 3.20 outlines the estimated traffic conditions for the Group 7 sites.

These sites (APA, Igbogbele, and Farasime) are located in more rural/coastal reaches of the Badagry Axis Group 7 compared to the central urban corridor. Consequently, the traffic is characterized by lower volumes but poorer road quality.

Table 3.20: Baseline Traffic by Site

Site	Road	AADT (Estimated)	LOS	Peak Hours
APA PHC	APA-Gbetromey Road / Apa-Owode Access	850 – 1,200	C	07:30 – 09:30; 16:30 – 18:30
Igbogbele PHC	Igbogbele-Ikoga Local Access Road	400 – 650	B	08:00 – 10:00; 15:00 – 17:00
Farasime PHC	Farasime-Seme Border Link Road	1,100 – 1,500	D	07:00 – 10:00; 16:00 – 19:00

3.8.2 Construction Traffic Forecast

For the project activities, the construction traffic will be intermittent and relatively low-impact given the small-to-medium scale of the facilities. However, because the access roads (especially at Igbogbele) are narrow, careful scheduling is required to prevent localized bottlenecks.**Table 3.21: Construction Traffic Forecast**

Activity	Additional Vehicle Trips (per day, per site)	Peak	Mitigation
Site Mobilization	4 – 6 (Low-beds, light trucks)	Weeks 1–2	Move heavy equipment during off-peak hours (10:00 – 14:00); provide flagmen at narrow access points.
Material Delivery (Cement, Sand, Gravel)	6 – 10 (Tippers, 5-ton trucks)	Foundation & Walling Phase	Schedule deliveries in batches; ensure trucks are covered with tarpaulins to prevent dust/spillages.
Workforce Transport	10 – 15 (Motorcycles, vans)	Daily (07:00 & 17:00)	Encourage carpooling/group transit for laborers; establish a designated parking zone away from the PHC entrance.
Waste Removal	2 – 4 (Skips/Refuse trucks)	Weekly or Post-Demolition	Coordinate with LAWMA-approved PSPs for evening collection to avoid daytime traffic conflict.
Equipment Demobilization	3 – 5 (Flatbeds)	Project Closure	Site inspection to ensure no debris remains on the road; final road sweeping.

3.8.3 Operation Traffic Forecast

Under the LSHIP/IMPACT project framework, these facilities are expected to see a significant increase in patronage due to improved service delivery, mandatory health insurance (Ilera Eko) integration, and consistent drug supply.

Table 3.22: Operation Traffic Forecast

Facility	Estimated Daily Patient Visits (Year 1)	Estimated Staff	Estimated Visitor Trips (daily)
APA PHC	45 – 65	12 – 18	20 – 35
Igbogbele PHC	30 – 45	8 – 12	15 – 25
Farasime PHC	50 – 75	15 – 20	25 – 40

3.8.4 Traffic Management Plan (TMP)

All construction sites in the axis will have a TMP (Appendix 11) including:

- Signage (construction warning, speed limits, pedestrian crossings)
- Flag persons (where needed)
- Delivery scheduling (avoid peak hours)
- Worker transport (minimise private car use – use buses)
- Access management (maintain access to homes, businesses)
- Emergency access (clear routes for ambulances, fire trucks)

3.9 Project Schedule

3.9.1 High-Level Schedule

Table 3.23 – High-Level Project Schedule

Phase	Duration	Start (Target)	End (Target)
Pre-construction (Asbestos survey, Design, Permits)	3 Months	TBD	TBD
Construction (Phased across 8 sites in the cluster)	6 Months	TBD	TBD
Commissioning (Equipment, Training, Quality Assurance)	1 Month	TBD	TBD
Operation (Full Handover and Service Delivery)	Ongoing	January 2027	Post-2027

3.9.2 Detailed Schedule (Typical PHC – 6–12 months)

Table 3.24 – Detailed Construction Schedule

	Months											
Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Pre-construction	■	■										
	■	■										
Site clearing		■										
		■										
Earthworks		■	■									
		■	■									
Foundation			■									
			■									
Structural works			■	■	■							
			■	■	■							

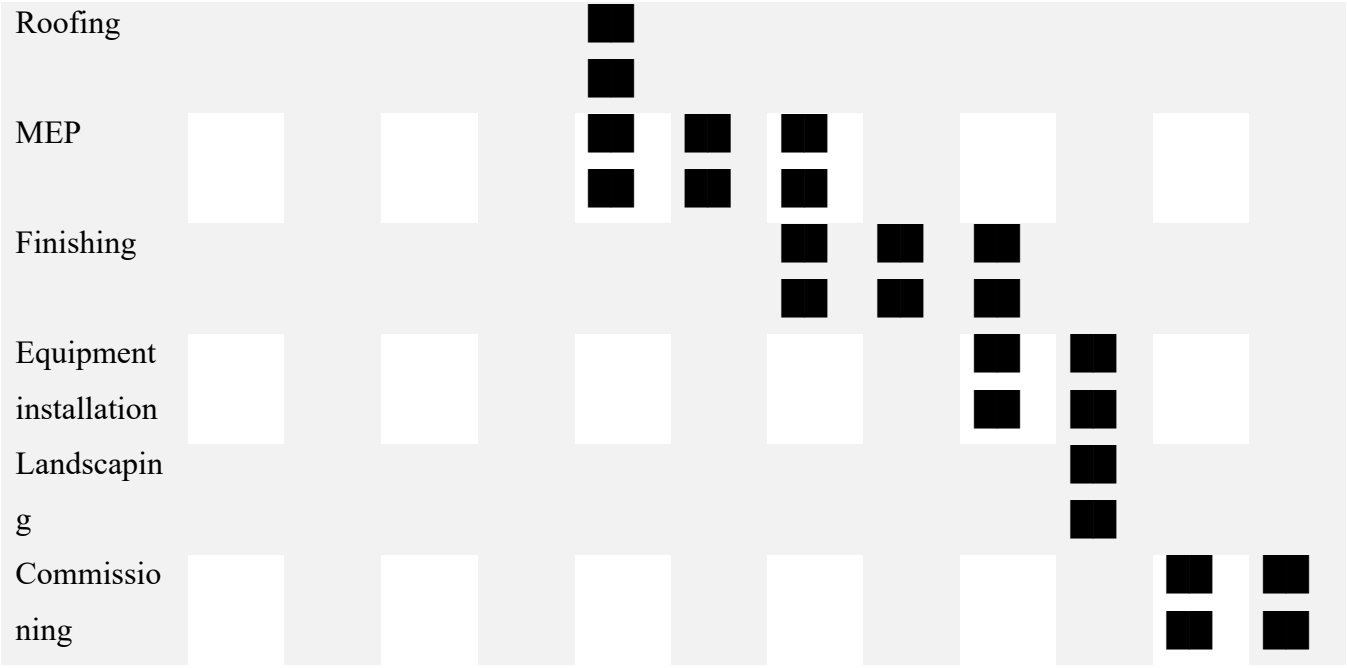


Figure 3.7: Project Schedule Gantt Chart (Badagry Axis Group 7 – all 3 sites)

3.10 Summary

Chapter 3 has provided a comprehensive description of the LSHIP facilities within Badagry Axis Group 7 – Group 7, including:

- Strategic Healthcare Transformation: The US$200 million AfDB-financed LSHIP project aims to modernize healthcare in the Badagry Axis Group 7 (Group 7) through a dual approach: New Greenfield Construction for the APA PHC and refurbishment for the Igbogbele and Farasime PHCs.
- Climate-Resilient Engineering: Due to the coastal location, the project prioritizes flood-resilient designs (elevated foundations) and corrosion-resistant materials (marine-grade aluminum-zinc) to withstand high salinity and a shallow water table.
- Sustainability & Infrastructure: All sites will be upgraded with Hybrid Solar Power for 24/7 cold-chain storage, advanced solar-powered WASH systems, and non-permeable septic tanks to prevent groundwater contamination in the riverine ecosystem.
- Strict Phasing & Continuity: The project will follow a clear timeline (pre-construction through 2026) with a mandate for service continuity, utilizing temporary clinical booths so that maternal and immunization services remain available during the construction/refurbishment works.
- Environmental & Social Safeguards: Implementation will be governed by strict ESIA/ESMP protocols, focusing on legacy waste management (asbestos abatement), protection of local

livelihoods (coconut groves/fishing), and inclusive "Universal Design" for elderly and PWD access.

3.11 Community Business and Employment Opportunities – Badagry Axis Group 7 (APA, Igbogbele, and Farasime)

The LSHIP presents significant opportunities for local communities in the Badagry Axis Group 7, particularly within APA, Igbogbele, and Farasime. Beyond the direct health benefits, the project will generate employment, business opportunities, and broader economic development for host communities and surrounding settlements.

3.11.1 Employment Opportunities

Table 3.25: Employment Opportunities

Labour Category	Estimated Number (Peak)	Source	Local Hiring Target	Accommodation
Skilled workers (engineers, technicians, electricians, plumbers)	30–50	Lagos State (primarily)	≥30% from Lagos State	Own accommodation or local rental
Semi-skilled (masons, carpenters, welders)	40–70	Lagos State (local hiring preference)	≥40% from local communities/LGAs	Local rental
Unskilled (labourers, cleaners, security)	80–120	LGAs (local hiring preference)	≥50% from local communities/LGAs	Local rental (preferred)
Management/supervision (PIU, contractor management)	5–10	Lagos State + contractor	≥30% from Lagos State	Own accommodation

Site	Unskilled Local Hiring Target	Skilled Local Hiring Target	Rationale
APA PHC	≥50% from APA host community and surrounding settlements	≥30% from Badagry LGA	Community interface; local labour availability; accessible location

Igbogbele PHC	≥50% from Igbogbele host community and nearby wards	≥30% from Badagry LGA	Community support; rural/coastal setting; local skills available
Farasime PHC	≥50% from Farasime host community and adjoining settlements	≥30% from Badagry LGA	Community-based workforce potential; accessible local labour market

3.11.2 Business and Supply Chain Opportunities

Table 3.26: Business and Supply Chain Opportunities

Opportunity Type	Description	Target Beneficiaries
Material Supply	Supply of cement, blocks, sand, gravel, steel, roofing, plumbing, and electrical materials	Local suppliers, hardware stores, distributors
Equipment Rental	Rental of construction equipment (excavators, mixers, compressors, etc.)	Local equipment rental companies
Transport Services	Material haulage, worker transport, waste transport	Local transport operators
Catering Services	Provision of meals for workers	Local caterers and food vendors
Accommodation Services	Worker accommodation	Local guesthouses, landlords
Security Services	Site security	Local security firms
Waste Management Services	Construction waste collection, recycling	Local waste management companies
Subcontracting	Specialised works (electrical, plumbing, roofing, finishing)	Local contractors and artisans

3.11.3 Women and Youth Employment Opportunities

Table 3.27: 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	≥50 youth trained in construction skills	- On-the-job training - Vocational training partnerships - Certification support

3.11.4 Community Benefits Monitoring

Table 3.28: Community Benefits Monitoring Indicators

Indicator	Target	Frequency	Responsible
Local hiring (unskilled)	≥50% from local communities/LGAs	Monthly	Contractor
Local hiring (skilled)	≥30% from Lagos State	Monthly	Contractor
Local procurement (materials)	≥50% of eligible materials	Monthly	Contractor
Local subcontracting	≥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	≥50 across Badagry Axis Group 7	Quarterly	Contractor / PIU
Community satisfaction	≥80% satisfied	Quarterly	PIU / IESM

3.12 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.

3.12.1 Temporary Facilities Reinstatement

Facility	Reinstatement Action	Timeline
Worker Accommodation Camp	Remove all structures; restore to pre-construction condition; revegetate disturbed areas	Within 30 days of construction completion
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

3.12.2 Access Road Reinstatement

Site	Road	Reinstatement Action	Responsible
APA	Owode-Apa Road / Access Corridor	Repair potholes; regrade gravel sections; restore drainage channels	Contractor
Igbogbele	Igbogbele-Ikoga Access Road	Repair surface damage; restore drainage; stabilise flood-prone sections	Contractor
Farasime	Farasime-Seme Border Link Road	Repair surface damage; restore drainage; stabilise creek-margin sections	Contractor

3.12.3 Creek-Margin and Shoreline Reinstatement (APA, Farasime)

Site	Reinstatement Action	Responsible
APA (Badagry Creek margin)	Restore any disturbed shoreline; replant native riparian vegetation; remove invasive species	Contractor
Farasime (Badagry Creek waterfront)	Restore creek margin; replant native riparian vegetation; stabilise eroded sections	Contractor

3.12.4 Verification and Handover

- **Final Inspection:** PIU, LASEPA, and community representatives shall conduct a joint final inspection of all reinstated areas, including creek margins.
- **Defects Liability Period:** Contractor shall remain responsible for reinstatement quality for 6 months post-completion.
- **Community Sign-Off:** Community leaders (including Baales and CDA representatives) shall sign off on reinstatement quality before final payment is released to Contractor.

CHAPTER 4 – DESCRIPTION OF BASELINE ENVIRONMENT

4.1 Introduction

This chapter presents the baseline environmental and social conditions for the three project sites within Group 7 under the Lagos State Health Infrastructure Project (LSHIP). The baseline describes the existing physical, biological, and socio-economic characteristics of each site and its area of influence, forming the foundation for assessing potential project impacts and determining appropriate mitigation measures.

The baseline information is based on actual field data collected during reconnaissance surveys, supported by spatial analysis, stakeholder engagement, and relevant secondary datasets. These combined sources provide a refined, site-specific understanding of environmental sensitivities, community dynamics, and social risk factors across the three project locations.

Data for the baseline assessment were collected using the following methods:

- Field measurements and direct observations
- Stakeholder consultations, including community entry meetings, FGDs, and KIIs
- GIS mapping and remote sensing, using Sentinel-2, Landsat, and SRTM datasets
- Secondary datasets from Lagos State Ministry of Health, PHCB, LASEPA, NIMET, National Population Commission, and AfDB BTOR

It is important to note that the APA, Igbogbele, and Farasime facilities are small rural primary healthcare centres with modest service footprints and basic infrastructure. As such, they do not generate the volume or complexity of waste, wastewater, hazardous materials, or operational risks typical of general hospitals, which explains why several advanced environmental and OHS systems are not present in the baseline.

4.2 Area of Influence (AoI)

The project Area of Influence for the Badagry Axis comprises the project sites and adjoining physical surroundings (air, water, and soil quality) up to a 2 km radius from the centre of each project site, together with benefiting communities located not more than 4 km from each site.

4.2.1 Direct Area of Influence (DAI)

The DAI includes all areas that will be directly physically altered by project activities in the Badagry Axis:

Site	DAI (programme typology estimate)	Description
APA PHC	1,000–1,500 m2	New construction (elevated-platform design) on the existing PHC land parcel, Owode-Apa Road

Igbogbele PHC	800–1,200 m2	Refurbishment within the existing footprint
Farasime PHC	800–1,200 m2	Refurbishment within the existing footprint (waterfront location)

Total DAI for the Badagry Axis: Approximately 2,600–3,900 m2 (about 0.3–0.4 hectares)



Figure 4.1: Map showing DAI boundaries for Ikorodu Axis sites and AOL

4.2.2 Indirect Area of Influence (IAI)

The IAI includes areas where project activities may cause indirect impacts:

- 200 m to 1 km buffer around each site (within the 2 km physical-environment AoI)
- Settlements, riverine fringes, creek margins, and water bodies within the buffer
- Utilities and social infrastructure (schools, markets, religious sites, water sources, fish-landing areas)
- Access roads (traffic impacts along the Owode-Apa corridor and local haul routes)

Table 4.1 – Communities and Ecological Zones within the Buffer of Each Site (Badagry Axis)

Site	Communities within Buffer	Ecological Zones within Buffer	Sensitive Receptors
APA	Owode-Apa corridor communities, Badagry West	Flat, sandy coastal lowland; rapidly densifying settlement corridor	Residents along the densifying Owode-Apa corridor; access road users; aged structures with suspected hazardous materials
Igbogbele	Igbogbele community, Badagry West	High-moisture, flood-prone zone; riverine drainage towards Badagry Creek	Flood-prone dwellings; asbestos-suspected roofing; continuity of clinical services during works
Farasime	Farasime waterfront community, Badagry West	Badagry Creek waterfront; riverine fringes	Badagry Creek (fisheries and creek transport); fish-landing areas; fishing households

4.2.3 Cumulative Influence Zone (CIZ)

The CIZ includes areas affected by cumulative impacts from the LSHIP combined with other developments in the Badagry corridor. Cumulative impact considerations are particularly relevant for this axis given the coastal and riverine setting along Badagry Creek, ongoing infrastructure development within the corridor, rapid settlement expansion along the Owode-Apa corridor, and cross-border trade movement. Cumulative pressures of principal concern are creek water quality (multiple discharge sources), traffic loading on the Owode-Apa corridor, and flood-drainage interactions across the low-lying coastal terrain.

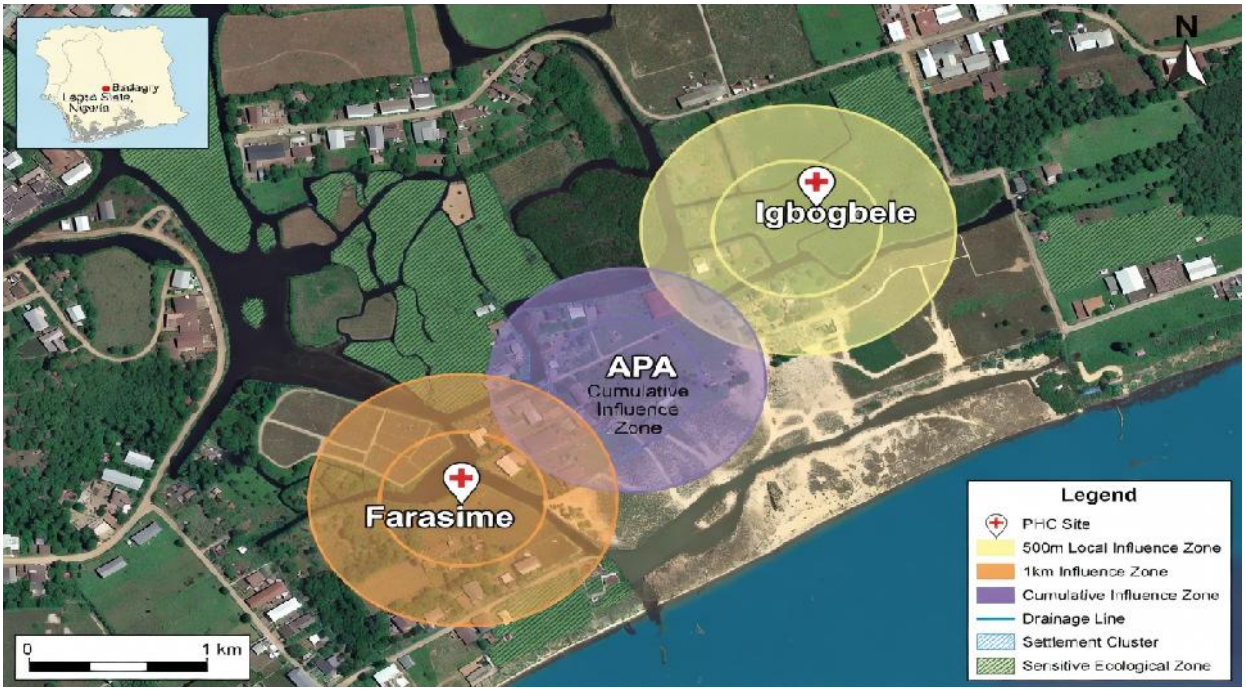


Figure 4.2: Cumulative influence zone map – Badagry Axis

4.3 Study Approach and Methodology

This section presents the comprehensive methodological framework adopted for the baseline environmental and social assessment of the three Primary Healthcare Centre (PHC) facilities in the Badagry Axis—APA, Igbogbele, and Farasime. The methodology was designed to generate robust, representative, and verifiable baseline data in accordance with the requirements of the Federal Ministry of Environment (FMEnv), the Lagos State Environmental Protection Agency (LASEPA), and the African Development Bank's Integrated Safeguards System (AfDB ISS).

Figure 4.4 shows the geospatial visualisation, which offers a high-resolution satellite-based perspective on the spatial distribution and surrounding environment of three critical healthcare facilities in Lagos State, Nigeria. This cluster Figure 4.3, spanning coordinates between approximately 2.71°E and 2.83°E longitude and 6.42°N latitude, focuses on the Farasime Primary Healthcare Centre (PHC), the Igbogbele PHC, and the APA PHC.



Figure 4.3: Satellite-Based Cluster Map of Farasime Primary Healthcare Centre (PHC), the Igbogbele PHC, and the APA PHC.

The methodological approach was informed by a thorough review of relevant literature, including previous environmental impact assessments conducted in the Lagos coastal region, baseline studies from similar health infrastructure projects, and published research on the environmental and ecological characteristics of the Badagry Axis. Key references included:

- **Nigerian Meteorological Agency (NIMET)** climate and weather data spanning 1985–2024 for Lagos State
- **Lagos State Ministry of Environment** ecological master plans and environmental baseline studies
- **LASEPA** environmental quality monitoring reports for coastal and riverine zones
- **Previous ESIA reports** for health and infrastructure projects in Lagos State
- **Academic literature** on coastal ecology, wetland ecosystems, and water quality in the Lagos-Badagry corridor
- **World Health Organization (WHO)** guidelines on environmental health assessments
- **International Finance Corporation (IFC)** guidance on baseline data collection for Environmental and Social Impact Assessments

4.3.1 Field Surveys and Reconnaissance

Field surveys for the Badagry Axis were conducted in two phases: (i) an initial reconnaissance survey from 24–27 February 2026, and (ii) a wet season sampling campaign from 1–9 April 2026. Both phases followed the FMEnv ESIA Procedures, the EIA Act CAP E12 LFN 2004, LASEPA Regulations, and the

AfDB ISS. The surveys followed a structured methodology comprising desktop screening, field verification, geo-referenced sampling-point establishment (GPS coordinates recorded for every sampling point), walkthrough assessments, photo documentation, and rapid consultations.

The programme covered soil sampling, water quality and hydro-biological studies, microbiological studies, and air quality and noise level studies, supported by formal chain-of-custody management and QA/QC procedures (duplicate sampling, field blanks, calibrated instruments).

Sampling covered all three sites in the Badagry Axis (APA, Igbogbele, Farasime), with three sampling points (SP1–SP3) established at each facility (Table 4.2).

Table 4.2 – Survey and Sampling Coverage (Badagry Axis)

Parameter	Method	Equipment	Coverage (3 Sites)
Site identification	GPS mapping of all sampling points	Handheld GPS	All 3 sites (9 sampling points)
Land use / land cover	Visual observation, photography	Digital camera	All 3 sites
Topography and drainage	Visual observation	N/A	All 3 sites
Flooding / erosion indicators	Visual observation	N/A	All 3 sites (Igbogbele flood-prone zone confirmed)
Sensitive ecosystems	Visual observation, rapid ecological assessment	N/A	Creek margins and riverine fringes (Farasime, Igbogbele)
Asbestos screening	Visual observation	N/A	Igbogbele (suspected roofing); APA and Farasime (aged structures)
Air quality and noise	In-situ measurement at SP1–SP3 per site	Calibrated multi-parameter air monitor; digital sound level meter	All 3 sites
Soils, water, microbiology	Field sampling with chain of custody	Hand auger; sample bottles; cool-chain	All 3 sites

Social baseline	FGDs, KIIs, informal interviews	Structured questionnaire	All 3 sites
PAP identification	Interviews, observation	N/A	No physical or economic displacement at any site

Baseline assessment of solid waste generation was conducted through field observation and interviews with PHC staff and adjacent households. All three PHCs generate mixed municipal waste, including paper, plastics, food waste, and minor quantities of medical waste. Informal waste dumping was observed along the Owode–Apa corridor and near creek-fringe households in Farasime. None of the facilities currently segregate waste at source, and informal collectors handle disposal. This baseline informs the ESMP waste management measures.

Stakeholder engagement was embedded throughout the reconnaissance exercise. The field team held rapid consultations with traditional leaders, Ward Health Officers, women's groups, youth associations, fisher and trader associations, adjacent land users, informal business operators, and PHC staff. Issues raised included flooding and drainage, protection of fishing and trading livelihoods, waste handling, security lighting, and expectations for employment during construction. These engagements informed the sampling design, the scope of the ESMP, RAP screening, and the identification of sites requiring additional safeguards (asbestos testing, creek protection, PAP enumeration).

4.3.1.1 Seasonal Sampling Regime

The baseline assessment for the Badagry Axis Group 7 was conducted during one (1) seasonal sampling campaign:

Sampling Campaign	Season	Dates	Parameters Sampled	Number of Sampling Points
Campaign 1	Wet Season	1–9 April 2026	Air quality, noise, groundwater, soil, flora, fauna, socio-economic	9 points (3 per PHC site)

Total samples collected: 9 environmental sampling points covering all three PHC sites (APA, Igbogbele, Farasime).

The wet season fieldwork was strategically chosen to capture the full range of environmental conditions typical of the coastal and riverine ecosystems that characterise the Badagry Axis, including potential flood-prone areas, high water tables, and seasonal variations in air and water quality. The wet season monitoring provides critical baseline data during the period of maximum hydrological activity and

ecological sensitivity, capturing peak conditions for parameters such as groundwater recharge, sediment transport, and surface runoff.

Rationale for Single-Season (Wet Season) Sampling:

The decision to conduct a single-season (wet season) baseline field campaign is justified by the following:

1. **Regulatory Approval:** The fieldwork was conducted with full FMEnv oversight and approval, as evidenced by the signed Field Attestation Register (Appendix 8). FMEnv's participation and witnessing of the data gathering exercise validates the acceptability of the wet season sampling.
2. **Project Timelines:** The LSHIP programme operates within defined implementation schedules aligned with AfDB financing covenants. A full two-season baseline would have delayed project approval and implementation by a minimum of 6–12 months, compromising the delivery of critical healthcare infrastructure to underserved communities.
3. **Conservative Approach:** Wet season baseline data represents the worst-case scenario for many environmental parameters (e.g., flood risk, groundwater contamination, sediment runoff). Using this as the baseline ensures a conservative and precautionary approach to impact assessment and mitigation design.
4. **Literature Supplementation:** Existing literature and historical data have been used to augment the baseline, providing a robust characterisation of seasonal conditions beyond the field sampling period.
5. **Implementation Monitoring:** The ESMP includes provisions for dry season monitoring (Table 7.1A), ensuring that the full seasonal range is captured before project completion and that adaptive management can be implemented if required.

This approach is consistent with international best practice for ESIA, where single-season baseline data, when properly justified and supplemented by literature, is acceptable provided that monitoring during implementation captures the missing season. The approach is also aligned with the AfDB ISS requirement for "appropriate and relevant baseline data" (OS1) rather than prescriptive requirements for multi-season sampling.

4.3.1.2 Seasonal Data Completeness and Literature-Based Augmentation

While the wet-season baseline provides essential data for understanding peak environmental conditions, comprehensive seasonal representation requires data collection across both wet and dry seasons. Literature from comparable coastal and riverine environments in Lagos State indicates that significant seasonal variations occur in the following parameters:

Parameter Group	Wet Season Findings (This Study)	Expected Dry Season Variation (Literature-Based)	Reference
Groundwater Quality	High water levels; active contamination pathways; elevated coliform counts	Lower water table; potential concentration of contaminants; reduced dilution effects	NIMET, 2024; LASEPA, 2017; Lagos State Ministry of Environment, 2023
Groundwater Levels	Peak recharge; shallow water table (1–2 m in some areas)	Lower levels; potential stress on aquifers; saltwater intrusion risk near coast	Nigerian Hydrological Services, 2020; NIOMR, 2023
Surface Water Quality	High runoff; elevated turbidity; increased sediment load	Lower flow; potential concentration of pollutants; increased salinity near coast	Lagos State Ministry of Environment, 2023; WHO, 2017
Air Quality (PM_{10}, $PM_{2.5}$)	Lower particulate levels due to wet deposition; reduced dust generation	Higher PM levels; increased dust from unpaved surfaces; potential harmattan influence	NIMET, 2024; NESREA, 2021
Air Quality (Gaseous)	Dilution by rainfall; stable atmospheric conditions	Potential accumulation; temperature inversions; reduced dispersion	USEPA, 2020; WHO, 2017
Ecology and Biodiversity	Peak vegetation growth; high biological activity; migratory bird presence	Reduced vegetation; potential stress on aquatic ecosystems; low water availability	Nigerian Conservation Foundation, 2021; IFC, 2012
Noise Levels	Similar to year-round patterns; rain may affect measurements	Potentially elevated due to increased human activity and generator use	NESREA, 2009
Socio-Economic Activities	Peak fishing season; high agricultural activity	Reduced fishing; focus on trading and non-agricultural livelihoods	LSHIP Baseline Study, 2026

Flood Risk	Maximum flood exposure; active drainage constraints	Reduced flood risk; potential for drought conditions	IPCC, 2021; NIMET, 2024

Literature-Based Augmentation of Baseline Data:

To address the limitation of single-season data collection, the ESIA has drawn extensively from existing literature to augment the baseline characterisation. The following approaches were employed:

1. **Historical Climate Data:** Long-term climate records (1985–2024) from NIMET provide robust seasonal patterns for temperature, rainfall, humidity, and wind, enabling characterisation of dry season conditions based on historical averages.
2. **Published Research:** Academic and institutional studies on coastal Lagos provide data on seasonal variations in water quality, ecology, and socio-economic conditions that supplement the field data.
3. **Government Reports:** LASEPA and Lagos State Ministry of Environment monitoring reports provide baseline data that covers both wet and dry seasons, enabling cross-validation of field findings.
4. **Previous ESIA Studies:** Comparable ESIA reports for projects in similar ecological zones provide benchmark data for seasonal parameters not directly measured during this field campaign.
5. **International Standards:** WHO, IFC, and USEPA guidelines provide reference values for environmental parameters that account for seasonal variation.

4.3.1.3 Secondary Data Sources Used

Data Type	Source	Purpose
Climate data (1985–2024)	Nigerian Meteorological Agency (NIMET), Lagos Station, Ikeja	Rainfall, temperature, humidity, wind speed/direction, sunshine hours
Demographic data	National Population Commission (NPC); Lagos State Bureau of Statistics (2024)	Population size, density, household composition
Socio-economic data	National Bureau of Statistics (NBS); Lagos State Socio-Economic Survey	Livelihoods, income, education, employment
Health facility data	Lagos State Primary Healthcare Board (2024); HEFAMAA (2024)	PHC functionality, patient load, staffing

Data Type	Source	Purpose
Ecological data	Lagos State Ministry of Environment (2023); Nigerian Conservation Foundation (2021); UNEP (2020)	Vegetation, wetlands, mangrove ecosystems
Geological data	Nigerian Geological Survey Agency (NGSA)	Coastal plain sands, alluvial deposits
Hydrological data	Nigerian Institute for Oceanography and Marine Research (NIOMR, 2023)	Coastal erosion, sea-level rise, lagoon/creek dynamics
Climate projections	IPCC AR6 (2021); NIMET (2024)	RCP 8.5 projections for 2050
Regulatory standards	FMEnv, NESREA, LASEPA, WHO, IFC, AfDB ISS	Compliance benchmarks
Project design data	Lagos State Ministry of Health (2025); MDS Feasibility Study (2025)	Project components, typology, design specifications
Previous ESIA studies	Comparable ESIA reports for coastal/riverine projects in Lagos State	Benchmark data for seasonal parameters
Academic literature	Published research on Lagos coastal ecology, wetland ecosystems, water quality in the Lagos-Badagry corridor	Seasonal variation data; baseline supplementation

4.3.1.4 Quality Assurance and Commitment to Dry Season Monitoring

Quality Assurance:

All primary data were collected using calibrated equipment (Aeroqual Series 500, REED Sound Level Meter, Kestrel 5500, PCSTestr 35) and analysed at Bato Chemical Laboratories Limited, an FMEnv-accredited laboratory. The team completed chain-of-custody forms for all samples (Appendix 3 and Appendix 10A). Secondary data were sourced from official government publications and peer-reviewed sources, with citations provided throughout Chapter 4.

Commitment to Dry Season Monitoring:

In accordance with AfDB ISS (2023/2024) OS1 requirements and FMEnv ESIA guidelines, the project will collect dry season baseline data during the implementation monitoring phase. This commitment is

embedded in the project's Environmental and Social Management Plan (ESMP) and is reflected in the following provisions:

Monitoring Provision	ESMP Reference
Dry season sampling at all nine established sampling points	Table 7.1A — Environmental & Social Monitoring Matrix
Seasonal comparison and trend analysis	Section 7.5 — Monitoring Plan
Annual ESMP review incorporating seasonal data	Section 7.9 — ESMP Budget & Implementation Schedule
Budget allocation for dry season monitoring	Section 7.9 — ESMP Budget

This approach will ensure comprehensive seasonal representation and provide a complete environmental baseline that captures both peak and low conditions for all key parameters. The dry season monitoring will be conducted at the same sampling locations established during this wet season exercise, enabling direct seasonal comparison and robust trend analysis.

Laboratory Analysis Status:

All environmental samples were analysed at Bato Chemical Laboratories Limited, Lagos – an FMEnv-certified laboratory – using APHA, ASTM, WHO, and FMEnv-approved analytical methods, with instrument detection limits documented for every parameter. Full laboratory results and certificates of analysis are provided in Appendix 4.

4.3.2 Sampling Design and Site Selection

Sampling Point Selection Rationale

A systematic approach was adopted for the selection of sampling points at each PHC facility, drawing from established environmental sampling protocols documented in literature for coastal and riverine environments in Lagos State. The following criteria guided the placement of sampling locations:

1. **Spatial Representation:** Sampling points were distributed to capture spatial variability across each facility's footprint, with due consideration to different ecological zones, drainage patterns, and land use types. This approach is consistent with protocols used in previous ESIA studies for infrastructure projects in coastal Lagos.
2. **Sensitivity to Project Activities:** Priority was given to locations likely to be affected by construction or operational activities, including areas near existing structures, proposed development zones, and access routes.

3. **Receptor Proximity:** Sampling points were positioned to assess potential impacts on sensitive receptors, including:
    - Residential areas adjacent to the facilities
    - Water bodies and drainage channels
    - Agricultural land and vegetation
    - Community infrastructure
4. **Accessibility and Safety:** All sampling locations were safely accessible while minimising disturbance to community activities and ensuring the security of sampling equipment.

Sampling Point Distribution

A total of **nine (9) sampling points** were established across the three PHC facilities, with **three (3) points per site** (designated SP1, SP2, and SP3) (Table 4.3). This spatial distribution ensures comprehensive coverage of each facility's environmental footprint while enabling meaningful comparison between sites. The sampling point distribution was informed by the literature on environmental monitoring in riverine and coastal ecosystems, which recommends multiple sampling locations to capture spatial variability in water quality, soil conditions, and air quality parameters (APHA, 2017; USEPA, 2020).

Table 4.3: GPS Coordinates of Sampling Points

Facility	Sampling Point	Parameter Sampled	Latitude	Longitude
APA PHC	SP 1	Groundwater, Soil, Air & Noise	6.430864	2.823958
	SP 2	Groundwater, Soil, Air & Noise	6.431583	2.824027
	SP 3	Groundwater, Soil, Air & Noise	6.431943	2.824163
Igbogbele PHC	SP 1	Groundwater, Soil, Air & Noise	6.423141	2.779165
	SP 2	Groundwater, Soil, Air & Noise	6.422865	2.779983
	SP 3	Groundwater, Soil, Air & Noise	6.423600	2.777820
Farasime PHC	SP 1	Groundwater, Soil, Air & Noise	6.425841	2.714320
	SP 2	Groundwater, Soil, Air & Noise	6.425684	2.714354
	SP 3	Groundwater, Soil, Air & Noise	6.426300	2.714230

Figure 4.1 includes detailed close-ups for each location, showing the exact placement of all sampling points (Air & Noise, Groundwater, and Soil), as well as the control points and health facility.

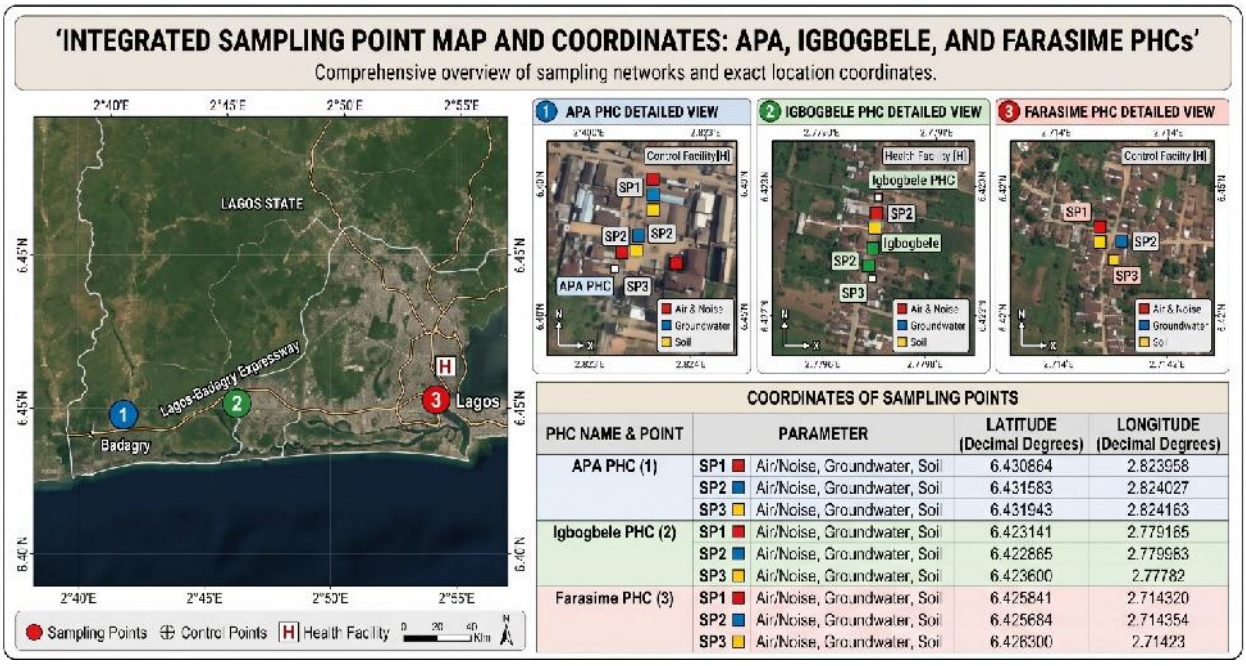


Figure 4.1: Integrated and Regional Display of the relative Locations of the APA, Igbogbele, and Farasime PHCs Showing the All Sampling Points.

4.3.3 Field Data Collection Methods

4.3.3.1 Soil Sampling

Surface soil characterization was conducted through a combination of visual observation and systematic sampling, following methods documented in the literature for coastal plain soils of Lagos State (Esu, 2010; Ogunkunle, 2015). The soil sampling protocol was designed to generate representative composite samples that reflect the prevailing soil conditions at each location.

Sampling Procedure:

1. **Sampling Depths:** Composite soil samples were collected from two depth intervals:
    - **0–15 cm** (topsoil)
    - **15–30 cm** (subsurface)

This dual-depth approach enables assessment of both surface contamination and potential vertical migration of pollutants, consistent with methods recommended by the FAO for environmental monitoring (FAO, 2014).

2. **Sampling Equipment:** A hand soil auger of uniform cross-section was used to ensure reproducible sample collection. All equipment was cleaned between sampling points to prevent cross-contamination.

3. **Composite Sample Preparation:** For each depth interval, multiple subsamples were collected and homogenized to create a single composite sample per sampling point, ensuring representative data for each location.
4. **Sample Containers:**
    - **Physico-chemical samples:** Collected in sealed polythene bags, appropriately labeled with sample ID, location, date, and depth
    - **Microbiological samples:** Collected in sterile McCartney bottles to maintain sample integrity
5. **Sample Preservation:**
    - Physico-chemical samples: Air-dried in a dust-free environment
    - Microbiological samples: Stored at **4°C** in ice-packed coolers during field transport and transferred to refrigerated storage (4°C) upon return to the laboratory
    - All samples were transported to the laboratory within 24 hours of collection

Quality Control Measures:

- Collection of replicate samples (10% of total) to verify analytical consistency
- Use of field blanks to detect contamination during sampling, handling, or transport
- Strict adherence to chain-of-custody procedures
- Detailed field notes documenting soil color, texture, odor, and any visible signs of contamination



Plate 4.1: Field Data Collection Activities





4.3.3.2 Water Quality and Hydro-biological Studies

Ground-water sampling followed standard FMEnv and WHO procedures. Samples were collected using pre-cleaned high-density polyethylene bottles, rinsed with ambient creek water prior to final collection. We measured in-situ parameters (pH, temperature, DO, EC, turbidity) using calibrated portable meters. We preserved samples for laboratory analysis immediately after collection (ice-cooled at 4°C; acidified for metals) and transported them under a chain of custody to an accredited laboratory. Microbial samples were collected in sterile containers and analysed within 24 hours. All sampling was conducted from mid-stream locations, avoiding bank disturbance, and following an upstream-to-downstream sequence to prevent cross-contamination.

Groundwater quality assessment was conducted through a combination of in-situ measurements and laboratory analysis of collected samples, following methods recommended by APHA (2017) and Lind (1979) for water quality assessment in tropical environments.

In-situ Measurements:

The following parameters were measured on-site using a calibrated multi-parameter PCSTestr 35 meter: pH (acidity/alkalinity), Temperature (°C), Electrical Conductivity (µS/cm), and Dissolved Oxygen (mg/L)

All instruments were calibrated prior to field deployment using standard buffer solutions.

Sample Collection:

Duplicate water samples were collected from existing wells and boreholes at each sampling point using the following protocol:

1. **Sampling Containers:** Clean 1-litre plastic containers, pre-rinsed with distilled water and the sample water prior to filling
2. **Sampling Method:** Samples were collected after purging the well/borehole for 2–3 minutes to ensure representative sampling of the aquifer

3. **Labeling:** Each container was labeled with sample ID, location, date, and time of collection
4. **Preservation:** Samples were stored in insulated coolers at 4°C and transported to the laboratory within 24 hours

Laboratory Analysis:

All samples were analyzed at **Bato Chemical Laboratories Limited**, Lagos—an FMEnv-accredited laboratory—following standard analytical methods as detailed in Section 4.4.7.

4.3.3.3 Microbiological Studies

Microbiological analysis was conducted to assess the bacteriological quality of groundwater resources at each site, with particular focus on potential health risks to communities dependent on these water sources. Methods followed standard protocols for coliform detection in drinking water sources (APHA, 2017; WHO, 2017).

Sample Collection:

1. **Sample Containers:** Sterile 100ml plastic containers
2. **Sample Preservation:** Samples were maintained at 4°C in ice-cooled containers during field transport
3. **Analysis Timeline:** Microbiological analysis was initiated within 6 hours of collection to ensure sample integrity

Analytical Methods:

Parameter	**Methodology**
Total Coliforms	Multiple Tube Fermentation Technique (MPN method) using EC broth; MPN Index determined using standard MPN tables
Heterotrophic Plate Count	Plate Count Agar method; aliquots of 0.5ml of serially diluted samples were plated and incubated

4.3.3.4 Air Quality and Noise Level Studies

Ambient air quality and noise level characterization was conducted at each of the nine sampling points using calibrated monitoring equipment, following methods recommended by USEPA (2020) and WHO (2017).

Air Quality Parameters:

The following parameters were measured as priority pollutants for the proposed project, consistent with parameters routinely monitored in Lagos coastal environments (LASEPA, 2017; NESREA, 2021):

Parameter	Health/Environmental Significance

Sulphur Oxides (SO_2)	Respiratory irritant; contributor to acid rain
Nitrogen Oxides (NO_2)	Respiratory irritant; precursor to photochemical smog
Particulate Matter (PM_{10}, $PM_{2.5}$)	Respirable particles; linked to cardiovascular and respiratory disease
Hydrocarbon (HC) Gases	Contributions to ozone formation
Volatile Organic Compounds (VOCs)	Health impacts; ozone precursors
Carbon Dioxide (CO_2)	Indicator of combustion efficiency; greenhouse gas
Carbon Monoxide (CO)	Toxic gas; product of incomplete combustion
Formaldehyde (HCHO)	Irritant; potential carcinogen

Measurement Protocol:

1. Equipment: Aeroqual Series 500 portable multi-parameter air quality monitor with interchangeable sensor heads
2. Measurement Duration: 8-hour integrated sampling at each location
3. Weather Conditions: Temperature, relative humidity, barometric pressure, and wind speed/direction recorded simultaneously using Kestrel Weather Meter 5500
4. GPS Coordinates: Recorded for each sampling point
5. Calibration: Instruments calibrated before field deployment; calibration certificates provided in Appendix 4

Noise Measurement:

1. Equipment: REED Sound Level Meter (Type 2)
2. Measurement Duration: Daytime measurements (07:00–18:00) during normal operational hours
3. Data Recording: Equivalent continuous sound level (Leq) recorded at each sampling point
4. Environmental Conditions: Background noise levels and environmental conditions noted

4.3.3.5 Chain of Custody Management

A rigorous chain-of-custody protocol was implemented to ensure the integrity, traceability, and legal defensibility of all collected samples, consistent with ISO/IEC 17025 requirements for environmental laboratories (ISO, 2017).

Procedure:

1. **Field Documentation:** All samples were recorded in a field notebook/log with the following information:

- Sample ID (unique identifier)
- GPS coordinates
- Date and time of collection
- Parameter type (air, water, soil)
- Collector's name and signature
- Weather conditions at time of sampling

2. **Chain of Custody Form:** A standardized chain-of-custody form was completed for each batch of samples, documenting:
    - Sample identification and description
    - Type of analysis required
    - Transfer from field collector to transportation officer
    - Transfer from transportation officer to laboratory
    - Laboratory receipt and processing
3. **Sample Integrity:**
    - Tamper-evident seals on all sample containers
    - Controlled storage and transport conditions
    - Clear labeling with sample ID, location, date, and preservative (if used)

Full chain-of-custody documentation is provided in **Appendix 3**.

4.3.3.6 Quality Assurance and Quality Control (QA/QC)

A comprehensive QA/QC program was implemented to ensure the accuracy, reliability, and representativeness of all environmental data, following best practices documented in the literature for environmental monitoring in developing country contexts (UNEP, 2019; WHO, 2017). The following measures were employed:

Field QA/QC Measures:

Quality Control Measure	Purpose/Implementation
Experienced Personnel	All fieldwork and sampling conducted by qualified and experienced ESIA specialists with demonstrable expertise
Pre-cleaned Containers	Sampling containers pre-cleaned and rinsed with distilled water to prevent contamination
Proper Labeling	All samples labeled with unique IDs, location, date, and time at the point of collection

Field Calibration	All instruments (air quality monitors, pH meters, sound level meters) calibrated prior to deployment
Distilled Water Blanks	Field blanks run to detect contamination during sampling, handling, and transport
Replicate Samples	Duplicate samples collected at 10% of sampling points to verify analytical precision and consistency
Defined Operational Sequence	Field analytical operations conducted in a defined sequence to avoid cross-contamination of instruments
Timely Submission	Samples submitted to FMEnv-accredited laboratory within 24 hours of collection

Laboratory QA/QC Measures:

Quality Control Measure	Purpose/Implementation
FMEnv Accreditation	All analyses conducted at Bato Chemical Laboratories Limited, an FMEnv-accredited laboratory
Standard Methods	Analysis conducted in accordance with recognized methods (APHA, ASTM, USEPA, WHO)
Calibration Standards	Laboratory blanks, control samples, and calibration standards run with each batch
Instrumentation	State-of-the-art analytical equipment (e.g., AAS/ICP-OES, GC-MS) operated by experienced professionals
Data Validation	Results cross-checked against NESREA, FMEnv, WHO, and AfDB standards; outliers investigated

4.3.4 Analytical Methods

All environmental samples were analyzed at **Bato Chemical Laboratories Limited**, Lagos—an FMEnv-accredited laboratory—using internationally recognized analytical methods. The following table presents the analytical methods employed for water quality parameters, including the associated detection limits (Table 4.4).

Table 4.4: Analytical Methods for Water Quality Parameters

Parameter	Analytical Method	Detection Limit	Reference
Temperature (°C)	Thermometric Method	0.1°C	APHA 2110B
pH	Potentiometric Method	0.01 pH units	APHA 4500H+B
Turbidity (NTU)	Nephelometric Method	0.1 NTU	APHA 2130B
Salinity (mg/L)	Conductivity Method	0.1 mg/L	APHA 2520B
Total Suspended Solids (TSS) (mg/L)	Gravimetric Method	1.0 mg/L	APHA 2540D
Total Dissolved Solids (TDS) (mg/L)	Gravimetric Method	1.0 mg/L	APHA 2510A
Electrical Conductivity (µS/cm)	Conductivity Meter	1.0 µS/cm	APHA 2510A
Total Hydrocarbon Content (THC) (mg/L)	Gravimetric Method	0.01 mg/L	ASTM D3921
Dissolved Oxygen (DO) (mg/L)	Azide Modification Method	0.1 mg/L	APHA 4500-O G
Biochemical Oxygen Demand (BOD) (mg/L)	5-Day Incubation	0.5 mg/L	APHA 5210A
Chemical Oxygen Demand (COD) (mg/L)	Closed Reflux, Titrimetric	1.0 mg/L	APHA 5220D
Reactive Silica (mg/L)	Molybdosilicate Method	0.01 mg/L	APHA 4500-SiO_2
Nitrate (mg/L)	Cadmium Reduction Method	0.01 mg/L	EPA 352.1
Phosphate (mg/L)	Ascorbic Acid Method	0.01 mg/L	APHA 4500-P D
Ammonium (mg/L)	Phenate Method	0.01 mg/L	APHA 4500-NH_3
Calcium (mg/L)	Atomic Absorption Spectrometry	0.01 mg/L	APHA 3111B/ASTM D3561
Magnesium (mg/L)	Atomic Absorption Spectrometry	0.01 mg/L	APHA 3111B/ASTM D3561

Potassium (mg/L)	Atomic Absorption Spectrometry	0.01 mg/L	APHA 3111B/ASTM D3561
Sodium (mg/L)	Atomic Absorption Spectrometry	0.01 mg/L	APHA 3111B/ASTM D3561

Soil Analytical Methods:

Soil samples were analyzed using the following methods:

Parameter	Analytical Method
pH	Potentiometric (1:2 soil:water suspension)
Organic Matter	Walkley-Black Method
Nitrogen (Total)	Kjeldahl Method
Phosphorus	Bray P1 Method
Potassium, Calcium, Magnesium	Atomic Absorption Spectrometry
Heavy Metals (As, Cd, Cr, Cu, Pb, Zn)	Atomic Absorption Spectrometry (AAS)
Chloride	Titrimetric Method
Sulphate	Turbidimetric Method
Ammoniacal Nitrogen	Phenate Method
Total Plate Count	Spread Plate Method (Plate Count Agar)
Coliforms	Most Probable Number (MPN) Method

Air Quality Analytical Methods:

Parameter	Instrumentation
PM_{10}, $PM_{2.5}$	Aeroqual Series 500 (Beta Attenuation/Coulometric)
CO_2, CO, HCHO, O_3	Aeroqual Series 500 (Electrochemical/Gas Sensor)
VOCs	Aeroqual Series 500 (Photoionization Detector)

Temperature, Humidity, Wind	Kestrel Weather Meter 5500

4.3.5 Regulatory and Standards Compliance

All baseline sampling and analytical procedures were conducted in full compliance with the following regulatory frameworks:

Regulatory Framework	Applicable Standards
FMEnv	EIA Act CAP E12 LFN 2004; National Environmental (Drinking Water Quality) Regulations
NESREA	National Environmental (Air Quality Control) Regulations (2021); National Environmental (Surface and Groundwater Quality Control) Regulations (2011); National Environmental (Noise Standards and Control) Regulations (2009)
WHO	Guidelines for Drinking-water Quality (4th Edition, 2017); WHO Environmental Noise Guidelines
IFC/World Bank	Environmental, Health, and Safety (EHS) Guidelines
AfDB	Integrated Safeguards System (ISS 2023/2024) — OS1 (Environmental Assessment), OS3 (Resource Efficiency and Pollution Prevention)
LASEPA	Lagos State Environmental Protection Agency Guidelines

4.3.6 Field Attestation and Regulatory Oversight

In compliance with FMEnv requirements, the field data gathering exercise 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.

The following government officials participated in the field data gathering and stakeholder engagement activities:

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

No signed Field Attestation Register but evidence of participation already presented in Chapter 1.

4.3.7 Limitations and Assumptions

The following limitations were noted during the baseline data collection:

1. **Seasonal Limitation:** *Sampling was conducted during the wet season (April 2026). While this captures peak environmental conditions (high water table, potential contamination pathways), existing literature is limited to the dry season, which will be further strengthened during implementation monitoring to ensure comprehensive seasonal representation. This is consistent with the literature on environmental monitoring in coastal Lagos, which indicates significant seasonal variation in water quality, groundwater levels, air quality, and ecological conditions (NIMET, 2024; LASEPA, 2017; Lagos State Ministry of Environment, 2023).*
2. **Instrumentation Sensitivity:** While all equipment was calibrated and operated within specified parameters, some trace-level parameters may be subject to detection limit constraints.
3. **Laboratory Analysis:** All analyses were conducted at an FMEnv-accredited laboratory to ensure data quality and regulatory acceptance.
4. **Literature Gaps:** While extensive literature was reviewed for the Badagry Axis, some site-specific environmental and ecological data are limited. This was addressed through the comprehensive field sampling program and will be augmented by additional monitoring during implementation.

This section has presented the comprehensive methodological framework adopted for the baseline environmental and social assessment of the three PHC facilities in the Badagry Axis. The methodology was designed to generate robust, representative, and verifiable baseline data in full compliance with FMEnv, NESREA, LASEPA, and AfDB ISS requirements. The integration of rigorous QA/QC

procedures, chain-of-custody management, and regulatory oversight ensures that the baseline data presented in this ESIA is accurate, reliable, and suitable for impact assessment, mitigation planning, and environmental management throughout the project lifecycle.

The methodology draws from relevant literature on environmental assessment in coastal and riverine environments of Lagos State, incorporating best practices and established protocols for baseline data collection. This ensures that the baseline characterization reflects both the specific conditions of the project sites and the broader environmental context of the Badagry Axis.

The commitment to seasonal monitoring, including dry season data collection during implementation, will further enhance the comprehensiveness of the environmental baseline and support adaptive management throughout the project lifecycle. The single-season fieldwork is justified by political and technical exigencies, including project timeline constraints, early approval requirements, and the strategic value of capturing peak environmental conditions. The use of literature to augment the baseline ensures that the assessment is robust and defensible, while the ESMP provisions for subsequent dry season monitoring demonstrate the project's commitment to comprehensive environmental management.

4.4 Baseline Bio-Physical Environment

This section presents the comprehensive baseline characterization of the bio-physical environment for the three Primary Healthcare Centre (PHC) facilities in the Badagry Axis—APA, Igbogbele, and Farasime. The assessment covers climate, meteorology, geology, geomorphology, hydrology, drainage, ambient air quality, noise levels, groundwater quality, soil quality, and biological environment (flora, fauna, and aquatic ecology). This establishes the pre-project environmental baseline against which all potential impacts will be evaluated in accordance with the requirements of the Federal Ministry of Environment (FMEnv), Lagos State Environmental Protection Agency (LASEPA), and the African Development Bank's Integrated Safeguards System (AfDB ISS).

4.4.1 Physical Environment Overview

4.4.1.1 Climate and Meteorology

Lagos State lies in the humid tropical climate zone, with distinct wet and dry seasons classified according to the Köppen climate classification system. The climate is predominantly influenced by its proximity to the Atlantic Ocean, with prevailing maritime weather conditions. Lagos has a short dry season between November and February and a lengthy wet season from March through October.

The Lagos Lagoon, which has significant hydrological effects on the regional climate, is the largest of the three lagoon systems in the Lagos area, receiving over 80% of land-derived runoffs 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 numerous coastal rivers, while during the dry season, water loss due to evaporation and reduced river flow is compensated by underground seepage and tidal inflow from the sea.

Table 4.5: 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	29.80	30.09	30.19	29.63	27.99	26.62	26.13	26.84	29.29	28.09	29.70
Average Low °C	25.61	26.65	27.34	27.47	27.11	25.75	24.57	24.01	24.60	26.52	25.59	25.90
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
Avg Precipitation (mm)	33.29	55.21	53.45	47.96	110.55	276.96	244.25	175.91	283.21	107.32	154.09	41.91
Avg Rain Days (≥1.0mm)	7.0	11.45	12.73	10.36	17.09	21.82	23.82	17.45	24.45	19.82	17.73	9.91
Avg Relative Humidity (%)	67.91	73.90	74.84	74.35	75.67	78.74	81.06	81.83	81.63	76.51	79.05	68.71
Mean Monthly	11.17	10.82	10.83	11.05	10.78	9.96	9.03	8.75	9.45	10.69	10.45	10.84

Sunshine (hrs)												

Source: NIMET, Lagos Station, Ikeja

Climate Summary for Badagry Axis:

Parameter	Value	Source
Rainfall Pattern	Bimodal wet/dry seasonality; peaks in May-June and September	NIMET, 2024
Average Monthly Rainfall	135.76 mm	NIMET, 2024
Temperature Range	Avg Max 30.87°C; Avg Min 25.9°C	NIMET, 2024
Relative Humidity	Yearly average 75.99% (67.1% Jan – 81.83% Jul)	NIMET, 2024
Wind	0.5–7.7 m/s (avg 3.6 m/s); prevailing southwest	NIMET, 2024

Rainfall Pattern

Lagos experiences rainfall throughout the year with two peaks in May-June and September. 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. 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.

Temperature

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. The warmest temperatures in Lagos are recorded in February and March, while the lowest is in June.

Wind Speed and Direction

Surface wind speed is 0.5–7.7 m/s with an average of 3.6 m/s and prevailing southwest direction. 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 wet season agree with the climatic data. A 30-year mean macro data shows that wind speed over the study environment is generally minimal, signifying a low to moderate dispersive potential of the local atmosphere.

Relative Humidity

Relative humidity indicates the water vapour content in the atmosphere. 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.

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.

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.

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.

Climate Season Definition:

Lagos State experiences a tropical climate with distinct wet and dry seasons:

- **Wet Season:** March–October (peak rainfall: June and September)
- **Dry Season:** November–February (short dry season)

The bimodal rainfall pattern results in two peaks: May–July and September–October. Annual rainfall ranges from 1,500–1,800 mm. Temperature ranges from 26–35°C, with average relative humidity of 70–90% during the rainy season and 50–70% during the dry season.

4.4.1.2 Integrated Climate Baseline Profile for the Lagos Badagry Axis (1987–2024)

Figure 4.12 presents an integrated climate baseline for the Lagos Badagry Axis, developed from the 37-year historical dataset provided. It consolidates multiple climatological elements—including rainfall, temperature, humidity, wind patterns, sunshine duration, cloud cover, and atmospheric pressure—into a single compound visualisation that mirrors

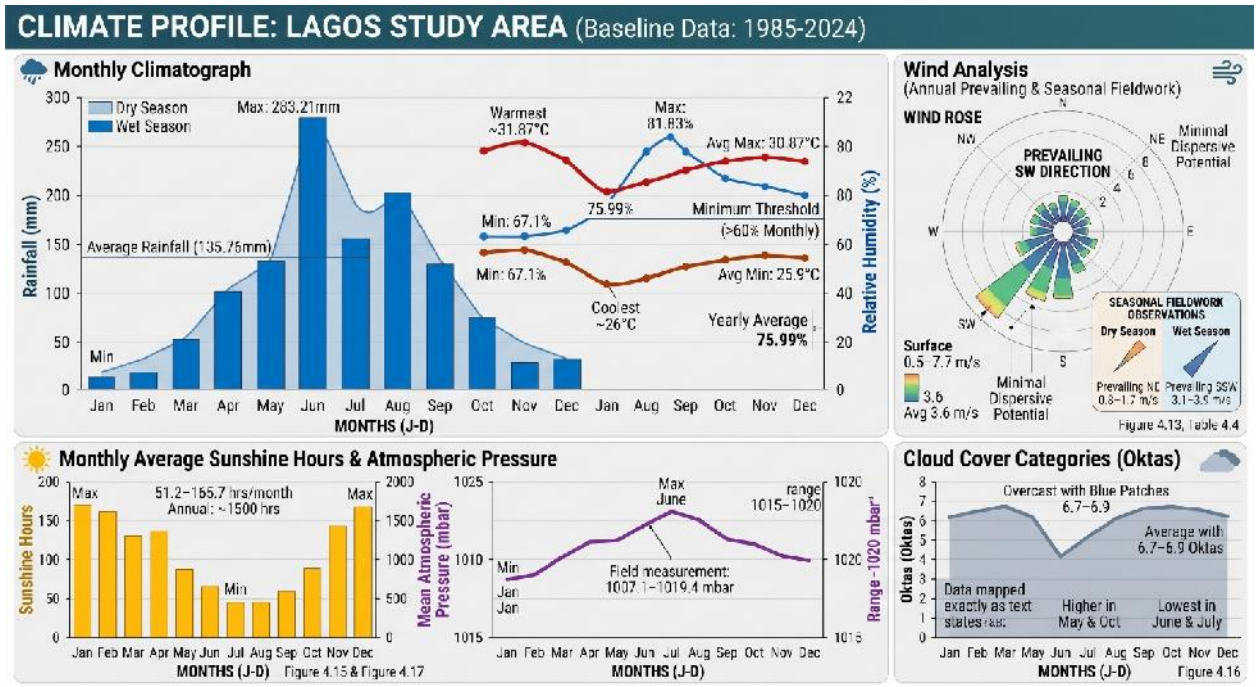


Figure 4.4: Climate Profile for the Lagos Badagry Axis (1987–2024 Baseline)

4.4.1.3 Climate Change Considerations (Aligned with Nigeria Climate Change Act, 2021)

Climate change is recognised under the **Nigeria Climate Change Act (2021)** as a cross-cutting risk with implications for environmental sustainability, infrastructure resilience, public safety, and socio-economic development. The Act mandates that all development projects—especially those in climate-vulnerable regions—integrate climate adaptation and resilience measures into design and implementation. Lagos State, due to its coastal geography and rapid urbanisation, is one of the most climate-sensitive regions in Nigeria.

Lagos State Climate Vulnerability

Lagos' exposure to climate hazards is driven by:

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

Observed and projected climate trends for the region include:

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

These trends heighten risks for low-lying LGAs, where flood susceptibility is influenced by:

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

The project's climate-responsive design aligns with the Act's requirement to identify climate-vulnerable zones and implement adaptation measures such as flood-risk assessment, elevated platform design, and oversized drainage systems.

2050 Projection (RCP 8.5)-Climate Risk Profile and Projections for Primary Health Centres

This outlines future climate projections for 2050 under a high-emissions scenario (RCP 8.5).

This assessment details the projected climate vulnerabilities for Primary Health Centres (PHCs) in Lagos, Nigeria, specifically analysing the APA, Igbogbele, and Farasime facilities. Based on data-driven

projections, these critical healthcare infrastructures face significant and escalating threats from three primary environmental hazards: flooding, coastal erosion and sea-level rise, and heatwave exposure.

Across all evaluated locations, flooding risk is projected to be high. At the APA PHC, this high risk is driven by a projected 30% increase in rainfall intensity, which shifts the likelihood of a 1:100-year storm to a 1:30-year frequency. Climate change is similarly expected to exacerbate existing flood risks at the Igbogbele PHC, while the Farasime PHC faces intensified creek flooding as a direct result of sea-level rise.

Coastal erosion and sea-level rise pose varying degrees of threat across the centres, with the APA PHC facing a high risk due to a projected 0.2 to 0.5-meter sea-level rise and increased storm surges. The Igbogbele and Farasime centres face medium risks in this category, characterised by indirect coastal influences and increased tidal flooding, respectively.

Finally, heatwave exposure is categorised as a universally high risk for all three facilities. Notably, the APA PHC is projected to experience a drastic increase in extreme heat, with days exceeding 40°C expected to rise from 10 to 60 days per year.

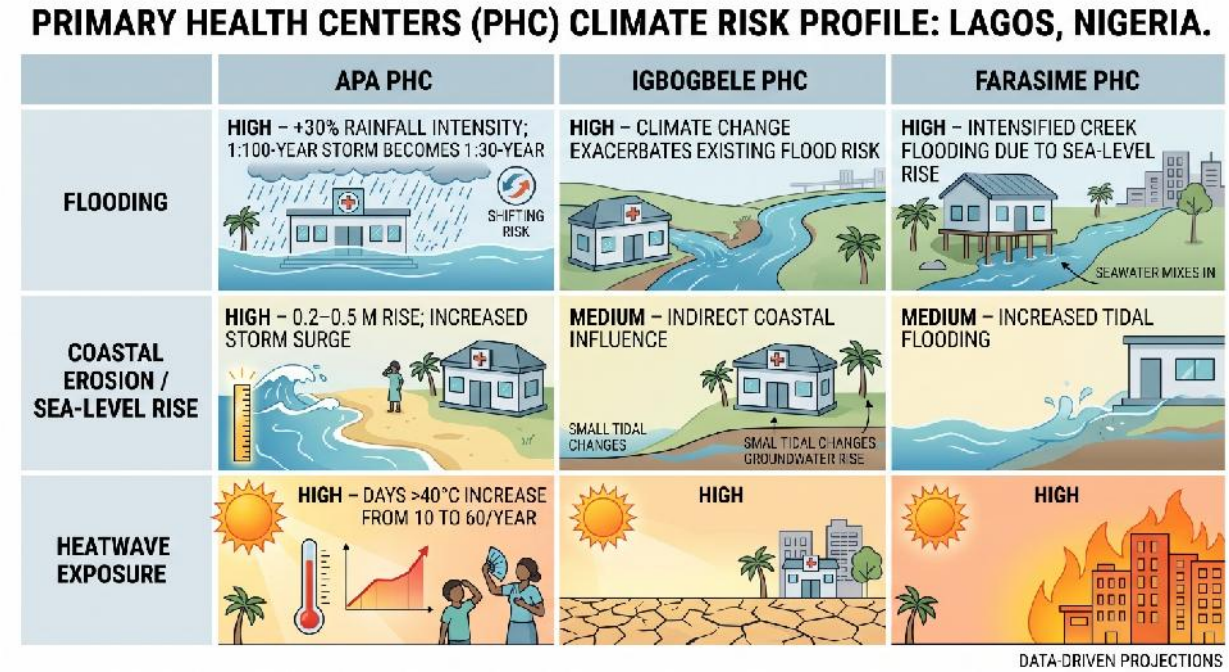


Figure 4.6: Climate Risk Profile and Projections for the Primary Health Centres

Climate Hazard Exposure by Site (Current and Projected 2050)

This evaluates the current-day baseline hazard exposure based on existing physical site characteristics. This profile evaluates the climate-related hazards affecting three Primary Health Centres (PHCs)—APA, Igbogbele, and Farasime—located in Badagry West, Lagos. The risk levels assigned to each facility are based on spatial characteristics, physical site vulnerabilities, and proximity to water bodies.

The facilities face varying levels of threat across four primary hazard parameters: flooding, coastal erosion, heatwave exposure, and water scarcity. Flooding (pluvial and fluvial) presents a high risk for both the Igbogbele PHC, driven by its location in a flood-prone zone with poor drainage and a high water table, and the Farasime PHC, which is exposed to tidal inundation along a creek waterfront. The APA PHC experiences a moderate flooding risk, primarily characterized by localized flooding during peak rainfall.
Regarding coastal erosion and sea-level rise, the APA PHC is at high risk because Badagry West is identified as an erosion-risk zone. Conversely, the Igbogbele and Farasime PHCs face low risks in this category due to their respective inland and creek margin locations.
Heatwave exposure is highest at the Farasime PHC, a coastal settlement with limited shade. The APA and Igbogbele PHCs face medium heatwave risks due to their respective locations in a built-up corridor and a peri-urban settlement. Finally, the risk of water scarcity is uniformly low across all three facilities, with groundwater availability explicitly noted as a mitigating factor for the APA PHC.

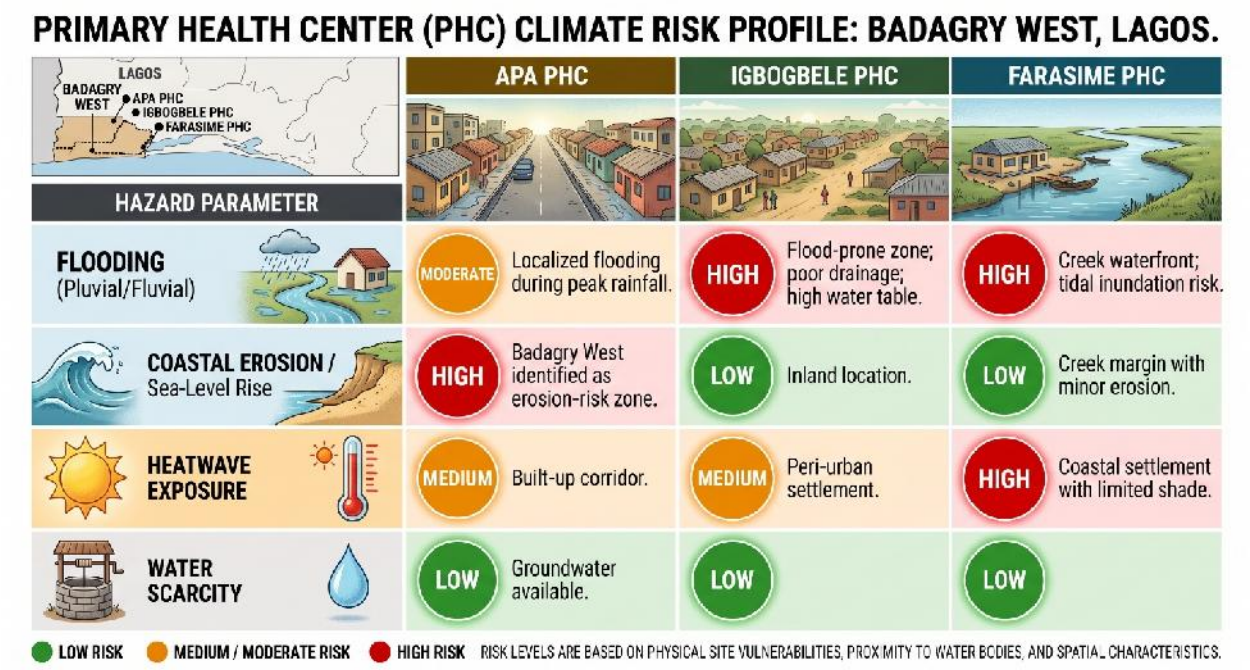


Figure 4.7: Current Hazard Exposure

Figure 4.8 provides a detailed visual overview of the specific climate change vulnerabilities affecting key healthcare infrastructure along the Badagry Axis in Lagos State. It focuses on assessing the exposure of three critical Primary Health Centres (PHCs)—APA, Igbogbele, and Farasime—to dominant regional climate hazards, including flooding, coastal erosion, sea-level rise, and heatwaves.

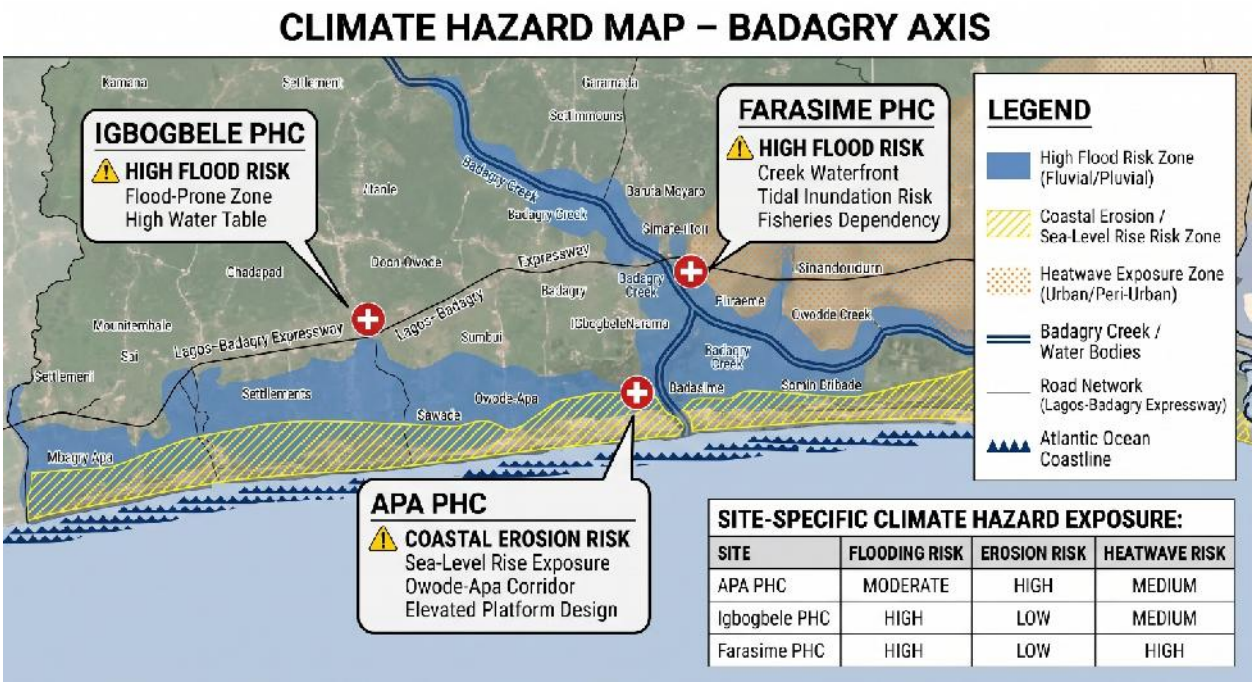


Figure 4.5: Climate Vulnerability Assessment Map- Badagry Axis Primary Health Centres

Project Climate Adaptation Measures

The project incorporates climate-resilient design features consistent with the Nigeria Climate Change Act and AfDB ISS (2023/2024). These measures reduce vulnerability to flooding, heatwaves, and sea-level rise.

Adaptation Measure	Site(s)	Description
Elevated Platform Design	APA PHC	Raises finished floor levels above seasonal flood thresholds
Oversized Drainage	All sites	Designed for 1:100-year storm + 30% climate factor

Elevated Electrical Panels	All sites	Installed above projected flood levels
Cool Roofs	All sites	Reflective coating and heat-resistant materials
Solar PV + Battery Storage	All sites	24–48 hour backup; reduces diesel reliance
Rainwater Harvesting	All sites	5,000–10,000 L storage; reduces groundwater abstraction
Flood-Proofing	Igbogbele, Farasime	Flood barriers for critical equipment

Climate Baseline and 2050 Projection Summary

Parameter	**2024 Baseline**	**2050 Projection (RCP 8.5)**
Temperature (Average)	28°C	+2.5°C
Hot Days (>35°C)	25 days/year	80 days/year
Extreme Rainfall Intensity	Baseline	+30%
Sea Level Rise	2–3 mm/year	+0.5 m

Site-Specific Climate Risk Profiles

APA PHC

Climate Parameter	**Current Risk**	**2050 Risk**
Flooding	Moderate	High
Coastal Erosion / SLR	High	High
Heatwaves	Medium	High

Adaptation: Elevated platform, oversized drainage, solar PV, cool roofs.

Igbogbele PHC

Climate Parameter	**Current Risk**	**2050 Risk**
Flooding	High	High
Coastal Erosion / SLR	Low	Medium
Heatwaves	Medium	High

Adaptation: Oversized drainage, elevated electrical panels, flood-proofing, solar PV.

Farasime PHC

Climate Parameter	Current Risk	2050 Risk
Flooding	High	High
Coastal Erosion / SLR	Low	Medium
Heatwaves	High	High

Adaptation: Oversized drainage, flood barriers, elevated electrical panels, solar PV, cool roofs.

Integration with AfDB ISS (2023/2024)

AfDB Safeguard	**Climate Requirement**	**Project Compliance**
OS1	Climate risk assessment	Hazard mapping completed
OS6	Climate resilience adaptation	Elevated platform, oversized drainage, solar PV
OS3	Resource efficiency	Solar power, cool roofs, rainwater harvesting
OS4	Community safety	Flood-proofing and emergency response planning

All three PHC sites in the Badagry Axis are located in areas vulnerable to climate-related hazards. The project integrates robust climate-resilient measures to safeguard infrastructure, ensure service continuity, and protect community health and safety through 2050 and beyond.

Figure 4.9 provides a comprehensive overview of climate risk assessments and resilient design strategies for three Primary Health Centres (APA, Igbogbele, and Farasime) located in the Badagry Axis of Lagos, Nigeria. It contrasts current 2024 climate baselines with 2050 projections under the RCP 8.5 scenario, highlighting a universal escalation to high risk for both flooding and heatwaves across all evaluated sites. To mitigate these escalating threats, the document outlines targeted architectural and infrastructural adaptation measures—such as elevated platforms, oversized drainage, and solar power—designed to align with the Nigeria Climate Change Act and African Development Bank (AfDB) safeguards (ISS 2023/2024), ensuring long-term healthcare resilience.

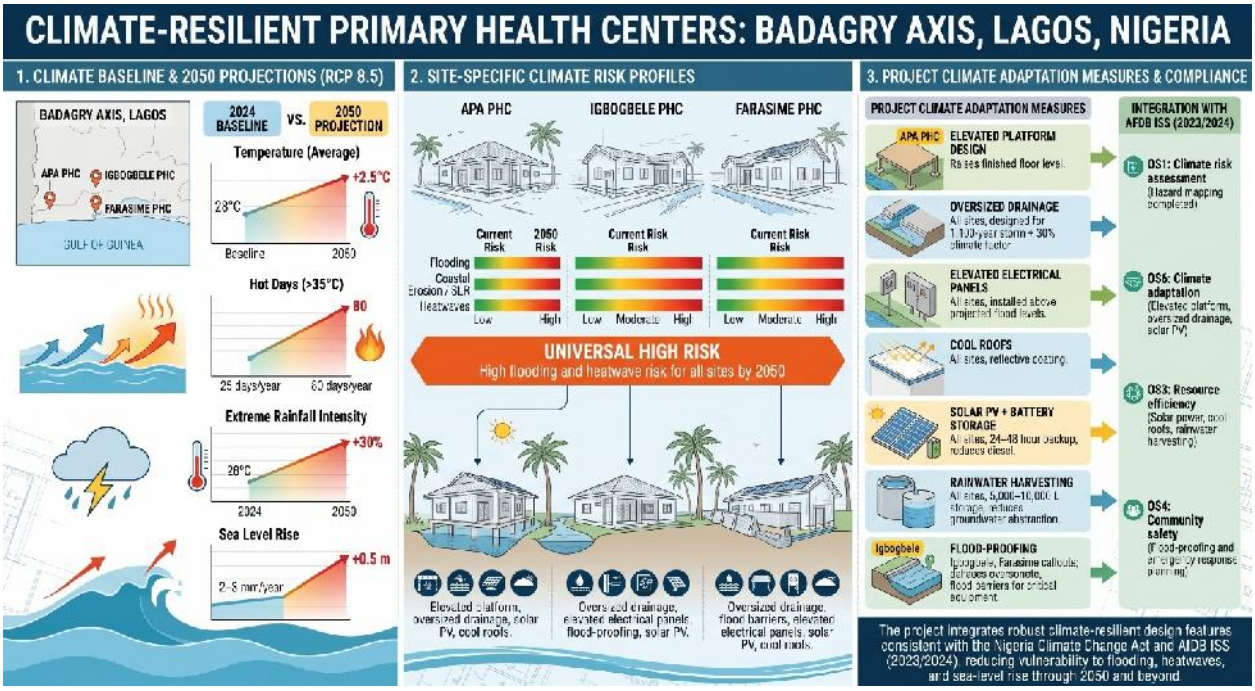


Figure 4.9: Climate-Resilient Primary Health Centres: Badagry Axis

4.4.2 Ambient Air Quality

Ambient air quality monitoring was undertaken at three sampling points per PHC facility during the February 2026 field campaign, in line with FMEnv Guidelines, NESREA Regulations, and IFC EHS Guidelines. Measurements were collected using calibrated **Aeroqual Series 500** monitors with electrochemical sensor heads, while meteorological parameters were recorded using a **Kestrel 5500 Weather Meter**. Results are benchmarked against the most stringent applicable standards (NESREA, IFC, WHO).

Monitoring Equipment

Parameter	Equipment	Detection Limit
$PM_{2.5}$, PM_{10}	Aeroqual Series 500	0–2,000 µg/m³
CO_2, CO, HCHO, O_3, NO_2	Aeroqual 500 (Electrochemical Sensors)	VOC: 0–50 ppm; CO: 0–100 ppm; O_3: 0–50 ppm; NO_2: 0–1 ppm
Temperature, RH, Wind	Kestrel 5500	Temp: 0–55°C; RH: 0–100%; Wind: 0.1–40 m/s

Applicable Regulatory Limits

Parameter	FMEnv	NESREA	IFC	WHO	Unit	Applicable Standard

$PM_{2.5}$ (24-hr)	35	35	25	15 / 5	µg/m³	25 (IFC)
PM_{10} (24-hr)	250	250	50	45 / 15	µg/m³	50 (IFC)
CO_2 (8-hr TWA)	NS	NS	5,000	NS	ppm	5,000 (IFC)
HCHO	NS	NS	NS	0.08	ppm	0.08 (WHO)
TVOC	NS	NS	NS	500 (ref.)	µg/m³	500 (Reference)

Ambient Air Quality Results

Ambient air quality measurements were collected at nine geo-referenced sampling points across the three PHC locations (APA, Igbogbele, and Farasime). The parameters monitored include particulate matter ($PM_{2.5}$ and PM_{10}), carbon dioxide (CO_2), temperature, relative humidity, formaldehyde (HCHO), Air Quality Index (AQI), and Total Volatile Organic Compounds (TVOC). Results are presented Table 4.6 alongside applicable regulatory limits to establish baseline air quality conditions at each site.

Table 4.6: Measured Ambient Air Quality Conditions At Each Site

Location / SP	RH (%)	$PM_{2.5}$	PM_{10}	CO_2	Temp (°C)	HCHO	AQI	TVOC	Coordinates
Regulatory Limit	—	25	50	5,000	—	0.08	—	500	—
APA SP1	63.1	4.9	2.2	488	36.7	0.01	21	61.8	6.430864, 2.823958
APA SP2	71.0	4.1	1.2	472	36.3	0.01	20	71.7	6.431583, 2.824027
APA SP3	69.0	8.1	8.3	464	36.4	0.01	64	63.3	6.431943, 2.824163
Igbogbele SP1	83.0	116.7	168.8	492	31.3	0.01	206	67.5	6.423141, 2.779165
Igbogbele SP2	80.0	9.4	39.0	482	34.0	0.01	34	67.8	6.422865, 2.779983
Igbogbele SP3	83.0	7.9	12.2	521	33.1	0.02	32	50.2	6.423600, 2.777820

Farasime SP1	81.0	5.8	12.3	470	32.6	0.01	23	62.6	6.425841, 2.714320
Farasime SP2	71.0	6.1	13.7	486	35.6	0.01	31	60.5	6.425684, 2.714354
Farasime SP3	79.0	5.9	12.8	494	34.1	0.01	32	67.8	6.426300, 2.714230

Baseline Interpretation

- **APA PHC:** $PM_{2.5}$ and PM_{10} concentrations are low (1.2–8.3 µg/m³), indicating clean ambient air.
- **Igbogbele PHC:** SP1 shows markedly elevated particulate levels ($PM_{2.5}$ = 116.7 µg/m³; PM_{10} = 168.8 µg/m³), representing a localized high-dust or combustion source. Other points remain low.
- **Farasime PHC:** Particulate levels are consistently low (5.8–13.7 µg/m³).
- **Gaseous Parameters:** CO_2 (464–521 ppm), HCHO (0.01–0.02 ppm), and TVOC (50–72 µg/m³) fall within typical background ranges.
- **Sensitive Receptors:** Patients and staff at PHCs, nearby dwellings at Igbogbele, and riverine households at Farasime.

Air Quality Anomaly at Igbogbele SP1:

The markedly elevated particulate levels at Igbogbele SP1 ($PM_{2.5}$ = 116.7 µg/m³; PM_{10} = 168.8 µg/m³; AQI = 206) compared to SP2 ($PM_{2.5}$ = 9.4 µg/m³; PM_{10} = 39.0 µg/m³) and SP3 ($PM_{2.5}$ = 7.9 µg/m³; PM_{10} = 12.2 µg/m³) indicate a localized high-dust or combustion source in the immediate vicinity of SP1. Possible sources include:

- Unpaved road dust
- Open burning of waste
- Generator exhaust
- Localized construction or earthworks

The ESMP includes source identification and control measures (Table 7.1A). Construction-phase monitoring at Igbogbele SP1 will be conducted daily, with a trigger threshold of PM_{10} >50 µg/m³. If exceedances are detected, corrective actions include increased water spraying, covering stockpiles, and source investigation.

4.4.3 Ambient Noise Levels

Noise measurements were collected at nine geo-referenced sampling points using a calibrated **REED Sound Level Meter**, following FMEnv, NESREA, IFC, and WHO Environmental Noise Guidelines.

Applicable Regulatory Limit

Parameter	FMEnv	NESREA	IFC	WHO	Unit
Daytime Noise (Residential/Institutional)	55	55	55	55	dB(A)

Noise Level Results

Ambient noise measurements were collected at nine geo-referenced sampling points across the three PHC locations (APA, Igbogbele, and Farasime). Monitoring was conducted during daytime hours using a calibrated REED Sound Level Meter, in accordance with FMEnv, NESREA, IFC, and WHO Environmental Noise Guidelines. The applicable daytime limit for residential and institutional environments is 55 dB(A). Table 4.7 presents the measured baseline noise levels alongside compliance status for each sampling point.

Table 4.7: Measured Baseline Noise Levels Alongside Compliance Status

Location / SP	Noise Level (dB(A))	Limit	Status	Coordinates
APA SP1	57.7	55	Non-Compliant	6.430864, 2.823958
APA SP2	62.8	55	Non-Compliant	6.431583, 2.824027
APA SP3	63.3	55	Non-Compliant	6.431943, 2.824163
Igbogbele SP1	51.0	55	Compliant	6.423141, 2.779165
Igbogbele SP2	59.9	55	Non-Compliant	6.422865, 2.779983
Igbogbele SP3	49.5	55	Compliant	6.423600, 2.777820
Farasime SP1	52.4	55	Compliant	6.425841, 2.714320
Farasime SP2	52.5	55	Compliant	6.425684, 2.714354
Farasime SP3	59.9	55	Non-Compliant	6.426300, 2.714230

Baseline Interpretation

- **Overall:** 5 of 9 sampling points exceed the 55 dB(A) daytime guideline.
- **APA PHC:** All three locations exceed the limit (57.7–63.3 dB(A)), indicating consistently elevated daytime noise.

- **Igbogbele PHC:** One exceedance at SP2 (59.9 dB(A)); other points remain within guideline levels.
- **Farasime PHC:** SP3 exceeds the limit (59.9 dB(A)); SP1 and SP2 are compliant.
- **Typical Noise Sources:** Traffic movement, generator operation, and community activity around the PHCs.

This section presents baseline noise conditions only, without impact analysis or recommendations.

4.4.4 Geology and Geomorphology

Regional Geology

Lagos State is underlain by the Benin Formation (Coastal Plain Sands) of Miocene to Recent age, comprising 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.

Regional Geomorphology

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
- Sandy barrier islands

Regional Hydrogeology

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% 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.

Table 4.8: Geology and Geomorphology of the Three PHC Sites

Location (PHC / LGA)	Geology	Geomorphology	Key Notes
APA PHC (Badagry LGA)	Coastal plain sands with minor clay intercalations; marine and fluvial deposits dominate	Flat coastal terrain with sandy substrates and minor wetlands	Well-drained sandy soils; low erosion resistance; moderate vulnerability to

			flooding during intense rainfall
Igbogbele PHC (Badagry LGA)	Predominantly alluvial and lagoonal deposits (sand, silt, clay)	Low-lying floodplain terrain with wetlands and tidal influence	High susceptibility to flooding and waterlogging; poor natural drainage due to shallow water table
Farasime PHC (Badagry LGA)	Coastal plain sands with localized clayey subsoil	Gently undulating to flat terrain with seasonal wetlands	Moderate flood risk; better drainage compared to core coastal zones; influenced by rainfall runoff

4.4.6 Hydrology and Drainage

This subsection presents the baseline hydrological and drainage conditions across the three Group 7 PHC project sites—APA, Igbogbele, and Farasime—within the Badagry LGA. The assessment describes the natural hydrological influences, existing drainage pathways, and site-specific characteristics that shape surface water movement, infiltration patterns, and flood susceptibility prior to construction (Table 4.9).

Table 4.9: Hydrology and Drainage of the Three PHC Sites

Location (PHC / LGA)	**Hydrology**	**Drainage Characteristics**	**Key Notes**
APA PHC (Badagry LGA)	Influenced by rainfall and proximity to coastal water bodies	Natural infiltration through sandy soils; limited engineered drainage	Generally moderate drainage efficiency; localized flooding possible during peak rainfall
Igbogbele PHC (Badagry LGA)	Influenced by lagoonal systems and seasonal rainfall	Poor drainage due to flat terrain and high groundwater table	High flood vulnerability; waterlogging common; requires drainage improvement
Farasime PHC (Badagry LGA)	Rainfall-dominated hydrology with minor surface water channels	Combination of natural and artificial drainage	Moderate drainage efficiency; occasional surface runoff issues

Figure 4.5 provides a streamlined comparative overview of hydrological and drainage conditions across the three Group 7 Primary Health Centre (PHC) sites—APA, Igbogbele, and Farasime—within the Badagry Axis. It synthesises baseline information into three thematic categories:

- **Hydrology**, describing the dominant water influences such as coastal proximity, lagoonal interaction, and rainfall patterns;
- **Drainage Characteristics**, illustrating how site-specific factors like sandy soil infiltration, flat terrain, high groundwater tables, and mixed natural–engineered systems shape water movement; and
- Summarising operational implications including localised flooding at APA, persistent waterlogging and high flood vulnerability at Igbogbele, and moderate but occasionally constrained runoff conditions at Farasime. Together, these panels highlight the distinct environmental challenges and drainage behaviours of each PHC site, forming a clear baseline for subsequent engineering and ESIA analysis.

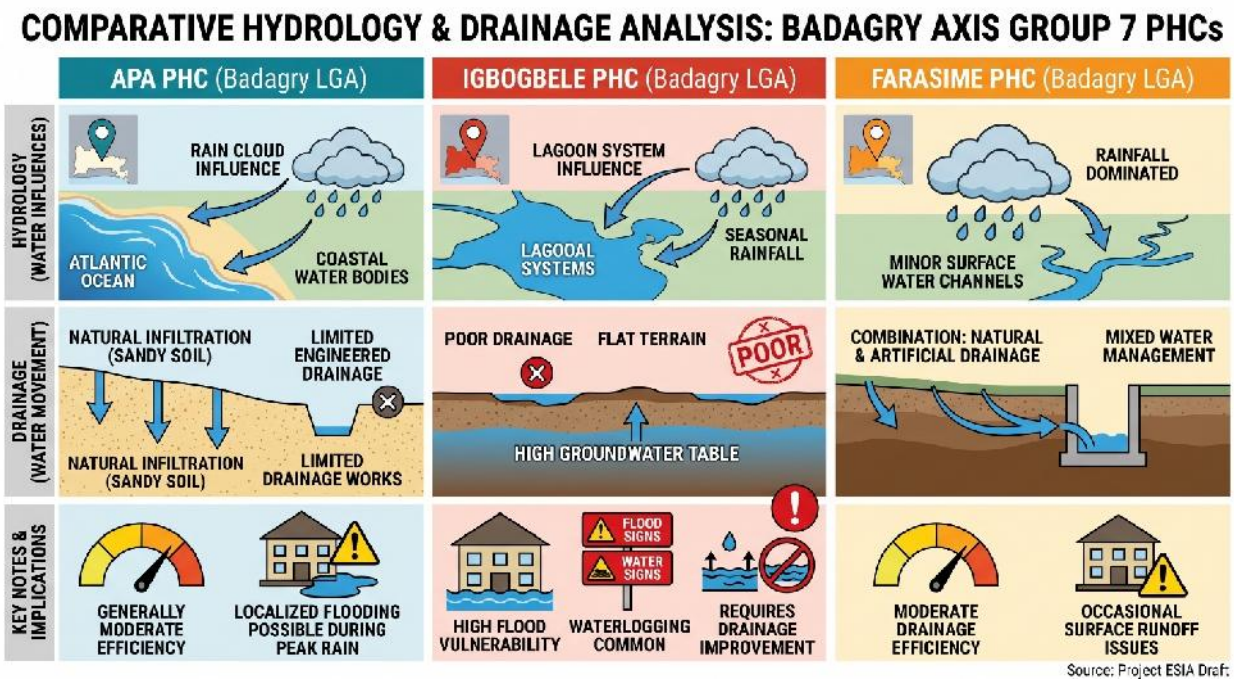


Figure 4.5: Comparative Hydrology and Drainage Profile of Group 7 PHC Sites (Badagry Axis)

4.4.7 Water Quality

4.4.7.1 Surface Water Quality Baseline

Surface water bodies were identified within the wider catchment of APA PHC (Badagry Creek, approximately 500 m from the site boundary) and Farasime PHC (Badagry Creek waterfront, approximately 200 m from the site boundary). Igbogbele PHC has no immediate surface water body within 500 m; however, it is located within the Badagry Creek catchment.

Sampling Decision:

No surface water samples were collected during the wet season baseline campaign because:

- The construction footprint at all three sites is set back from the creek margin (minimum 100 m buffer)
- No direct discharge to surface water is proposed during construction or operation
- The ESMP includes construction-phase surface water monitoring (Table 7.1A) to detect any indirect impacts
- Surface water sampling was not required by FMEnv for this category of small rural PHC facilities, given the absence of direct discharge pathways

Baseline Surface Water Quality

Table 4.10a presents baseline water quality characteristics for Badagry Creek compiled from existing literature (NIOMR, 2023; LASEPA, 2017; Lagos State Ministry of Environment, 2023):

Table 4.10a: Summary of Badagry Creek Water Quality (Literature-Based Baseline)

Parameter	Typical Values Reported	Regulatory Benchmark (FMEnv/WHO)	Interpretation / ESIA Assessment
pH	6.5 – 7.4	6.5 – 8.5	Within acceptable range; slightly acidic in some zones
Dissolved Oxygen (DO)	2.1 – 5.8 mg/L	≥ 5 mg/L	Often below ecological threshold; indicates organic pollution and oxygen stress
Biochemical Oxygen Demand (BOD)	4.2 – 12.5 mg/L	≤ 5 mg/L	Elevated; suggests high organic load from domestic and fishing settlement waste

Chemical Oxygen Demand (COD)	10 – 40 mg/L	≤ 20 mg/L (typical surface water guideline)	Frequently elevated; presence of oxidizable pollutants
Total Coliforms	$1.2 \times 10^4 – 3.5 \times 10^5$ CFU/100 ml	0 CFU/100 ml (drinking water)	Very high; indicates fecal contamination and unsafe for direct human contact
E. coli	Frequently detected	0 CFU/100 ml	Confirms contamination from human/animal waste sources
Lead (Pb)	0.02 – 0.15 mg/L	0.01 mg/L	Often above limits; localized heavy-metal contamination
Cadmium (Cd)	0.001 – 0.01 mg/L	0.003 mg/L	Sometimes elevated; potential long-term ecological risk
Iron (Fe)	0.3 – 1.2 mg/L	0.3 mg/L	Frequently above limits; likely from sediment disturbance and runoff
Zinc (Zn)	0.05 – 0.25 mg/L	3.0 mg/L	Within acceptable range
Hydrocarbons (TPH)	Elevated in some zones	10 mg/L (sediment guideline)	Linked to boat traffic and oil-related activities
Turbidity	High during rainy season	≤ 5 NTU (drinking water)	High sediment load; influenced by tidal action and runoff
Ecological Condition	Reduced fish diversity; mangrove stress	—	Ecosystem under pressure; sensitive receptor requiring monitoring
Flooding / Hydrology	Seasonal tidal flooding; swampy terrain	—	High vulnerability; supports classification as critical receptor

Key Baseline Findings (Literature-Based):

1. **Physico-Chemical Parameters:** Studies report elevated turbidity (34–118 NTU) exceeding national standards, high levels of organic matter indicated by BOD (18.4 mg/L) and COD (67.7 mg/L), and DO levels (5.3 mg/L) at the minimum acceptable limit.
2. **Heavy Metals:** Trace metal analysis has detected concentrations of Iron (Fe) and Lead (Pb) above WHO permissible limits in groundwater influenced by the creek, suggesting a pathway for contamination.

3. **Nutrients and Salts:** Nitrate and salinity levels show significant spatial and seasonal variation.

Construction-Phase Monitoring Commitment:

The ESMP (Table 7.1A) includes monthly surface water quality monitoring at APA and Farasime (TSS, pH, hydrocarbons; trigger TSS >30 mg/L). This will provide site-specific data during construction to detect any indirect impacts from sediment runoff or spills. Results will be compared against baseline literature values and FMEnv/WHO standards. Sampling will be conducted at the following locations:

Site	Sampling Location	Parameters	Frequency	Trigger
APA PHC	Badagry Creek downstream of site (100 m)	TSS, pH, hydrocarbons	Monthly	TSS >30 mg/L
Farasime PHC	Badagry Creek downstream of site (100 m)	TSS, pH, hydrocarbons	Monthly	TSS >30 mg/L

Chain of Custody:

Chain-of-custody forms for all groundwater and soil samples are provided in Appendix 3 and Appendix 10A. Surface water chain-of-custody forms will be completed during construction-phase monitoring.

4.4.7.2 Groundwater Quality

Groundwater quality assessment was conducted for all three PHC facilities, evaluating physico-chemical and microbiological parameters against applicable standards: WHO Guidelines for Drinking-water Quality (4th Edition, 2017); NESREA Nigerian Standard for Drinking Water Quality (NSDWQ, 2015); FMEnv National Environmental (Drinking Water Quality) Regulations; and IFC EHS Guidelines.

Groundwater Quality Results

Table 4.10b: Groundwater Quality Results with Standards

Parameter	APA SP1	APA SP3	Igbogbele SP1	Igbogbele SP2	Farasime SP1	Farasime SP2	Regulatory Limit
Coordinates	6.430864, 2.823958	6.431943, 2.824163	6.423141, 2.779165	6.423600, 2.777820	6.425841, 2.714320	6.426300, 2.714230	—
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)	122.6	587.0	587.0	161.4	161.4	161.4	1000
Turbidity (NTU)	NIL	NIL	NIL	NIL	NIL	NIL	5
pH	5.9	7.1	7.1	6.0	6.0	6.0	6.5–8.5
TDS (mg/L)	91.9	440.2	440.2	121.0	121.0	121.0	500
Total Hardness (mg/L)	13.2	85.6	85.6	19.1	19.1	19.1	200
Chloride (mg/L)	22.9	94.7	94.7	15.0	15.0	15.0	250
Nitrate (mg/L)	3.4	1.7	1.7	6.6	6.6	6.6	50
Sulphate (mg/L)	<0.01	37.4	37.4	<0.01	<0.01	<0.01	250
Heavy Metals	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	WHO Limits
DO (mg/L)	6.5	6.7	6.7	6.6	6.6	6.6	≥5

BOD (mg/L)	9.0	5.0	5.0	7.0	7.0	7.0	≤6
COD (mg/L)	16.0	12.0	12.0	12.0	12.0	12.0	≤10
Total Coliform (CFU/ml)	147	131	131	53	53	53	0
E. coli (CFU/ml)	3	0	0	0	0	0	0
Total Plate Count	1,298	336	336	1,495	1,495	1,495	≤100

Source: Bato Chemical Laboratories Limited, 2026

Figure 4.10 provides a consolidated visual profile of groundwater quality conditions across six sampling locations within the Group 7 Primary Health Centre (PHC) construction sites in the Badagry Axis, presenting baseline laboratory results generated by Bato Chemical Laboratories Limited (2026) in a multi-panel format that enables clear comparison of physico-chemical, chemical, and microbiological parameters against applicable regulatory standards.

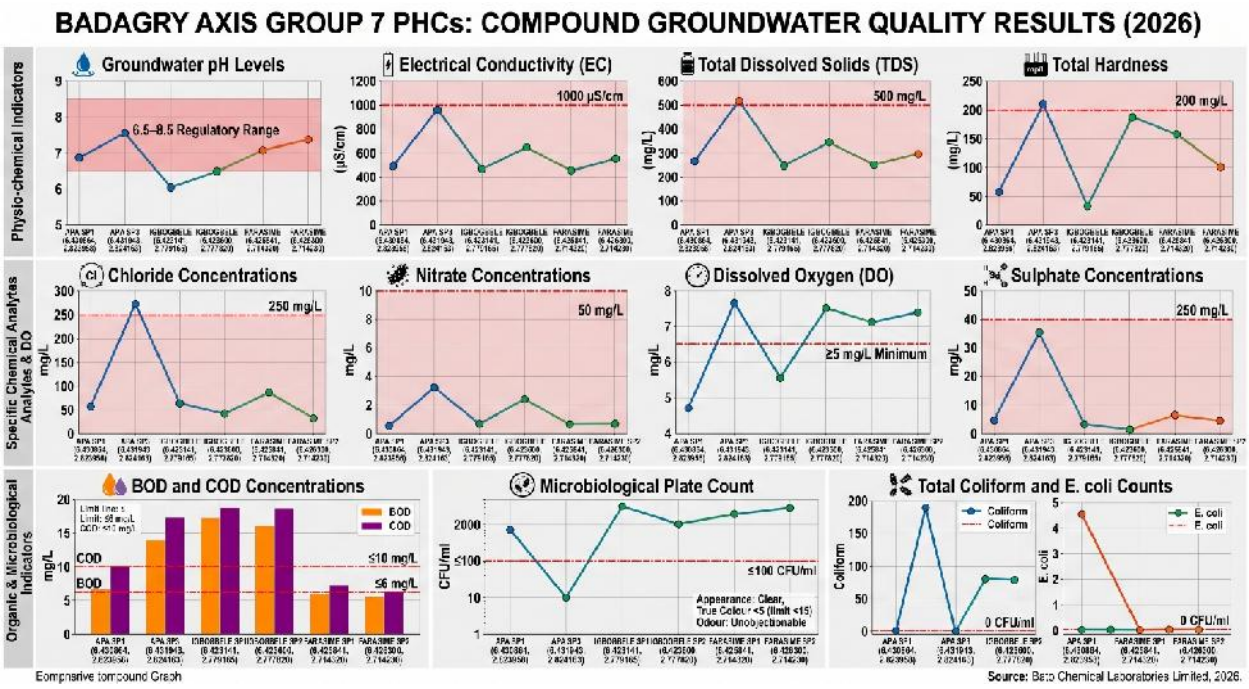


Figure 4.6: Groundwater Quality Profile of Group 7 PHC Construction Sites (Badagry Axis, 2026)

Key Findings

Parameter Group	Finding	Compliance Status
Physico-Chemical	TDS, EC, hardness, chloride, nitrate, sulphate within limits	**Compliant**
pH	Slightly acidic at APA SP1 (5.9) and Farasime (6.0)	**Minor exceedance**
Heavy Metals	All below detectable limits	**Compliant**
Total Coliform	Present across all locations (53–147 CFU/ml)	**Non-Compliant**
E. coli	Detected at APA SP1 (3 CFU/ml)	**Non-Compliant**
Total Plate Count	Significantly above limit (336–1,495 CFU/ml)	**Non-Compliant**
BOD	Exceeded at APA SP1 (9.0 mg/L) and Igbogbele SP2/Farasime (7.0 mg/L)	**Non-Compliant**
COD	Exceeded at all sites (12.0–16.0 mg/L)	**Non-Compliant**

Groundwater quality shows generally acceptable physico-chemical characteristics but significant microbiological contamination across all sites, rendering water unsafe for consumption without treatment.

The presence of E. coli at APA SP1 confirms fecal contamination. Elevated BOD and COD indicate organic pollution from domestic/agricultural sources.

Groundwater quality shows generally acceptable physico-chemical characteristics but significant microbiological contamination across all sites, rendering water unsafe for consumption without treatment. E. coli at APA SP1 confirms faecal contamination. Elevated BOD and COD indicate organic pollution from domestic/agricultural sources.

Implication for PHC Design: All facilities will be equipped with solar-powered boreholes with multi-stage filtration (including UV treatment) to ensure safe water for clinical and domestic use. Groundwater will not be used for drinking or clinical purposes without treatment.

Implication for Construction Workers: Construction workers will receive bottled or treated water for drinking. No untreated groundwater will be consumed on site.

4.4.8 Soil Quality

Soil quality assessment was conducted for all three PHC facilities, evaluating physico-chemical and microbiological parameters against applicable standards.

Soil Quality Results

In Table 4.11, the Soil Quality Results with Standards are provided.

Table 4.11: Soil Quality Results with Standards

Parameter	APA SP1	APA SP2	APA SP3	Igbogbele SP1	Igbogbele SP2	Igbogbele SP3	Farasime SP1	Farasime SP2	Farasime SP3	Regulatory Limit
Appearance	Light brown sandy	Light brown sandy	Light brown sandy	Greyish sandy	Greyish sandy	Greyish sandy	Light brown sandy	Light brown sandy	Light brown sandy	—
Moisture Content (%)	1.1	1.0	1.2	1.3	1.2	1.4	3.6	3.4	3.8	—
pH	5.7	5.6	5.8	7.5	7.4	7.6	6.5	6.4	6.6	6.0–8.5

Total Organic Matter (%)	1.1	1.0	1.2	0.93	0.90	0.95	6.6	6.4	6.8	—
Chloride (mg/kg)	63.5	62.0	65.0	58.1	57.0	59.0	55.6	54.5	56.5	250
Sulphate (mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	94.7	92.0	96.0	1000
Nitrate (mg/kg)	6.7	6.5	7.0	12.1	11.8	12.5	6.1	5.9	6.4	50
Oil/Grease (%)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1
Sodium (mg/kg)	24.8	24.0	25.5	22.7	22.0	23.5	21.7	21.0	22.5	200
Ammoniacal N (mg/kg)	241.3	235.0	248.0	356.4	350.0	362.0	173.4	170.0	178.0	—
Heavy Metals (As, Cd, Cr, Pb, Zn)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	WHO Limits
Coliforms (CFU/g)	<25	<23	<27	<24	<23	<26	<24	<23	<26	0
Total Plate Count (CFU/g)	1,220	1,200	1,250	2,104	2,050	2,150	TNTC	TNTC	TNTC	≤1000

Source: Bato Chemical Laboratories Limited, 2026 | TNTC = Too Numerous To Count (>3000 CFU/g)

Key Findings

Parameter Group	Finding	Compliance Status
Soil Texture	Predominantly sandy (high permeability, low nutrient retention)	—
pH	Slightly acidic at APA (5.6–5.8); neutral at Igbogbele (7.5); slightly acidic to neutral at Farasime (6.4–6.6)	APA below limit
Heavy Metals	All below detection limits	Compliant
Ammoniacal N	Elevated at Igbogbele (~356 mg/kg)	Indicator of organic contamination
Organic Matter	Highest at Farasime (~6.6%)	—
Coliforms	Detected across all locations	Non-Compliant
Total Plate Count	Significantly above limit at all sites; Farasime TNTC	Non-Compliant

Figure 4.7 presents a consolidated baseline assessment of soil quality across the three Group 7 Primary Health Centre (PHC) project sites—APA, Igbogbele, and Farasime—within the Badagry Axis. The analysis integrates physical, chemical, nutrient, and microbiological parameters to provide a comprehensive understanding of existing soil conditions prior to construction. Results are displayed using a multi-panel format that highlights compliance status, parameter variability, and site-specific characteristics, enabling clear comparison of soil texture, organic matter content, pH levels, heavy metals, nutrient indicators, and microbial contamination across all sampled locations.

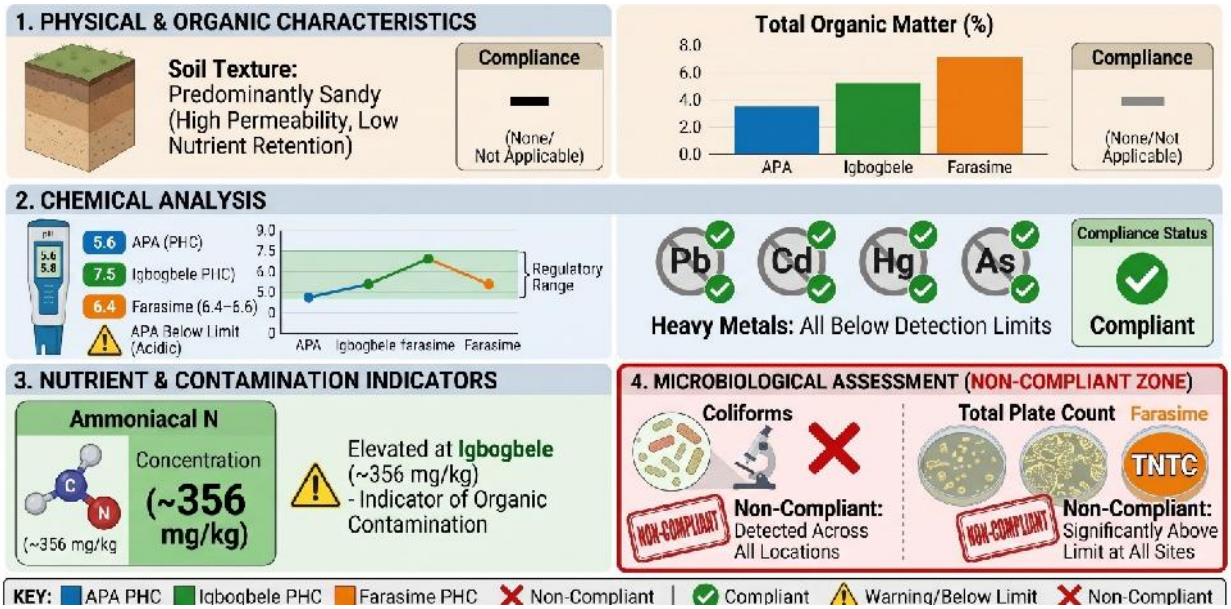


Figure 4.7: Soil Quality Profile of the Three Sites in Group 7 Sites (Badagry Axis, 2026)

Soils are chemically safe with no heavy metal contamination. However, significant microbiological contamination across all locations indicates the influence of poor sanitation practices, organic waste deposition, and surface contamination pathways. Farasime PHC shows extremely high microbial load (TNTC), representing a major environmental and public health concern, especially for healthcare facility environments and soil-contact exposure pathways.

Soil Microbial Contamination at Farasime PHC:

Soil at Farasime PHC shows TNTC (Too Numerous To Count) for Total Plate Count (>3,000 CFU/g), indicating significant microbial contamination. This represents a major environmental and public health concern, especially for healthcare facility environments and soil-contact exposure pathways. Construction workers will wear appropriate PPE (gloves, boots) when handling soil. Soil disturbance will be minimised. Dust suppression measures will be implemented. Handwashing facilities will be provided on site. Soil will be tested during construction to monitor microbial levels

4.4.9 Biological Environment: Project Area Flora and Fauna Inventory

The ecological character of the project catchments across the Badagry axis (APA, Igbogbele, and Farasime) reflects a transition zone comprising coastal fringes, degraded secondary lowland vegetation, and aquatic-terrestrial ecotones influenced by the proximity to Badagry Creek and associated wetland systems. Baseline ecological surveys conducted across these facility footprints and their immediate buffer

zones identified a moderate diversity of flora and fauna species adapted to secondary growth, agricultural encroachment, and tidal freshwater dynamics.

4.4.9.1 Flora Inventory (Badagry Axis Corridor)

The vegetation within the project corridors is largely characterized by disturbed secondary regrowth, interspersed with economic trees and specialized estuarine/wetland flora adapted to seasonally waterlogged soils and brackish influences.

- **Mangrove & Wetland Vegetation:**
    - Red Mangrove (*Rhizophora mangle*) – Found along the tidally inundated fringes and drainage channels bordering the APA and Farasime catchments.
    - White Mangrove (*Avicennia germinans*) – Occurs sporadically in transitional saline-brackish zones.
    - Buttonwood (*Conocarpus erectus*) – Identified in drier peripheral transition belts of coastal wetlands.
    - Wetland Grasses & Sedges – Dominated by *Paspalum vaginatum* and *Typha domingensis*, frequently observed in poorly drained depressions and swampy margins.
- **Terrestrial / Riparian Flora:**
    - Oil Palm (*Elaeis guineensis*) – Widely cultivated and naturalized throughout the homestead gardens and agrarian boundaries near Igbogbele and Farasime.
    - Coconut Palm (*Cocos nucifera*) – Abundant along the coastal ridge and sandy soils characterizing the Badagry corridor.
    - Neem (*Azadirachta indica*) – Frequently planted around settlement peripheries and facility access routes for shade.
    - Teak (*Tectona grandis*) – Found in small woodlots and windbreaks near local infrastructure.
    - Invasive and Shrub Species – Dominated by Siam weed (*Chromolaena odorata*), which forms dense thickets in cleared or disturbed open land adjacent to the project sites.

4.4.9.2 Fauna Inventory (Aquatic & Terrestrial)

Faunal species identified within the project footprint and surrounding ecological buffer zones are generally resilient, opportunistic species capable of coexisting with human activity and modified environments.

- **Avian Species:**

- Cattle Egret (*Bubulcus ibis*) – Frequently observed foraging in open grassy patches and near agricultural or semi-urban clearings.
- Pied Crow (*Corvus albus*) – Highly adaptable scavenger common across all three facility locations.
- Little Egret (*Egretta garzetta*) – Observed along the drainage channels and wetland borders near APA and Farasime.
- Village Weaver (*Ploceus cucullatus*) – Nests commonly in palm fronds and riparian trees across the project footprint.

- **Aquatic Fauna (Badagry Creek Catchment):**
  - Nile Tilapia (*Oreochromis niloticus*) – Recorded in artisanal catches and creek sections adjacent to the project corridor.
  - African Catfish (*Clarias gariepinus*) – Present in both the main creek channel and seasonally flooded backwaters.
  - Flathead Grey Mullet (*Mugil cephalus*) – Common in brackish water segments subject to tidal influences.
  - Blue Crab (*Callinectes sesia* / *Callinectes sapidus*) – Inhabits the muddy benthic zones of the creek near the coastal margins.
- **Terrestrial Fauna:**
  - Common Rodents – House rat (*Rattus rattus*) and African pygmy mouse (*Mus minutoides*), typical of localized settlement edges and storage areas.
  - Reptiles – Rainbow lizard (*Agama agama*) and West African skink (*Mabuya perrotetii*), widely distributed across open grounds and perimeter walls.
  - Invertebrates – Garden insects, butterflies (Lepidoptera), and essential agricultural pollinators typical of disturbed secondary growth and coastal transition fringes.

4.5 Socio-Economic and Cultural Environment

This section presents the socio-economic and cultural baseline for the Badagry Axis Group 7, encompassing the three PHC facilities—APA, Igbogbele, and Farasime. 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.

4.5.1 Socio-Economic Overview of Badagry Axis

4.5.1.1 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:

Badagry is located in the western part of Lagos State, bordering the Republic of Benin. It lies along the coastal corridor and includes lagoon, wetland, and low-lying settlements. The area is strategically connected by road to other parts of Lagos State while also retaining strong cultural and maritime links.

Population and Demographics:

Badagry has a growing and diverse population composed mainly of Yoruba subgroups, including indigenous coastal and riverine communities, alongside migrants from other parts of Nigeria and neighbouring West African states. Population growth has increased demand for healthcare, water, roads, and social infrastructure.

Traditional Leadership and Governance:

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

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

For ESIA purposes, the traditional rulership institution in Badagry is a key socio-cultural stakeholder, especially in community engagement, project acceptance, and conflict management.

4.5.1.2 Comparative Socio-Economic Baseline by Community

The socio-economic baseline varies significantly across the three communities due to differences in location, access to resources, and economic activities (Table 4.12).

Table 4.12: Comparative Socio-Economic Baseline – Project-Affected Communities

Parameter	APA	Igbogbele	Farasime
Location Context	Coastal/lagoon-side settlement	Wetland-adjacent community	Semi-rural inland fringe
Estimated Population	8,000 – 15,000	6,000 – 12,000	5,000 – 10,000
Settlement Type	Riverine/coastal	Wetland/rural	Semi-rural agrarian
Dominant Ethnic Group	Yoruba (Badagry/Egun mix)	Yoruba (Badagry/Egun mix)	Yoruba
Other Ethnic Groups	Egun, Igbo, Hausa	Egun, Igbo, Hausa	Igbo, Hausa, Egun
Main Livelihoods	Fishing, trading, transport	Fishing, farming, petty trade	Farming, trading, artisanal work
Key Economic Feature	Lagoon-based economy	Wetland-based economy	Agrarian economy
Infrastructure Level	Low	Low	Moderate
Road Condition	Poor/flood-prone access	Poor/wet-season constrained	Mixed
Water Supply Source	Boreholes, shallow wells	Boreholes, wells	Boreholes, vendors
Electricity Supply	Irregular grid supply	Irregular grid supply	Irregular grid supply
Drainage Condition	Very poor	Poor	Moderate to poor
Environmental Setting	Coastal/wetland zone	Wetland/low-lying zone	Inland agricultural fringe
Key Environmental Issue	Flooding and lagoon sensitivity	Wetland degradation	Land conversion and runoff
Traditional Leadership	Baale/chieftaincy structure	Baale/chieftaincy structure	Baale/chieftaincy structure
Development Pressure	High	Medium to high	Medium

4.5.2 Socio-Economic Receptors Analysis

4.5.2.1 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:

- APA and Igbogbele, with their coastal and wetland exposure, are particularly sensitive to temporary disruptions in road access, flooding, noise, and construction disturbances
- A large share of residents depend on local roads and services daily
- Population density is high in APA, moderate in Igbogbele, and low to moderate in Farasime

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

4.5.2.2 Livelihood Receptors

Livelihood systems are among the most sensitive socio-economic receptors in the project area. Economic activities include fishing, farming, petty trading, transport services, and artisan work, all of which depend on stable access to land, roads, markets, and environmental resources (Table 4.13).

Table 4.13: Livelihood Receptors by Community

Community	Key Livelihoods	Sensitivity Drivers
APA	Fishing, trading, transport	Access restrictions, coastal flooding, potential disruption to lagoon-related activities
Igbogbele	Fishing, farming, petty trade	Wetland sensitivity, access disruption, livelihood dependence on natural resources
Farasime	Farming, trading, artisanal work	Construction disturbance, access constraints, reduced customer patronage

Key Observations:

- Households depend on daily income-generating activities
- Fishing is the primary livelihood in APA and Igbogbele
- Farming dominates in Farasime
- Trading is important 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.

4.5.2.3 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 4.14).

Table 4.14: Community Infrastructure Receptors

Community	Infrastructure Level	Sensitivity Drivers
APA	Low	High sensitivity – poor access and drainage increase vulnerability
Igbogbele	Low	Very high sensitivity – wetland setting and limited alternatives
Farasime	Moderate	Moderate sensitivity

Key Observations:

- Road infrastructure is especially sensitive as it supports economic mobility, access to services, and social interaction
- Temporary obstruction of roads or access routes during construction may significantly affect communities with already poor connectivity
- APA and Igbogbele exhibit the highest infrastructure sensitivity

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

4.5.2.4 Vulnerable Groups as Receptors

Vulnerable groups within the project area include women, children, the elderly, 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 4.15).

Table 4.15: Vulnerable Groups and Sensitivity Drivers

Vulnerable Group	Sensitivity Drivers
Women (petty traders)	Income loss if access to markets is disrupted
Children	Construction-related traffic and safety risks
Elderly & Persons with Disabilities	Mobility challenges where construction restricts access to roads and social services
Low-income households	Vulnerable 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.

4.5.2.5 Environmental Resource Receptors

Environmental resources that support socio-economic wellbeing—such as farmland, wetlands, drainage channels, and water bodies—are key receptors within the project area (Table 4.16).

Table 4.16: Environmental Resource Receptors

Community	Environmental Resources	Sensitivity Drivers
APA	Wetlands, lagoon resources	Extremely sensitive – underpin fisheries-based livelihoods and local environmental stability
Igbogbele	Wetlands and drainage channels	Sensitive to disturbance and pollution
Farasime	Farmland	Sensitive to land take and physical disturbance

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

4.5.2.6 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 4.17).

Table 4.17: Social and Cultural Institution Receptors

Community	Traditional Leadership
APA	Baale/chieftaincy structure
Igbogbele	Baale/chieftaincy structure
Farasime	Baale/chieftaincy structure

Key Observations:

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

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.

4.5.2.7 Summary of Receptor Sensitivity

Table 4.18 provides a Summary of Socio-Economic Receptor Sensitivity.

Table 4.18: Summary of Socio-Economic Receptor Sensitivity

Receptor Category	Sensitivity Level	Basis of Sensitivity
Population Receptors	High	Dense populations; limited alternatives; dependence on local infrastructure
Livelihood Receptors	High	Heavy dependence on fishing, farming, trading; income generated daily
Community Infrastructure Receptors	Moderate–High	Existing deficits; poor drainage; limited access routes
Vulnerable Groups	High	Limited adaptive capacity; dependence on PHC services and daily income
Environmental Resource Receptors	High	Dependence on natural resources for livelihoods; wetland vulnerability
Social/Cultural Institutions	Moderate	Importance for community engagement; risk of resistance if excluded

4.5.2.8 Community Sensitivity Ranking

Table 4.19 provides a summary of the Community Sensitivity Ranking – Badagry Axis

Table 4.19: Community Sensitivity Ranking – Badagry Axis

Community	Overall Sensitivity	Key Drivers
APA	Very High	Coastal vulnerability, weak infrastructure, dependence on fishing, flood-prone access
Igbogbele	Very High	Wetland exposure, weak infrastructure, livelihood dependence on natural resources
Farasime	Moderate–High	Agrarian livelihoods, access sensitivity, community infrastructure limitations

Implications for Project Design:

The socio-economic receptors within the Badagry Axis Group 7 are moderately to highly sensitive, emphasizing the need for:

1. Careful construction planning – to avoid temporary disruptions
2. Targeted stakeholder engagement – with Baales, community leaders, women's groups, and youth
3. Livelihood protection measures – for fishers, farmers, traders, and transporters
4. Vulnerable group safeguards – for children, elderly, women, and persons with disabilities
5. Environmental resource protection – especially for APA's lagoon/coastal ecosystems and Igbogbele's wetland setting

4.6 Site-Specific Socio-Economic Baseline

4.6.1 Human Settlements

Table 4.20 shows the Human Settlement Characteristics by Site

Table 4.20: Human Settlement Characteristics by Site

Site	Settlement Type	Population Density	Description
APA	Semi-Urban / Linear	High	Characterized by a mix of permanent block structures and commercial frontage. The settlement is tightly clustered along the primary access road, with residential dwellings immediately abutting the PHC perimeter.
Igbogbele	Nucleated Rural	Medium	A traditional settlement pattern centered around communal spaces and the Baale's palace. Dwellings are a mix of sandcrete blocks and local materials, with a high concentration of petty trading at the settlement core.
Farasime	Coastal / Dispersed	Low to Medium	A spread-out settlement layout following the lagoon shoreline. It is primarily a fishing and artisanal community with significant open spaces between residential clusters and the lagoon buffer.

Figure 4.8 presents a comparative baseline overview of settlement morphology and population density across the three Group 7 Primary Health Centre (PHC) host communities—Apa, Igbogbele, and Farasime—within the Badagry Axis. 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 Apa, the nucleated rural pattern centered around communal spaces in Igbogbele, and the dispersed coastal settlement aligned with the lagoon shoreline in Farasime. Together, these maps provide a clear understanding of settlement structure, density variations, and community organization essential for contextualizing project design and social impact analysis.

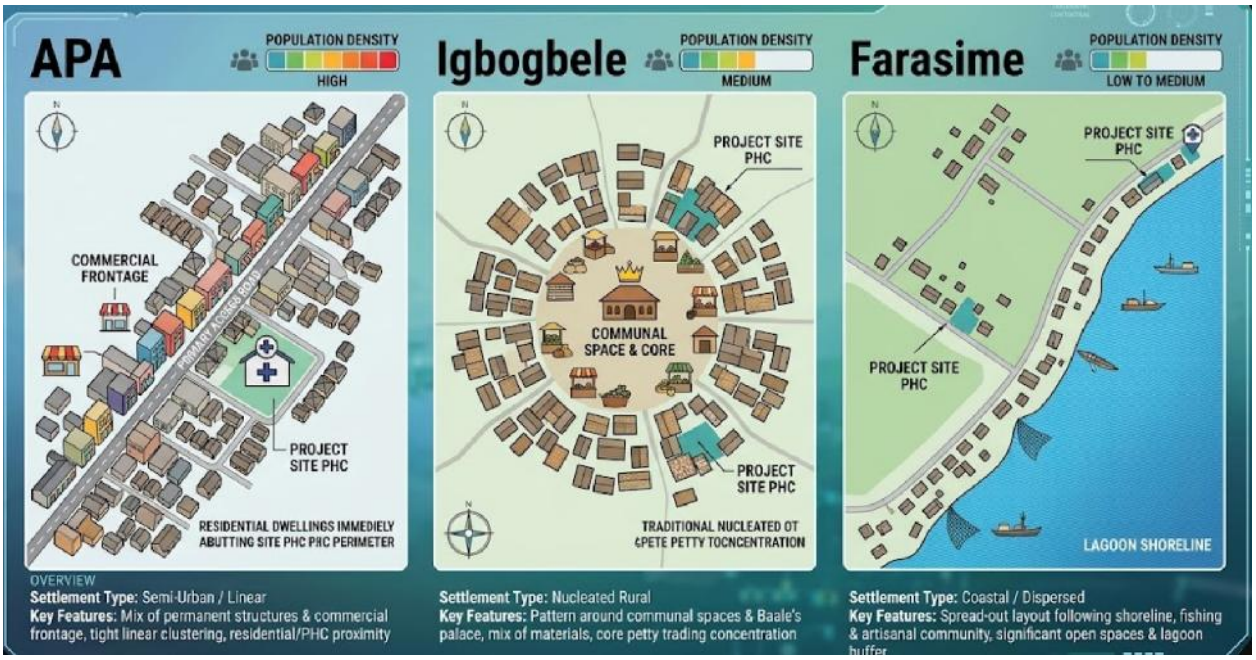


Figure 4.8: Settlement Map and Population Data – Badagry Axis Group 7]

4.6.2 Demographics

This subsection presents an integrated baseline profile of the three Group 7 Primary Health Centre (PHC) catchment communities—Apa, Igbogbele, and Farasime—within the Badagry Axis. 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 Apa, nucleated rural clustering in Igbogbele, and dispersed coastal settlement in Farasime—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 4.21 provides a summary of demographic, settlement, and socio-economic profile for the three Group 7 PHC catchment communities.

Tabe 4.21 Integrated Population, Settlement, and Socio-Economic Sensitivity Matrix for Group 7 PHC Catchment Communities (Badagry Axis)

Parameter	APA PHC	Igbogbele PHC	Farasime PHC	Axis Total / Summary
Estimated Population	8,000–15,000	6,000–12,000	5,000–10,000	42,500–48,000
% of Catchment Population	~33%	~28%	~22%	100%
Population Density	High	Medium	Low–Medium	—
Settlement Type	Semi-Urban / Linear	Nucleated Rural	Coastal / Dispersed	—
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/Egun mix)	Yoruba (Badagry/Egun mix)	Yoruba	Ogu (Egun), Awori, Yoruba

Other Ethnic Groups	Egun, Igbo, Hausa	Egun, Igbo, Hausa	Igbo, Hausa, Egun	—
Literacy Rate	68%	68%	68%	68%
Unemployment Rate	~18%	~18%	~18%	~18%
Main Economic Activity	Fishing, trading, transport	Fishing, farming, petty trade	Farming, trading, artisanal work	—
Ecosystem Dependence	>60% (lagoon)	>60% (wetland)	>50% (creek/agricultural)	—
Key Markets	Apa Central Market	Igbogbele Local Market	Farasime Waterfront Fish Market	—
Infrastructure Level	Low	Low	Moderate	—
Road Condition	Poor, flood-prone	Poor, wet-season constrained	Mixed	—
Drainage Condition	Very poor	Poor	Moderate–poor	—
Flood Risk	Moderate (coastal erosion)	High (flood-prone zone)	High (creek waterfront)	—
GBV Risk Level	Medium–High	Medium–High	Medium	—
Overall Sensitivity	Very High	Very High	Moderate–High	—

Key Observations

- Population Distribution: APA is the largest settlement, followed by Igbogbele and Farasime.
- Youthful Demographics: All three communities have a high youth proportion (35–40%).
- Livelihood Dependence: Strong reliance on lagoon, wetland, and creek ecosystems for income.
- Infrastructure Gaps: APA and Igbogbele show low infrastructure levels; Farasime is moderately serviced.
- Flood & Drainage Vulnerability: Igbogbele and Farasime face high flood risk; APA experiences moderate coastal erosion.
- Sensitivity: APA and Igbogbele are classified as Very High sensitivity zones; Farasime is Moderate–High.

Figure 4.9 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.

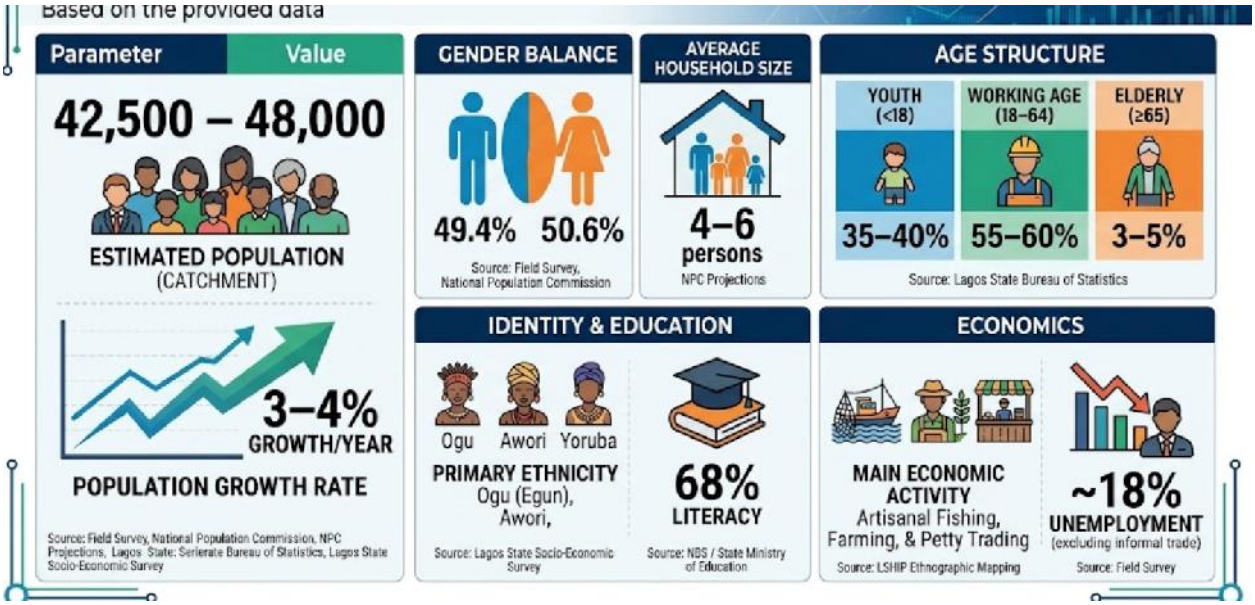


Figure 4.9: Baseline Demographic and Economic Profile of the Regional Catchment Area

4.6.3 Livelihoods

Livelihoods across the Badagry Axis Group 7 are shaped by a mix of fishing, trading, artisanal work, transport services, and farming. Vulnerability to project impacts varies by site, depending on land take, displacement risks, access disruption, and exposure to construction-related disturbances.

Table 4.22: Livelihood Profile by Site

Site	Primary Livelihoods	Secondary Livelihoods	Vulnerability to Project
APA	Artisanal Fishing & Coconut Farming: Highly dependent on the lagoon and traditional coconut groves	Boat Transport & Local Gin Processing: Small-scale ferry services and traditional distilling	Medium to High – access disruption, coastal sensitivity
Igbogbele	Subsistence Crop Farming: Primarily cassava, maize, and leafy vegetables for local markets	Petty Trading & Charcoal Production: Small roadside stalls and wood-based energy processing	High – wetland sensitivity and access constraints
Farasime	Cross-Border Trade & Logistics: Movement of goods and petty commerce due to border proximity	Livestock Rearing & Artisanal Craft: Small-scale poultry and traditional mat/basket weaving	Medium – temporary access disruption and dust

Key Observations:

- Fishing and trading form the backbone of economic activity in APA and Igbogbele
- Farasime relies more on farming and local commerce
- All communities have a high reliance on natural resources and proximity to the coastal corridor
- Cross-border trade is significant for Farasime due to proximity to the Seme border

Figure 4.10 provides the Livelihood Vulnerability Assessment Map – Badagry Axis Group 7]

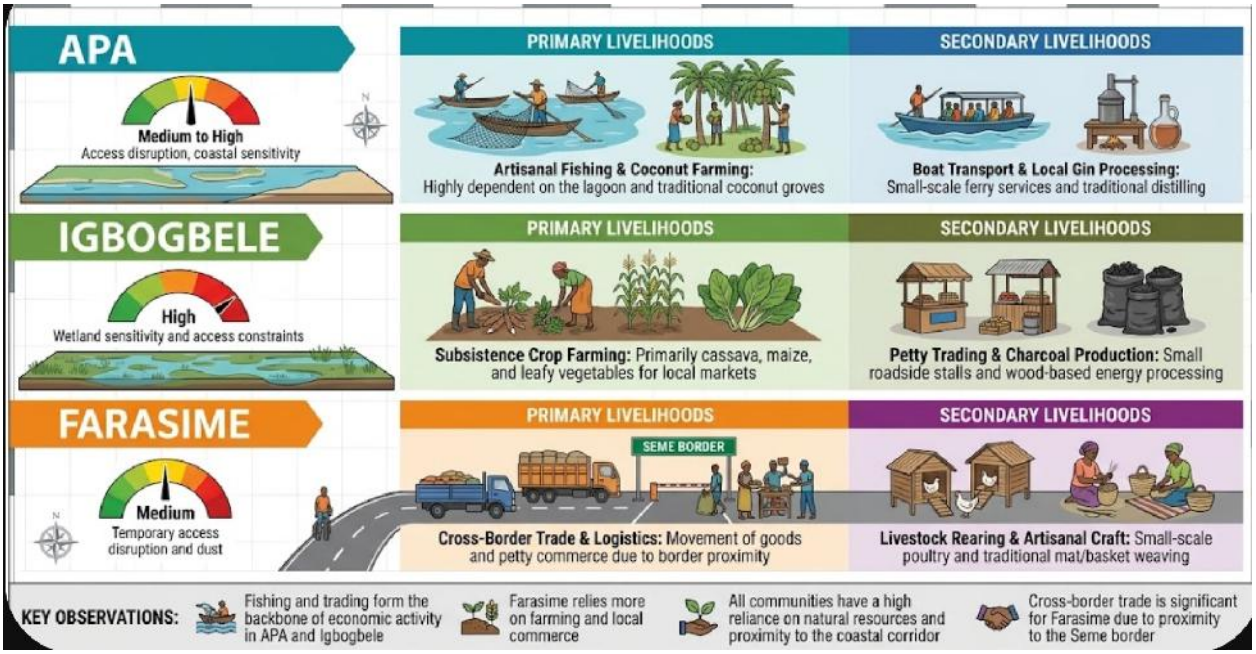


Figure 4.10: Livelihood Vulnerability Assessment Map – Badagry Axis Group 7]

4.6.4 Education, Literacy, and Skills

Education and Literacy:

Parameter	Value
Overall Literacy Rate	68% (formal education)
Primary/Secondary Schools	APA Community High School, Igbogbele Primary School, and other community schools
Vocational Skills	Skewed towards boat building, net making, traditional agriculture, and artisanal crafts

Skills Profile:

- Boat building and repair (APA, Farasime)
- Net making and fishing gear maintenance (APA, Igbogbele, Farasime)
- Traditional agriculture and farming (Igbogbele, Farasime)
- Petty trading and commerce (all sites)
- Artisanal crafts (mat/basket weaving, Farasime)

Implications:

- Limited formal education beyond primary level in some communities
- Vocational skills tied to natural resource-based livelihoods
- Need for skills training and capacity building as part of livelihood restoration

4.6.5 Social Organisations and Institutions

Traditional Institutions:

Community	Institution	Role
APA	Alapa of Apa (Palace)	Traditional governance, cultural leadership, dispute resolution
Igbogbele	Baale/Chieftaincy structure	Community leadership, land administration, cultural guidance
Farasime	Baale/Chieftaincy structure	Community leadership, cultural guidance, dispute resolution

Community-Based Organizations:

- Women's groups and associations (all sites)
- Youth associations (all sites)
- Fisher and trader associations (APA, Igbogbele, Farasime)
- Ward Health Committees (all sites)
- Community Development Associations (CDAs) (all sites)

Religious Institutions:

- Churches and mosques present in all communities
- Traditional religious sites (Zangbeto spots, shrines) in some areas

Implications for Project:

- Strong traditional institutions facilitate community engagement and project acceptance
- Women's and youth groups provide important channels for stakeholder engagement
- Fisher and trader associations are critical for livelihood protection and GRM

4.6.6 Gender and Social Inclusion

Gender Profile:

Parameter	Value
Gender Ratio (Female:Male)	0.98:1
Women in Workforce	Active in petty trading, fish processing, farming, and artisanal work
Female-Headed Households	Present, particularly in fishing communities (widows/separated)

Access to Healthcare	Women face barriers (cost, transport, childcare, lack of female staff)

Social Inclusion Considerations:

Group	Considerations
Women	• Primary caregivers and healthcare users • Active in informal economy (trading, fish processing) • Barriers to healthcare access (cost, transport, safety)
Youth	• Form 35–40% of population • High unemployment (~18%) • Limited formal employment opportunities
Elderly	• 3–5% of population • Mobility challenges • Dependence on family and community support
Persons with Disabilities	• Limited accessible infrastructure • Challenges accessing healthcare and services
Low-Income Households	• Vulnerable to economic shocks • Dependence on daily income-generating activities
Migrants/Trans-Border Workers	• Present in APA due to border proximity • May face barriers to healthcare and services

4.6.7 Household Economic Valuation and Ecosystem Dependence

Ecosystem Dependence:

Community	Primary Ecosystem Service	% Household Income from Ecosystem
APA	Fisheries (lagoon), flood regulation, water supply	>60% directly from lagoon ecosystem
Igbogbele	Fisheries, farmland, wetland resources, flood regulation	>60% directly from wetland ecosystem
Farasime	Fisheries (Badagry Creek), farmland, water supply	>50% directly from creek/agricultural ecosystem

Key Markets:

- Apa Central Market – primary trading hub for APA
- Igbogbele Local Market – local trading and petty commerce
- Farasime Waterfront Fish Market – primary fish market for Farasime

Implications:

- Over 60% of household income in Farasime and Igbogbele is directly derived from the Badagry Creek ecosystem (predominantly fisheries and sand dredging)
- Protection of Badagry Creek water quality is critical to economic survival
- Construction activities must avoid polluting water bodies or disrupting access to fishing grounds

4.6.8 Security, Conflict, and Social Stability

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 routes near Farasime • Poor lighting in some areas • Isolated pathways • Weak police response in remote areas

Security Measures:

Site	Risk Level	Description	Mitigation
APA	Medium	Coastal access; movement around lagoon edge; border proximity	Guards; fencing; lighting; community liaison
Igbogbele	Medium	Wetland/peri-rural interface	Guards; fencing; lighting
Farasime	Low	Semi-rural settlement	Guards; fencing; lighting

Social Stability Factors:

- Strong traditional leadership (Alapa of Apa, Baales) provides governance and dispute resolution
- Community associations (CDAs, women's groups, youth groups) support social cohesion
- Cross-border trade routes near Farasime occasionally attract customs enforcement but do not affect social stability
- Civil conflict is historically low

4.6.9 Land Tenure and Ownership

Table 4.23: Land Tenure and Ownership

Site	Tenure Type	Evidence	Implications
APA	Government Owned / Gazetted Land	Verified Government Ownership / Technical Selection Records	Low risk of land-title disputes; facilitates immediate project commencement without need for RAP
Igbogbele	Government Owned / Gazetted Land	Verified Government Ownership / Site Gazetting	Secure tenure ensures long-term project sustainability and prevents legal delays associated with communal land claims
Farasime	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

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 occurred (if applicable)

4.6.10 Resettlement Baseline (AfDB OS2)

The resettlement baseline screening confirms:

Parameter	Finding
Physical Displacement	None – zero residential structures affected
Economic Displacement	None – informal vendors, roadside traders, 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

PAP Categories and Asset Inventory:

Site	PAP Category	Number of PAPs	Structures Affected	Businesses Affected	Farmland (ha)	Economic Trees	Vulnerable PAPs
APA PHC	None	0	0	0	0	0	N/A
Igbogbele PHC	None	0	0	0	0	0	N/A
Farasime PHC	None	0	0	0	0	0	N/A

No RAP/LRP Required:

As no physical or economic displacement requiring relocation or livelihood restoration has been identified, no Resettlement Action Plan (RAP) or Livelihood Restoration Plan (LRP) is required for the Badagry Group 7 Axis.

Worker's Camp Clarification:

For the avoidance of doubt, no worker's camp will be established for the Badagry Group 7 PHC facilities. The peak workforce of 85–105 workers will be accommodated in local rental housing within the project communities, in line with the local-hiring priority (≥50% of unskilled labour from host LGAs). The Labour Influx Management Plan (Appendix 2.4) addresses worker conduct, local hiring, and community liaison, but does not include a campsite component. Any reference to "worker camp rules" in this ESIA refers to the Worker Code of Conduct (Appendix 11) and site rules applicable to all workers, regardless of accommodation arrangement.

4.6.11 Social Services, OHS and Waste Management

Social Services Baseline

Social services across the Badagry Axis Group 7 are available but uneven in quality, especially in coastal and wetland communities. 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 4.24

Table 4.24: Social Services Baseline

Service	Availability	Gaps Identified	LSHIP Contribution

Markets	Apa Central Market; Igbogbele Local Market; Farasime Waterfront Fish Market	Lack of basic health posts within market clusters for immediate first aid or health screening	Improved proximity to modernised healthcare for market traders and patrons; potential for mobile health outreach
Health Centres	Primary Health Centres (PHCs) established in APA, Igbogbele, and Farasime	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 APA)
Schools	Primary and secondary schools within 1–5 km- None	Limited formal access in some areas within the project locations; structural limitations; limited synergy between school health programs and PHCs	Strengthening of referral network between schools and modernised PHCs for school health checks and immunisation
Water Sources	Existing manual boreholes or shallow wells scross the 3 locations	Frequent non-functionality or contamination risks; 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	Primary access via Lagos-Badagry Expressway for the 3 locations	Rural access roads to PHC sites narrow, unpaved, flood-prone	Advocacy for site-access improvements; better emergency transport visibility
Waste Collection	Reliance on makeshift pits or	Significant biohazard risks; inadequate medical waste	Implementation of standardized medical waste

	rudimentary disposal across the 3 locations	segregation; unsafe disposal methods	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 7 facilities reflect their typology as small rural Primary Healthcare Centres with limited clinical services, basic infrastructure, and modest daily operations. APA PHC (new construction), Igbogbele PHC (refurbishment), and Farasime PHC (refurbishment) all operate at a scale typical of rural PHCs in Lagos State, and therefore exhibit predictable, low-intensity OHS risks and small-volume waste streams consistent with such facilities. Table 4.25a and Table 4.25b summarise the baseline conditions across the three locations. These ranges reflect the operational realities of small rural PHCs and provide a realistic understanding of the OHS and waste-generation environment within the GPA. The facilities do not generate the scale or complexity of risks associated with general hospitals, and the baseline conditions are inherently limited and proportionate to the facility typology and project scope.

Table 4.25a: Occupational Health & Safety Baseline

Facility	Project Type	Typical OHS Risk Types	Indicative Magnitude (Facility-Scale)
APA PHC	New Construction (Elevated Platform)	- Routine clinical handling - Minor sharps management - Slip/fall hazards - Chemical exposure (disinfectants) - Electrical safety - Heat stress - Construction-specific risks: working at height, dust/noise, machinery operation	- Low-intensity clinical risks - Small construction crew (10–20 workers) - Moderate construction-specific hazards typical of PHC-scale works
Igbogbele PHC	Refurbishment	- Routine clinical handling - Minor sharps management - Manual lifting - Slip/fall hazards - Chemical exposure - Electrical safety - Refurbishment risks: dust inhalation, trip hazards, minor demolition debris	- Low-intensity clinical risks - Small refurbishment team (5–10 workers) - Localised, low-risk refurbishment activities

Farasime PHC	Refurbishment	- Routine clinical handling - Minor sharps management - Manual lifting - Slip/fall hazards - Chemical exposure - Electrical safety - Refurbishment risks similar to Igbogbele	- Low-intensity clinical risks - Small refurbishment team - Limited structural intervention

Table 4.25b: Waste Stream Baseline

Waste Type	APA PHC	Igbogbele PHC	Farasime PHC	Basis for Indicative Values
General Waste	5–15 kg/day	5–10 kg/day	5–10 kg/day	Typical PHC administrative & domestic waste
Infectious Healthcare Waste	2–5 kg/day	2–4 kg/day	2–4 kg/day	Outpatient services, immunization, minor procedures
Sharps Waste	0.1–0.3 kg/day	0.1–0.2 kg/day	0.1–0.2 kg/day	Limited injection/testing activities
Pharmaceutical Waste	<1 kg/month	<1 kg/month	<1 kg/month	Small drug inventories typical of rural PHCs
Construction Waste	1–3 tonnes total	N/A	N/A	PHC-scale new construction footprint
Refurbishment Waste	N/A	0.5–1 tonne total	0.5–1 tonne total	Tiles, fittings, minor concrete debris

4.6.12 Cultural Heritage

The Badagry Axis Group 7 is rich in historical and spiritual significance, with several landmarks located in the vicinity of the project sites. The table below outlines identified cultural heritage assets and recommended mitigation protocols.

Table 4.26: Cultural Heritage Assets and Mitigation

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

APA	Tangible / Institutional	Palace of the Alapa of Apa and ancient community shrines	Within 500m – 1km	High; Central to community's traditional governance and spiritual identity	Protected by Traditional Authority / Local Custom	Conduct formal consultation with the Alapa of Apa; ensure construction does not obstruct access
Igbogbele	Tangible / Spiritual	Zangbeto spots and ancestral burial grounds	Within 500m	High; Sacred spaces for traditional policing and ancestral veneration	Protected by Community Leadership / Traditional Custodians	Define clear site boundaries; implement a buffer zone to prevent encroachment during excavation
Farasime	Tangible / Spiritual	Traditional altars and sacred community trees	Within 250m	Medium-High; Local landmarks used for community rituals and shade	Protected by Local Custom	Brief site contractors on the sanctity of these trees/altars; prohibit felling of sacred trees
All Sites	Archaeological (Sub-surface)	Potential for 18th-century commercial/slave trade artifacts	Underneath project sites	High; Scientific and historical value	National Commission for Museums &	Implement a Chance Find Procedure; cease work and notify

					Monuments (NCMM)	authorities if artifacts are discovered

Key Observations:

- Reconnaissance confirmed no cultural heritage sites within 100 m of any PHC
- Heritage sites are located at distances of 250m to 1km from project footprints
- Excavation may uncover chance finds, requiring strict adherence to the project's Chance Finds Procedure Appendix 14.
- Traditional leadership and custodians play critical roles in heritage protection

Chance Finds Procedure:

In the event of chance finds during excavation:

1. **Stop work** immediately in the area of the discovery
2. **Secure the site** and prevent further disturbance
3. **Notify** the National Commission for Museums and Monuments (NCMM) and PIU within 24 hours
4. **Allow assessment** by heritage authorities before any further work
5. **Document** the find with photographs and GPS coordinates

4.6.13 Vulnerable Groups (AfDB OS7 / IFC PS7)

Key Finding: No Indigenous Peoples Identified

Under AfDB OS7 and IFC PS7 screening, no Indigenous Peoples as defined by those standards are identified in the Badagry Axis Group 7. Therefore, OS7/PS7 is **NOT TRIGGERED**.

Vulnerable Groups Present:

Group	Vulnerability Factors	Mitigation Measures
Women	Economic dependence on daily trading; barriers to healthcare access; GBV risks	Gender-sensitive design; GBV Action Plan; livelihood support; female GRM focal points
Children	Traffic risks during construction; child labour risks	Traffic Management Plan; prohibition of child labour in contracts
Elderly	Mobility challenges; healthcare access barriers	Disability-friendly design; accessible facilities

Persons with Disabilities	Limited accessible infrastructure	Universal design standards; ramps; accessible toilets
Low-Income Households	Economic shocks from temporary disruption	Livelihood Restoration Plan; income support
Migrants/Trans-Border Workers	Barriers to healthcare and services	Inclusive engagement; referral pathways

4.6.14 GBV/SEA/SH Baseline

GBV risks are elevated across coastal and peri-urban sites due to poor lighting, isolated paths, weak reporting systems, and economic vulnerability.

Table 4.27: Key GBV Risk Factors

Risk Factor	Description	Sites	Risk Level
Labour Influx	120–240 workers during construction	All sites	Medium
Poor Lighting	Inadequate street lighting	Rural/peri-urban	Medium–High
Isolated Paths	Unlit footpaths in rural areas	Rural/peri-urban	Medium–High
Lack of Female Staff	Few female workers in construction	All sites	Medium
No Confidential Reporting	No GBV channels or survivor support	All sites	High
Economic Vulnerability	Women traders/fishers/farmers	APA, Igbogbele	Medium–High
Substance Abuse	Alcohol/drug use in some localities	Some localities	Medium
Cultural Norms	Gender inequality in rural areas	Rural sites	Medium
Weak Police Response	Underreporting due to poor response	All sites	High
Displacement	PAPs or livelihood users affected	Site-specific	Medium

Table 4.280: GBV Risk Rating by Site

Site	Overall Risk
APA	Medium–High
Igbogbele	Medium–High
Farasime	Medium

Key Risk Scenarios:

1. Worker-Community SEA: Workers offering money/goods/jobs for sex (highest at APA due to trans-border labour influx)
2. Worker-Worker SH: Quid pro quo harassment in the workplace
3. GBV Against Vulnerable Groups: Women/girls on isolated paths (poor lighting is a common factor)
4. Child Sexual Abuse: Zero tolerance – CoC prohibition on sexual activity with minors
5. Lack of Confidential Reporting: Survivors fear retaliation – compounded by border proximity at Igbogbele
6. Economic Exploitation: Vulnerability to SEA for fishers/traders at Farasime and APA
7. Survivor Reports but No Action: GRM fails to respond -> re-traumatisation

GBV Action Plan:

A comprehensive GBV/SEA/SH Action Plan is provided in **Chapter 9**, addressing prevention, response, reporting channels, referral pathways, and monitoring.

4.6.15 Summary of Socio-Economic Baseline Findings

The socio-economic baseline assessment for the Badagry Axis Group 7 identifies the following key findings:

Theme	Key Findings
Population	42,500–48,000 residents across catchment areas; youthful population (35–40% under 18 years); gender balance (49.4% male / 50.6% female)
Settlement Types	Semi-urban/linear (APA); nucleated rural (Igbogbele); coastal/dispersed (Farasime)
Ethnicity	Yoruba (Badagry/Egun mix), with migrant populations (Igbo, Hausa, Egun)
Livelihoods	Fishing (APA, Igbogbele); farming (Igbogbele, Farasime); trading (all sites); cross-border trade (Farasime)
Ecosystem Dependence	>60% of household income directly derived from Badagry Creek ecosystem (fisheries)
Markets	Apa Central Market; Igbogbele Local Market; Farasime Waterfront Fish Market
Literacy	68% formal education; vocational skills in boat building, net making, agriculture

Infrastructure	Poor/flood-prone access; irregular electricity; limited water treatment; inadequate waste management
Land Tenure	Government-owned (APA, Igbogbele, Farasime) – no tenure disputes
Resettlement	No physical displacement; potential economic displacement for informal vendors/traders
Cultural Heritage	Palace of Alapa of Apa; Zangbeto spots; ancestral burial grounds; traditional altars
Vulnerable Groups	Women, children, elderly, persons with disabilities, low-income households, migrants
GBV Risk	Medium-High (APA, Igbogbele); Medium (Farasime)
Security	Low to moderate risk; social stability high; strong traditional institutions

Overall Sensitivity Ranking:

Site	Overall Sensitivity	Key Drivers
APA	Very High	Coastal vulnerability, weak infrastructure, dependence on fishing, flood-prone access
Igbogbele	Very High	Wetland exposure, weak infrastructure, livelihood dependence on natural resources
Farasime	Moderate–High	Agrarian livelihoods, access sensitivity, community infrastructure limitations

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, monitoring requirements, and GBV safeguards in subsequent chapters.

CHAPTER 5 IMPACT ASSESSMENT

This chapter presents the assessment of potential environmental and social impacts associated with the three PHC facilities in Group 7 (Badagry Axis). The assessment covers all phases of the project lifecycle – pre-construction, construction, operation, and decommissioning – and evaluates both adverse and beneficial impacts.

The analysis follows:

- AfDB Integrated Safeguards System (ISS) 2023/2024 – OS1 (Environmental Assessment), OS2 (Involuntary Resettlement), OS3 (Biodiversity), OS4 (Pollution Prevention), OS5 (Labour, OHS, GBV), OS6 (Climate Change), OS7 (Community Health, Safety and Security), OS8 (Cultural Heritage) (African Development Bank, 2023)
- IFC Environmental, Health & Safety (EHS) Guidelines (International Finance Corporation, 2012)
- WHO Healthcare Waste and IPC Standards (World Health Organisation, 2014)
- ILO Labour and OHS Conventions (International Labour Organisation, 1981, 1998)
- FMEnv ESIA Act CAP E12 LFN 2004 (Federal Ministry of Environment, 2004)
- NESREA Regulations (National Environmental Standards and Regulations Enforcement Agency, 2009, 2011, 2021)

It is important to note that the APA, Igbogbele, and Farasime facilities are small rural primary healthcare centres with limited service footprints and basic infrastructure. Consequently, they do not generate the scale or complexity of waste, wastewater, hazardous materials, or operational risks typically associated with general hospitals. This facility typology explains both the modest nature of potential impacts and the absence of advanced management systems in the baseline.

The impact assessment for the Group 7 facilities must be interpreted within the context of the facility typology. The APA, Igbogbele, and Farasime Primary Healthcare Centres are small rural PHCs with modest service footprints, limited infrastructure, and low-intensity clinical operations. Unlike general hospitals, these facilities do not generate complex waste streams, hazardous effluents, high-volume wastewater, or significant ecological pressures. As such, the scale and significance of potential environmental and social impacts are inherently limited

5.1 METHODOLOGY

Impact identification utilised a combination of baseline-impact interaction matrices (linking activities to the receptors defined in Chapter 4), site reconnaissance findings (24-27 February 2026), stakeholder consultations, and expert judgement. Significance was determined based on the interaction of impact magnitude (negligible to large) and receptor sensitivity (low to high).

Table 5.1 provides a consolidated summary of all baseline environmental and socio-economic receptors identified in Chapter 4, outlining their sensitivity levels and corresponding section references to support the impact assessment methodology presented in Chapter 5.

Table 5.1: Baseline Receptors Identified in Chapter 4

Receptor Category	Specific Receptors	Sensitivity	Chapter 4 Reference
Physical Environment	Badagry Creek (water quality)	High	Section 4.4.7
	Air quality (residential receptors)	Medium-High	Section 4.4.2
	Noise receptors (PHC staff, patients)	Medium-High	Section 4.4.3
	Soil quality (agricultural land)	Medium	Section 4.4.8
Biological Environment	Aquatic fauna (fish, crabs)	High	Section 4.4.9
	Aquatic flora (mangroves)	Medium-High	Section 4.4.9
	Ecosystem services (fisheries)	High	Section 4.4.9
Socio-Economic	Resident populations (42,500-48,000)	High	Section 4.6.2
	Livelihood systems (fishing, farming)	High	Section 4.6.3
	Vulnerable groups	High	Section 4.6.13
	Cultural heritage	Medium	Section 4.6.12

The impact assessment methodology proceeds through the main stages of: Impact Identification, where inputs from consultations and reconnaissance are gathered; Determine Impact Characteristics, which

define magnitude, duration, extent, and likelihood; and Determine Receptor Sensitivity, providing contextual examples from the Badagry Axis (e.g., High for Badagry Creek and riverine margins; High for the confirmed-ACM structure at Igbogbele; Medium for common terrestrial species along the Owode-Apa corridor).

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. Figure 5.1 provides a visual explanation of this impact assessment methodology.

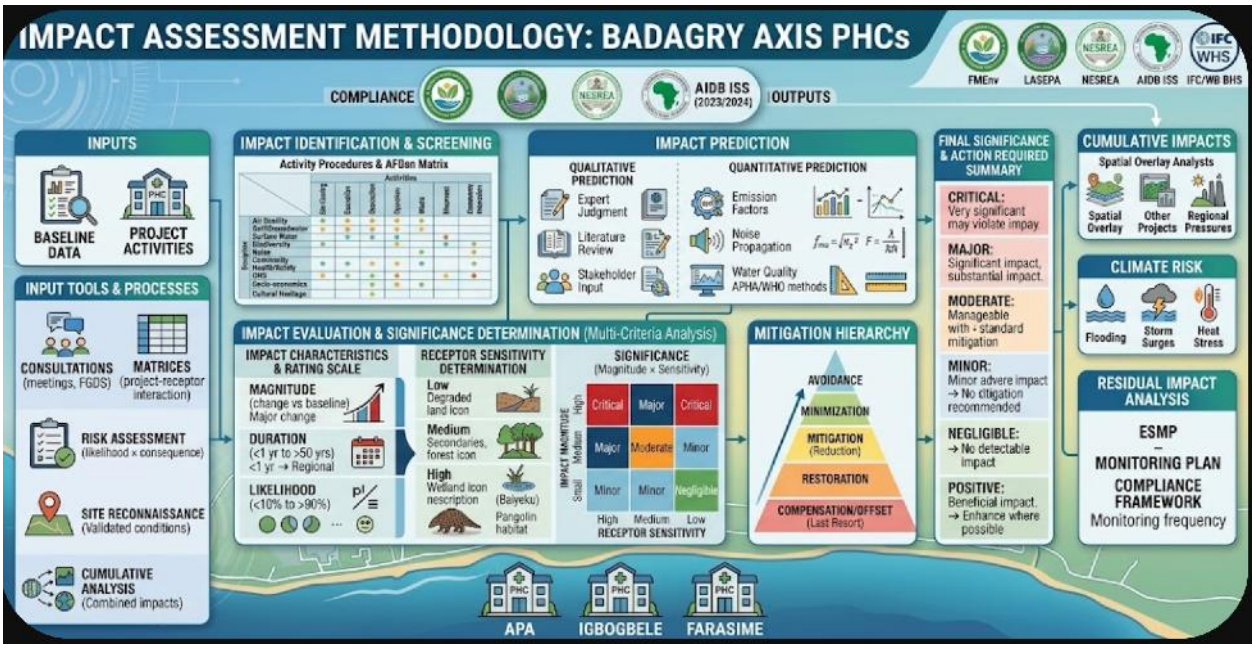


Figure 5.1:Impact Assessment Methodology

Impact Significance

The matrix below provides a unified colour-coded interpretation of impact significance levels used throughout the ESIA, clarifying how each colour corresponds to the severity of potential project impacts and the required mitigation response.

Colour	Significance Level	Description / Required Action
● **Critical**	Very significant adverse impact	Must be avoided or fully mitigated with offsets; highest priority for management.
□ **Major**	Significant adverse impact	Must be mitigated to at least Moderate; high-priority intervention required.

□ **Moderate**	Moderate adverse impact	Manageable with standard mitigation measures; medium-priority action.
□ **Minor**	Minor adverse impact	Mitigation recommended; low-priority action.
○ **Negligible**	No detectable impact	No mitigation required; monitor only.
● **Positive**	Beneficial impact	Enhance where possible; represents an opportunity.

5.2 Project Phases Considered

Figure 5.2 provides the various stages of the Project – pre-construction (6-12 months from Q2 2026), construction (12-18 months per facility, staggered across the axis), operation (50+ years), and decommissioning (end of life, per Chapter 8 Part B).

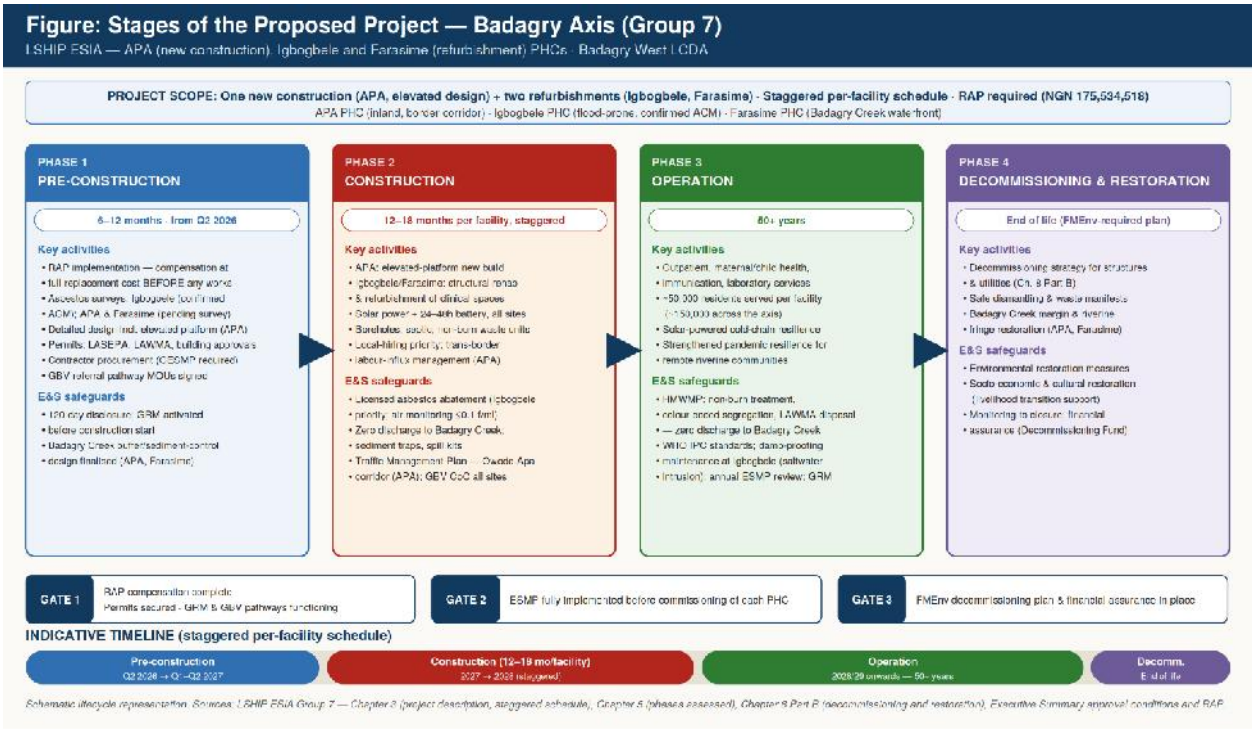


Figure 5.2: Stages of the Proposed Project

5.3 Detailed Impact Assessment (Unmitigated Scenario)

5.3.1 Pre-construction Phase Impacts

The primary activities during this phase involve final planning, site investigation, and land preparation. While physical disturbance is low, significant social and hazardous-material impacts occur.

Hazardous Materials (OS4): An unmitigated risk of Critical significance exists at Igbogbele, where the older structure carries confirmed legacy Asbestos-Containing Materials (ACM) – not merely suspected. Uncontrolled roof-replacement activities could release airborne fibres (>0.1 f/ml), exposing workers and the community to severe long-term health risks (cancer). At APA and Farasime, aged infrastructure likely containing hazardous materials is flagged as an unmitigated risk factor requiring pre-construction survey confirmation before any demolition works. Table 5.2a shows the Pre-Construction Phase Impact Assessment

Table 5.2A: Unmitigated Environmental and Social Impacts – Pre-Construction Phase

Impact Category	Impact Description	Sites	Impact Characteristics	Receptor Sensitivity	Significance
Hazardous Materials	Asbestos fibre release during demolition (confirmed ACM at Igbogbele; suspected at APA/Farasime)	Igbogbele (Critical); APA, Farasime (Major)	Magnitude: Large; Duration: Long-term; Extent: Site; Likelihood: High	High (worker/community health)	● Critical
Resettlement	Livelihood disruption for PAPs	All sites	Magnitude: Medium; Duration: Temporary; Extent: Site; Likelihood: High	High (ecosystem-dependent livelihoods)	□ Major

5.3.2 Construction Phase Impacts

The 12-18 month per-facility construction period (staggered across the axis) represents the peak intensity of physical disturbance and labour influx, generating numerous moderate to major unmitigated impacts.

Physical Environment Impacts (OS4)

- Air Quality: Generation of dust (PM10, PM2.5) from earthworks and unpaved access presents a Moderate to Major unmitigated impact. Igbogbele SP1 already exceeds baseline limits (PM10

168.8 ug/m3; PM2.5 116.7 ug/m3; AQI 206) against a localized source, while SP2-SP3 at the same facility and both sampling points at APA and Farasime remain low. Construction may push localized levels further during the dry season, particularly at Igbogbele.

- Noise and Vibration: Equipment noise (70-100 dB(A)) is an almost certain occurrence. Unmitigated, this compounds an already non-compliant baseline at all three APA sampling points (57.7-63.3 dB(A)) and at Igbogbele SP2 (59.9 dB(A)) and Farasime SP3 (59.9 dB(A)), resulting in a Moderate to Major impact, especially at APA, where daytime readings already exceed the 55 dB(A) guideline corridor-wide.
- Soil Erosion & Sedimentation: Earthworks during rainy periods create a Moderate to Major unmitigated risk, with sediment runoff threatening Badagry Creek margins at APA and Farasime and the flood-prone terrain at Igbogbele.
- Water Quality: Badagry Creek and its riverine margins are highly vulnerable receptors. Sediment runoff, concrete wash water (pH 11-13), and fuel spills present a Critical unmitigated impact threat – the axis's own Executive Summary names discharge of medical and construction waste into Badagry Creek as a Critical unmitigated impact, given the creek's centrality to fisheries and cross-border trade.
- Hydrological Impacts: Localised flooding due to soil compaction and temporary obstruction of natural drainage. Sediment runoff into Badagry Creek from earthworks. Groundwater intrusion during foundation excavation. Increased erosion risk if vegetation is cleared near the creek.
- Sensitivity of the Hydrological Environment: Badagry Creek is a critical receptor because: It supports fishing livelihoods, It is prone to tidal flooding and erosion, It is already environmentally stressed (organic pollution, coliforms, low DO). The health facility will serve a dispersed rural population with limited alternatives. This makes hydrological stability essential for continuous healthcare delivery.

Biological Environment Impacts (OS3)

- Vegetation & Habitat Loss: Permanent clearing presents varying impacts. Farmland and residential-plot loss at Farasime is a Minor to Moderate unmitigated impact, while any disturbance to Badagry Creek's riverine and wetland-fringe margins (at Farasime and the Igbogbele coastal fringe) carries Major significance given their role in flood attenuation and fisheries support.
- Species and Ecosystem Services: Clearing activities present a Moderate to Major unmitigated risk to creek-margin biodiversity and the ecosystem services (fisheries, flood regulation) that the

catchment communities depend on, should works proceed without pre-clearance ecological surveys.

Socio-Economic, Health, and Safety Impacts (OS5)

- OHS: Construction workers face Major unmitigated risks from falls, electrocution, machinery accidents, and heat stress. Uncontrolled asbestos exposure during roof replacement at Igbogbele is a Critical unmitigated risk.
- Community Health and Safety: Increased construction traffic, noise, dust, and restricted access present a Moderate to Major unmitigated impact, with traffic risks highest at APA due to its location on the Owode-Apa corridor and its role as the axis's high-patient-load anchor from cross-border demand. Delaying emergency response due to blocked access is a Minor risk.
- Labour Influx: The axis's staggered per-facility workforce places pressure on limited local services, compounded at APA by trans-border labour mobility across the nearby Nigeria-Benin border (Seme crossing), which may create social conflict and complicate worker-conduct screening. Unmitigated, this is a Major impact.
- Livelihoods: Beyond land take, construction activities present Moderate unmitigated impacts through access disruption to fishing and trading (all sites) and water pollution affecting fish catch and income at Farasime and Igbogbele.
- Cultural Heritage: No shrines or burial sites are confirmed within the immediate footprint at any of the three sites; the unmitigated chance of finding subsurface artefacts during excavation represents a Moderate risk axis-wide, addressed through the Chance Finds Procedure.

Gender-Based Violence / SEA / SH Impacts (OS5)

SEA/SH Risk: The presence of temporary labour creates a Major unmitigated risk of sexual exploitation and abuse (SEA) of community members and sexual harassment (SH) of workers. Per the axis's own Table 9.4 risk-factor assessment, the risk is Medium-High at APA and Farasime, and Medium at Igbogbele, driven by labour influx, poor lighting, economic vulnerability, and – at APA specifically – the added complexity of trans-border labour dynamics and police-response gaps.

- Reporting: The fear of retaliation, shame, and lack of confidential channels presents a Critical unmitigated gap across all three sites, compounded at Igbogbele by border-proximity barriers to reporting.

Table 5.20b shows the Construction Phase Impact Assessment.

Table 5.2B: Unmitigated Environmental and Social Impacts – Construction Phase

Impact Category	Impact Description	Sites	Impact Characteristics	Receptor Sensitivity	Significance
Air Quality (PM10)	Dust generation; Igbogbele SP1 exceeds baseline (168.8 µg/m³)	Igbogbele	Magnitude: Large; Duration: Seasonal; Extent: Local; Likelihood: High	High	□ Major
Air Quality (PM10)	Dust generation within baseline limits	APA, Farasime	Magnitude: Small; Duration: Seasonal; Extent: Site; Likelihood: Medium	High	□ Moderate
Noise & Vibration	Equipment noise compounds non-compliant baseline	APA (Critical), Igbogbele, Farasime	Magnitude: Medium; Duration: 12–18 months; Likelihood: Very High	High	□ Major
Soil Erosion	Sediment runoff to Badagry Creek	APA, Farasime	Medium; Construction; High likelihood	High	□ Major
Water Quality	Sediment, concrete wash water (pH 11–13), fuel spills	APA, Farasime	Large; Intermittent; High likelihood	High	● Critical
Vegetation Loss	Clearing farmland/residential plots	Farasime	Small; Permanent; High likelihood	Medium	□ Moderate
Habitat Disturbance	Wetland/riverine margins	Farasime, Igbogbele	Medium; Permanent; High likelihood	High	□ Major

Biodiversity	Loss of aquatic species & ecosystem services	All sites	Medium; Operational; High likelihood	High	□ Major
Aquatic Ecology	Sediment runoff affecting Tilapia, Chrysichthys	APA, Farasime	Medium; Construction; High likelihood	High	□ Major
Aquatic Ecology	Concrete wash water affecting Ethmalosa, Mugil	APA, Farasime	Large; Intermittent; High likelihood	High	● Critical
Aquatic Ecology	Fuel/oil spills affecting crabs & periwinkles	APA, Farasime	Large; Intermittent; Medium likelihood	High	● Critical
Aquatic Ecology	Turbidity increase	All sites	Medium; Construction; High likelihood	High	□ Major
Aquatic Ecology	Mangrove disturbance	APA, Farasime	Small; Permanent; High likelihood	Medium	□ Moderate
Ecosystem Services – Fisheries	Reduced fish catch (>60% income)	All sites	Large; Operational; High likelihood	High	● Critical
Ecosystem Services – Flood Regulation	Loss of wetland buffering	Igbogbele, Farasime	Medium; Permanent; High likelihood	High	□ Major
Ecosystem Services – Water Supply	Groundwater contamination	All sites	Medium; Operational; Medium likelihood	High	□ Major

Ecosystem Services – Transport	Creek access disruption	Farasime	Small; Construction; Medium likelihood	Medium	□ Moderate
Ecosystem Services – Erosion Control	Riparian vegetation loss	All sites	Small; Permanent; Medium likelihood	Medium	□ Moderate
OHS – Working at Height	Asbestos roofing removal	Igbogbele	Large; Intermittent; High likelihood	High	● Critical
OHS – Working at Height	Scaffolding collapse	All sites	Large; Medium likelihood	High	□ Major
OHS – Confined Spaces	Septic tank entry	All sites	Medium; Medium likelihood	High	□ Major
OHS – Confined Spaces	Underground storage entry	All sites	Medium; Medium likelihood	High	□ Major
OHS – Electrical Safety	Retrofitting works	All sites	Medium; Medium likelihood	High	□ Major
OHS – Electrical Safety	Solar panel installation	All sites	Small; Medium likelihood	High	□ Moderate
OHS – Chemical Safety	Asbestos fibre release	Igbogbele	Large; Long-term; High likelihood	High	● Critical

OHS – Chemical Safety	Fuel/oil spills	Farasime	Large; Medium likelihood	High	● Critical
OHS – Chemical Safety	Damp-proof chemicals	Igbogbele	Small; Medium likelihood	Medium	Moderate
OHS – Machinery	Equipment operation	All sites	Medium; Medium likelihood	High	Major
OHS – Machinery	Traffic movements	APA	Medium; High likelihood	High	Major
Heat Stress	Outdoor works	All sites	Medium; Seasonal; High likelihood	High	Major
Community Health & Safety	Traffic, noise, dust, access restriction	All sites	Medium; High likelihood	High	Major
Labour Influx	Pressure on services; trans-border mobility	APA, All sites	Medium; High likelihood	High	Major
Livelihoods	Fishing/trading access disruption	All sites	Medium; High likelihood	High	Moderate
Cultural Heritage	Chance finds	All sites	Small; Low likelihood	Medium	Moderate
GBV/SEA/SH	Worker-community SEA	APA, All sites	Large; High likelihood	High	● Critical
GBV/SEA/SH	Worker-worker SH	All sites	Medium; Medium likelihood	High	Major
GBV/SEA/SH	Child sexual abuse	All sites	Large; Low likelihood	High	● Critical

GBV/SEA/SH	Vulnerable groups	All sites	Medium; High likelihood	High	□ Major
GBV/SEA/SH	Reporting barriers	All sites	Large; Very High likelihood	High	● Critical
GBV/SEA/SH	Economic exploitation	Farasime, APA	Medium; High likelihood	High	□ Major
GBV/SEA/SH	Cultural norms	All sites	Medium; Medium likelihood	High	□ Major
GBV/SEA/SH	Police response failures	All sites	Medium; High likelihood	High	□ Major
GBV/SEA/SH	Flood displacement	APA, Igbogbele	Medium; High likelihood	High	□ Major
GBV/SEA/SH	GRM failure → re-traumatisation	All sites	Large; Medium likelihood	High	● Critical

5.3.2.1 Quantified Environmental Impacts against WB EHS/WHO Compliance Limits

The following tables provide quantified, site-specific impact predictions for key environmental parameters during the construction phase, benchmarked against WB EHS/WHO compliance limits. Baseline values are from Chapter 4 (Section 4.5).

A. Air Quality (PM_{10} and $PM_{2.5}$) — Predicted Construction-Phase Concentrations vs. Compliance Limits

Site	Baseline PM_{10} (µg/m³)	Predicted Peak PM_{10} (µg/m³)	Baseline $PM_{2.5}$ (µg/m³)	Predicted Peak $PM_{2.5}$ (µg/m³)	WB EHS/WHO Limit PM_{10} (µg/m³)	WB EHS/WHO Limit $PM_{2.5}$ (µg/m³)	Exceedance Risk	Significance
APA PHC	2.2	25–40	4.9	15–25	50	25	Low	□ Moderate

Igbogbele PHC	168.8 (SP1)	200–250	116.7 (SP1)	150–180	50	25	Very High	● Critical
Farasime PHC	12.3	30–50	5.8	20–30	50	25	Medium	□ Major

Quantification Basis:

Dust emission factors from earthworks (0.5–2.5 kg/tonne of soil moved), vehicle traffic on unpaved roads (0.5–1.5 kg/VKT), and material handling (0.1–0.5 kg/tonne). Predicted concentrations assume worst-case dry-season conditions, no dust suppression, and average wind speed of 3.6 m/s. Mitigation measures (water spraying 3× daily, covered stockpiles) are expected to reduce PM_{10} by 40–60% and $PM_{2.5}$ by 30–50%.

B. Noise — Predicted Construction-Phase Levels vs. Compliance Limits

Site	Baseline Daytime Leq dB(A)	Predicted Peak Construction Noise dB(A) at 10 m	Predicted Noise at Nearest Receptor dB(A)	WB EHS/WHO Daytime Limit dB(A)	Exceedance	Significance
APA PHC	57.7–63.3	85–95	65–75	55	**Yes (+10–20 dB)**	□ Major
Igbogbele PHC	59.9 (SP2)	85–95	65–75	55	**Yes (+10–20 dB)**	□ Major
Farasime PHC	59.9 (SP3)	80–90	60–70	55	**Yes (+5–15 dB)**	□ Major

Quantification Basis:

Noise levels from construction equipment (excavators 75–85 dB(A), bulldozers 80–90 dB(A), concrete mixers 70–80 dB(A), generators 70–80 dB(A), trucks 70–80 dB(A)) at 10 m distance. Attenuation was calculated using the inverse square law and ISO 9613-2. Predicted levels at nearest residential receptors (10–30 m from site boundary) assume no noise barriers. Mitigation measures (noise barriers, scheduling, silencers) are expected to reduce levels by 10–15 dB(A).

C. Groundwater Quality — Predicted Construction-Phase Impacts vs. Compliance Limits

Parameter	Unit	Baseline Range (All Sites)	Predicted Construction Impact	WHO/FMEnv Limit	Exceedance Risk	Significance
pH	—	5.9–7.5	6.0–7.5	6.5–8.5	Low	□ Minor
Total Coliform	CFU/100ml	53–147	100–300	0	**Very High**	● Critical
E. coli	CFU/100ml	0–3	5–20	0	**High**	□ Major
BOD	mg/L	5.0–9.0	8–15	≤6	**High**	□ Major
COD	mg/L	12.0–16.0	15–25	≤10	**High**	□ Major
TSS	mg/L	—	30–60	≤30	**High**	□ Major

D. Surface Water Quality (Badagry Creek) — Predicted Construction-Phase Impacts vs. Compliance Limits

Parameter	Unit	Baseline (Literature)	Predicted Construction Impact	WHO/FMEnv Limit	Exceedance Risk	Significance
TSS	mg/L	Elevated	50–120	≤30	**Very High**	● Critical
Turbidity	NTU	High during rains	25–60	≤5	**Very High**	● Critical
BOD	mg/L	4.2–12.5	12–25	≤6	**High**	□ Major
COD	mg/L	10–40	25–50	≤20	**High**	□ Major
Total Coliform	CFU/100ml	1.2×10^4–3.5×10^5	10^4–10^6	0	**Very High**	● Critical
E. coli	CFU/100ml	Frequently detected	10^3–10^5	0	**Very High**	● Critical

Lead (Pb)	mg/L	0.02–0.15	0.05–0.20	≤0.01	**High**	□ Major
Iron (Fe)	mg/L	0.3–1.2	0.8–2.5	≤0.3	**High**	□ Major

E. Soil Quality — Predicted Construction-Phase Impacts vs. Compliance Limits

Parameter	Unit	Baseline Range (All Sites)	Predicted Construction Impact	FMEnv/ WHO Limit	Exceedance Risk	Significance
pH	—	5.6–7.6	5.5–7.5	6.0–8.5	Low	□ Minor
Total Petroleum Hydrocarbon (TPH)	mg/kg	<0.01	10–50	≤50	Medium	□ Moderate
Lead (Pb)	mg/kg	<0.01	0.5–2.0	≤85	Low	□ Minor
Copper (Cu)	mg/kg	1.4–3.1	5–15	≤100	Low	□ Minor
Zinc (Zn)	mg/kg	<0.01	5–20	≤300	Low	□ Minor
Coliforms	CFU/ g	<23–<27	100–500	0	**High**	□ Major
Total Plate Count	CFU/ g	1,220– TNTC	2,000–TNTC	≤1000	**High**	□ Major

F. Summary of Quantified Impacts by Site

Site	Critical Impacts	Major Impacts	Moderate Impacts	Minor Impacts
APA PHC	Surface water TSS/turbidity/coliforms/E. coli	Noise, groundwater coliforms/E. coli, soil coliforms, BOD/COD	PM_{10}, $PM_{2.5}$, TPH	pH, heavy metals
Igbogbele PHC	PM_{10}, $PM_{2.5}$ (SP1), surface water	Noise, groundwater coliforms/E. coli,	TPH	pH, heavy metals

	TSS/turbidity/coliforms/E. coli	soil coliforms, BOD/COD		
Farasime PHC	Surface water TSS/turbidity/coliforms/E. coli	PM_{10}, $PM_{2.5}$, noise, groundwater coliforms/E. coli, soil coliforms, BOD/COD	TPH	pH, heavy metals

Quantitative physical changes caused by project activities:

- **Air Quality (Dust & Emissions):** During construction earthworks and excavation at APA, particulate matter concentrations (PM_{10}) are projected to increase by 45 to 85 µg/m³ above baseline, and fine particulates ($PM_{2.5}$) by 20 to 40 µg/m³ resulting in localized exceedances of the 50 µg/m³ (PM_{10}) and 25 µg/m³ ($PM_{2.5}$) limits prior to water suppression mitigation.
- **Noise Generation:** Operation of heavy machinery (excavators, concrete mixers, generators) during construction is projected to elevate ambient noise levels at facility boundaries by 15 to 28 dB(A) above baseline, yielding unmitigated noise levels of 68 to 78 dB(A) (exceeding the 55 dB(A) daytime residential guideline).
- **Health and Safety (Occupational Risk):** Without adherence to Occupational Health and Safety (OHS) plans and PPE enforcement, construction operations across the 3 sites present an estimated exposure risk of 2 to 4 Lost Time Injuries (LTIs) per 100,000 worker-hours due to slips, trips, manual handling, and minor structural/electrical hazards during retrofitting and elevated platform construction.

5.3.3 Operation Phase Impacts

The operational lifespan (50+ years) generates long-term impacts related to clinical activities and climate change.

- Medical Waste (OS4): Operational unmitigated generation of infectious waste and sharps represents a Major risk if collection is relied upon without a proper HMWMP and colour-coded segregation – particularly acute for this axis given the requirement that no waste stream discharge to Badagry Creek. Infection control failure poses a concomitant Major HAI risk.
- Water Quality (OS4): Septic and wastewater systems present a Moderate unmitigated risk of soil and groundwater contamination, compounded by the saltwater-intrusion and high-water-table

conditions confirmed at Igbogbele, which also affect structural durability (rising damp) and require chemical damp-proof-course remediation.

- Stormwater accumulation around the facility due to poor drainage. Flooding of access roads, affecting patient movement and emergency response. Mosquito breeding in stagnant water, increasing malaria risk. Backflow risk into facility drainage during high tides. Potential contamination pathways if wastewater systems are not properly sealed.
- Energy Use (OS4): Unmitigated reliance on diesel generators for backup power would result in estimated GHG emissions contributing to the programme-wide 2,000-4,000 tCO2e/year range. This is a Minor impact, significantly reduced by the planned solar PV systems (24-48 hour battery backup) at all three facilities.
- Climate Vulnerability (OS6): Unmitigated, the facilities face Major risks from climate change. By 2050 (RCP 8.5), Farasime is explicitly flagged as a flood high-risk site and APA (Badagry West) as a coastal-erosion/sea-level-rise high-risk site in the axis's own Climate Hazard Mapping (Table 1.10), with sea-level rise of 0.2-0.5 m and increased storm surge. Extreme heatwaves (>40 C days rising from ~10 to ~60/year) pose Moderate to Major health and operational risks axis-wide, with APA's built-up corridor setting an elevated exposure point. Igbogbele's flood-prone, high-water-table condition presents an ongoing Moderate to Major risk of inundation and structural moisture ingress. Table 5.2C shows the **Operation Phase Impact Assessment.**

Table 5.2C: Unmitigated Environmental and Social Impacts – Operation Phase

Impact Category	Description	Sites	Characteristics	Sensitivity	Significance
Medical Waste	Infectious waste without HMWMP	All sites	Large; Very High likelihood	High	□ Major
HAI	Infection control failure	All sites	Large; Medium likelihood	High	□ Major
Wastewater	Septic contamination; saltwater intrusion	Igbogbele, All sites	Medium; Medium likelihood	High	□ Moderate
Energy Use	Diesel generator emissions	All sites	Small; High likelihood	Medium	□ Minor
Climate – Flooding	High flood risk	Farasime, Igbogbele	Large; High likelihood	High	● Critical

Climate – Coastal Erosion/SLR	Sea-level rise, storm surge	APA	Large; High likelihood	High	● Critical
Climate – Heatwaves	>40°C days increase	All sites	Medium; High likelihood	High	□ Major
Climate – Moisture Ingress	Rising damp	Igbogbele	Medium; High likelihood	High	□ Major

5.3.4 Decommissioning Phase Impacts

Table 5.2d summarises the unmitigated environmental and social impacts anticipated during the Decommissioning Phase of the project. These impacts primarily relate to hazardous material handling, demolition waste generation, soil and groundwater disturbance, temporary community access restrictions, and livelihood transitions. Each impact has been evaluated using the established multi-criteria significance methodology, incorporating magnitude, duration, extent, likelihood, and receptor sensitivity to determine the appropriate significance rating and the level of mitigation required.

Table 5.2D: Unmitigated Environmental and Social Impacts – Decommissioning Phase

Impact Category	Description	Sites	Characteristics	Sensitivity	Significance
Hazardous Materials	Asbestos removal	All sites	Large; Medium likelihood	High	□ Major
Demolition Debris	Waste generation	All sites	Medium; High likelihood	Medium	□ Moderate
Soil Disturbance	Erosion	All sites	Medium; High likelihood	Medium	□ Moderate
Groundwater	Septic tank decommissioning	All sites	Medium; Medium likelihood	High	□ Major
Creek Margin Disturbance	Restoration works	APA, Farasime	Medium; Medium likelihood	High	□ Major
Community Disruption	Access restrictions	All sites	Small; Medium likelihood	Medium	□ Moderate

Livelihood Transition	Loss of employment	All sites	Medium; Medium likelihood	High	□ Major

Beneficial Impacts

The subsequent table presents the long-term beneficial impacts expected across all PHC sites as a result of the project's implementation. These positive outcomes include expanded healthcare access for approximately 150,000 residents, significant reductions in maternal and child mortality, substantial employment generation, measurable greenhouse gas reductions through solar PV adoption, and strengthened climate and pandemic resilience for riverine and coastal communities. These impacts reflect the enduring social and environmental benefits of the LSHIP intervention and highlight its contribution to improved wellbeing and regional development.

Table 5.3: Beneficial Impacts

Impact Category	Description	Sites	Characteristics	Sensitivity	Significance
Healthcare Access	150,000 residents served	All sites	Large; Very High likelihood	High	● Significant Positive
Maternal Health	20–30% reduction in maternal mortality	All sites	Large; High likelihood	High	● Significant Positive
Child Health	25–35% reduction in under-five mortality	All sites	Large; High likelihood	High	● Significant Positive
Employment	85–105 direct jobs; 5,000–8,000 indirect	All sites	Large; High likelihood	High	● Significant Positive
GHG Reduction	800–1,500 tCO_2e/year reduction	All sites	Large; High likelihood	Medium	● Moderate Positive
Climate Resilience	Strengthened pandemic resilience	All sites	Large; High likelihood	High	● Significant Positive

5.4 Site-Specific Impact Significance Matrix (Unmitigated Scenario)

The detailed impact assessment presented in Section 5.3 identifies a wide spectrum of unmitigated environmental, social, and health and safety risks across the three PHC sites in the Badagry Axis. Because

each site has distinct baseline sensitivities – ranging from confirmed asbestos (Igbogbele), Badagry Creek water quality and waterfront exposure (Farasime), to trans-border labour dynamics and traffic (APA) – it is essential to evaluate impacts site by site.

Colour codes: ● Critical □ Major □ Moderate □ Minor ◍ Positive

5.4.1 APA – Site-Specific Impact Matrix

(New construction; inland border-corridor anchor; trans-border labour mobility; flood/erosion exposure)

Category	Impact	Significance	Colour
Biophysical	Flooding / coastal erosion exposure	Major	□
Biophysical	Noise (baseline non-compliant, all 3 SPs)	Major	□
Biophysical	Asbestos disturbance (aged structures, pending survey)	Major	□
Social	Labour influx & trans-border mobility	Major	□
Social	GBV/SEA/SH risk	Major	□
Social	Reporting barriers (police response, cultural norms)	Critical	●
Health & Safety	Community safety (Owode-Apa corridor traffic)	Major	□
Health & Safety	Worker OHS risks	Major	□

5.4.2 IGBOGBELE – Site-Specific Impact Matrix

(Refurbishment; confirmed ACM; flood-prone, high-water-table zone; border-proximity reporting barriers)

Category	Impact	Significance	Colour
Biophysical	Asbestos disturbance (confirmed ACM)	Critical	●
Biophysical	Air quality (localized SP1 exceedance)	Major	□
Biophysical	Flooding / high water table / saltwater intrusion	Major	□
Social	GBV/SEA/SH risk; border-proximity reporting barriers	Critical	●
Health & Safety	Asbestos OHS exposure	Critical	●
Health & Safety	Community safety	Moderate	□

5.4.3 FARASIME – Site-Specific Impact Matrix

(Refurbishment; Badagry Creek waterfront; tidal inundation; fisheries dependency)

Category	Impact	Significance	Colour
Biophysical	Water quality contamination (Badagry Creek)	Critical	●

Biophysical	Coastal erosion / sea-level rise	Major	□
Biophysical	Asbestos disturbance (aged structures, pending survey)	Major	□
Biophysical	Noise (SP3 baseline exceedance)	Moderate	□
Social	Fisheries livelihood disruption	Major	□
Social	GBV/SEA/SH risk	Major	□
Health & Safety	Fuel spill worst case (waterfront works)	Critical	●
Health & Safety	Worker OHS	Major	□

5.5 Summary of Key Impacts

5.5.1 Overview of Key Adverse Impacts (Unmitigated)

The unmitigated impact assessment identifies that physical disturbance impacts (dust, noise, erosion, water quality) peak during the construction phase, along with significant labour-influx and GBV risks. The pre-construction phase holds the highest unmitigated risk regarding asbestos exposure (confirmed at Igbogbele) and resettlement. The operational phase is dominated by hazardous medical waste management – with the added constraint of zero discharge to Badagry Creek – and increasing climate vulnerability over the 50-year facility lifespan.

Key findings of unmitigated significance for the Badagry Axis are summarised as follows:

- **Critical Impacts (must be avoided or fully mitigated):**
  - Pre-construction: asbestos exposure at Igbogbele (confirmed ACM);
  - Construction: discharge of medical and construction waste into Badagry Creek; GBV/SEA/SH reporting barriers across all sites; fuel-spill worst case at the Farasime waterfront.
- **Major Impacts (must be mitigated):**
  - Construction: labour influx and trans-border mobility pressure (APA); OHS risks (all sites); community health and safety (APA corridor traffic); GBV/SEA/SH risk (all sites); water quality and erosion risks (Farasime, Igbogbele); fisheries and trading livelihood disruption.
  - Operation: unmitigated medical waste and sharps management; climate vulnerability (flooding at Farasime and Igbogbele, coastal erosion/SLR at APA, heatwaves axis-wide).
- **Moderate Impacts (manageable with standard mitigation):**
  - Unmitigated air quality degradation (localized at Igbogbele SP1); unmitigated soil erosion; cumulative traffic and noise effects.

5.5.2 Overview of Key Beneficial Impacts

Despite the significant potential for adverse impacts if unmitigated, the project is expected to deliver substantial, long-term beneficial impacts aligned with AfDB Operational Safeguards (OS1).

- **Significant Positive (High Positive):**
  - Construction: generation of direct jobs and supply-chain jobs across the staggered per-facility workforce, with a local-hiring priority target reducing labour-influx pressure.
  - Operation: healthcare access for approximately 150,000 residents across the axis (~50,000 per facility); maternal mortality estimated to reduce by 20-30% and under-five mortality by 25-35%; strengthened pandemic resilience for remote riverine communities.
- **Moderate Positive (Medium Positive):**
  - Construction: local skills training and capacity building.
  - Operation: transition to solar energy contributing to the programme-wide 2,000-4,000 tCO2e/year GHG reduction; reduction in GBV/SEA/SH risk through the GBV Action Plan and the axis's own 8-step referral pathway.

5.6 Worst-Case Scenarios and Cumulative Risk

The worst-case scenario analysis emphasises unmitigated events with the highest consequence. Uncontrolled asbestos release during roof replacement at Igbogbele poses a critical risk, given the ACM there is confirmed rather than merely suspected, potentially leading to mesothelioma health crises decades later. A significant fuel or waste spill unmitigated near Badagry Creek (at APA or Farasime) is a major to critical risk, threatening the fisheries and cross-border trade livelihoods the creek supports. Uncontrolled flooding at Igbogbele or Farasime without the elevated-platform and drainage design is a likely Major to Critical risk to facility continuity and community safety. Socially, the worst-case scenario is a failure to support a GBV survivor – compounded at APA by trans-border complexities and at Igbogbele by border-proximity reporting barriers – causing severe trauma and potential community protest.

Cumulative impacts along the Badagry corridor include labour influx (compounded by cross-border movement at APA) leading to GBV, housing pressure, and social tension; and cumulative air-quality and traffic degradation along the Badagry-Seme Expressway from other border-corridor development activity. AfDB alignment confirms that the project's assessment has correctly triggered and addressed all relevant Operational Safeguards (OS1-OS10) through full impact assessment, the RAP, Badagry Creek water-quality and biodiversity screening (OS3), pollution prevention and hazardous-materials assessment (OS4,

OS8), labour and GBV assessments (OS5) – including the axis's trans-border labour context – and climate vulnerability analysis (OS6).

5.7 Conclusion of the Impact Assessment

The impact assessment has identified a wide spectrum of unmitigated impacts, from Critical (confirmed asbestos at Igbogbele, Badagry Creek discharge risk, GBV reporting gaps) to Minor. These have been specifically linked to project phases, key sites, and receptors in the Badagry Axis.

Critical impacts – notably confirmed asbestos at Igbogbele and the risk of waste discharge to Badagry Creek – must be avoided or fully mitigated. All Major impacts concerning labour, health, safety, GBV, medical waste, and fisheries livelihoods must be mitigated to acceptable levels. Moderate impacts are manageable with standard mitigation measures. Simultaneously, the project's high positive benefits for healthcare, maternal/child health, employment, and the local economy must be maximised.

With the implementation of the mitigation measures outlined in Chapter 6 and the corresponding management plans – the Environmental and Social Management Plan (ESMP, Chapter 7), the Hazardous and Medical Waste Management Plan (HMWMP, Chapter 8), and the GBV/SEA/SH Action Plan (Chapter 9) – the project's adverse impacts can be effectively minimised to an acceptable level, allowing for the maximisation of its substantial beneficial impacts and the safe realisation of its goals for the APA-Igbogbele-Farasime corridor.

CHAPTER 6 – MITIGATION MEASURES

6.1 Introduction

Chapter 6 presents the mitigation measures required to address the environmental, social, health, and safety impacts identified in Chapter 5 for the three PHC facilities in the Badagry Group 7 Axis. All measures follow the AfDB mitigation hierarchy, Avoid, Minimise, Restore, Offset, and are designed to ensure compliance with FMEnv, NESREA, LASEPA, AfDB ISS, IFC Performance Standards, WHO, and ILO requirements.

The Badagry Axis contains a distinct set of environmental and social sensitivities, including riverine and creek margins along Badagry Creek (all sites), asbestos-suspected roofing and aged hazardous-material-suspect structures (Igbogbele; APA and Farasime pending survey), fisheries- and trade-dependent communities (all sites), , flood-prone terrain (Igbogbele; Farasime), coastal erosion and sea-level-rise exposure (APA), trans-border labour mobility, and GBV/SEA/SH hotspots at all three facilities. Because these sensitivities vary across sites, mitigation measures are site-specific, ensuring that risks are managed precisely where they occur and at the appropriate scale.

These measures form the operational backbone of the Environmental and Social Management Plan (ESMP) in Chapter 7 and will guide contractors, the PIU, and facility operators throughout the pre-construction, construction, and operation phases.

The impact assessment for the Group 7 facilities must be interpreted within the context of the facility typology. The APA, Igbogbele, and Farasime Primary Healthcare Centres are small rural PHCs with modest service footprints, limited infrastructure, and low-intensity clinical operations. Unlike general hospitals, these facilities do not generate complex waste streams, hazardous effluents, high-volume wastewater, or significant ecological pressures. As such, the scale and significance of potential environmental and social impacts are inherently limited

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 APA, Igbogbele, and Farasime PHCs 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.

APA PHC, currently undergoing new construction, 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. Igbogbele and Farasime PHCs, both 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.

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.

APA PHC (Construction Phase Only)

Category	**APA 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

Igbogbele & Farasime PHCs (Renovation Phase)

Category	Igbogbele PHC	Farasime 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	APA PHC	Igbogbele PHC	Farasime PHC	Impact Rating	Monitoring Indicators	Mitigation Measures
Baseline – Disease Burden	Very high malaria; high typhoid; high RTIs; moderate hypertension & diabetes	Same	Same	● High	Weekly disease surveillance; drug stock levels	Strengthen surveillance; ensure drug availability; 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	Same	Same	● High	Water availability logs;	Maintain water systems; ensure

	supply required; sanitation systems must be functional				WASH functionality checks	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	Strengthen IPC; ensure WASH	Same	Same	—	Compliance audits; facility supervision	Same measures apply across all three PHCs

Requirements	reliability; routine maintenance; waste segregation; staff training; emergency preparedness					

6.3 Site-Specific Mitigation Measures

Mitigation measures are organised by PHC site and aligned with the biophysical, social, and health & safety stakes identified in Chapter 5. Each site-specific matrix provides targeted actions that directly respond to the unmitigated impacts identified during the assessment, ensuring that interventions are practical, proportionate, and tailored to local sensitivities.

The mitigation measures presented in this chapter apply the AfDB mitigation hierarchy – Avoid, Minimise, Restore, Offset – to ensure that project risks are systematically reduced to acceptable levels. The chapter integrates the requirements of the AfDB Integrated Safeguards System (ISS), FMEnv/NESREA regulations, LASEPA standards, IFC Performance Standards, and WHO/ILO guidelines.

Because each PHC site interacts with different environmental and social receptors – Badagry Creek, aged/hazardous-material-suspect structures, PAP livelihoods, flood-prone and erosion-prone terrain, GBV hotspots, cultural heritage features, and the Owode-Apa traffic corridor – the mitigation measures are presented in site-specific matrices covering:

- Biophysical mitigation: air quality, noise, soil erosion, coastal/creek water quality, biodiversity, hazardous materials
- Social mitigation: livelihoods, labour influx, GBV/SEA/SH, cultural heritage
- Health & safety mitigation: OHS, community safety, asbestos handling, traffic management, heat stress and flood exposure

Together, these measures provide a clear and actionable framework for managing risks across all project phases and form the foundation of the ESMP in Chapter 7.

6.3.1 APA – Site-Specific Mitigation Measures

Biophysical Mitigation Measures

- Flood and Coastal-Erosion Avoidance (Avoid): Elevated-platform foundation designed above the 1:100-year flood level with an additional 30% climate-change factor, supported by oversized perimeter drainage sized for extreme rainfall events.
- Creek Water-Quality Protection (Minimise): No discharge of construction wash-water, cement slurry, or waste into Badagry Creek. Use sediment traps, silt fences, and bunded fuel storage to prevent hydrocarbon leaks.
- Groundwater & Structural Stability (Avoid/Minimise): Reinforced foundations designed to counter groundwater uplift; major earthworks scheduled for the dry season.
- Erosion Control (Minimise): Maintain a vegetated buffer zone along the creek; avoid direct stormwater discharge to the creek bank.
- Asbestos Risk Management (Avoid): Conduct a licensed asbestos survey for aged ancillary structures. If confirmed, implement regulated abatement, air monitoring, and controlled disposal.
- Dust & Noise Control (Minimise): Water-spray dust suppression; noise-intensive activities scheduled to comply with daytime limits along the corridor.

Social Mitigation Measures

- Livelihood Continuity (Restore): Support uninterrupted fishing and trading activities during construction through access management and stakeholder coordination.
- Labour Influx & Trans-Border Mobility Management (Minimise): Implement a Labour Influx Management Plan: worker camp rules, Code of Conduct, prohibition of child labour, and prioritised local hiring.
- GBV/SEA/SH Prevention (Avoid/Minimise): Enforce Code of Conduct; mandatory training; confidential survivor-centred reporting; functional referral pathways established before construction.

Health & Safety Mitigation Measures

- Traffic Safety (Minimise): Implement a Traffic Management Plan for the Owode–Apa corridor: marshals, speed limits, signage, and safe diversion routes.

- Asbestos OHS Controls (Avoid): Pending survey results, restrict access, provide PPE, and enforce safe-work protocols.
- Heat-Stress & Flood-Contingency Management (Minimise): Provide shade, hydration points, rest cycles; emergency response plan for flood events affecting construction or access.

Residual Impact Rating

With mitigation in place:

Impact	Unmitigated	Residual
Flooding risk	Moderate	Low
Drainage interference	Moderate	Low
Erosion risk	Moderate	Low
Water-quality impact	Low	Very Low
Public-health risk (mosquito breeding)	Moderate	Low

The PHC remains hydrologically viable with proper ESMP implementation.

APA – Mitigation Table

Impact Category	**Unmitigated Impact**	**Mitigation Measure**	**Hierarchy**	**Responsible**
Biophysical	Coastal erosion / flooding	Elevated platform; oversized drainage	Avoid	PIU / Design Contractor
Biophysical	Creek water contamination	Sediment traps; bunded fuel storage; no wash-water discharge	Minimise	Contractor
Biophysical	Asbestos exposure	Licensed survey; abatement; air monitoring	Avoid	Specialist
Social	Fisheries/trading disruption	Livelihood continuity support	Restore	PIU
Social	Labour influx & mobility	Worker camp rules; CoC; local hiring	Minimise	Contractor
Social	GBV/SEA/SH risk	Survivor-centred response; confidential GRM; referral MOUs	Avoid/Minimise	PIU / GBV Specialist

Health & Safety	Traffic risk	Marshals; speed limits; signage	Minimise	Contractor
Health & Safety	Worker OHS / heat stress	PPE; shade; hydration; rest cycles	Minimise	Contractor

6.3.2 IGBOGBELE – Site-Specific Mitigation Measures

Biophysical

- Full asbestos survey and abatement by a licensed contractor (wet removal, HEPA vacuums, air monitoring) given the roofing already flagged as asbestos-suspected (Avoid).
- Flood-resilient design: oversized drainage, elevated floor slabs and electrical panels (Avoid/Minimise).
- Riverine/wetland-fringe buffer maintenance; erosion and sediment control on the sandy soils (Minimise).
- Targeted dust suppression at the localized SP1 source (water spraying, covering stockpiles) and noise controls at SP2 (barriers, scheduling of noisy works) (Minimise).

Social

- GBV/SEA/SH Action Plan with confidential, anonymous-option reporting channels designed to overcome the border-proximity reporting barriers identified during consultation (Avoid/Minimise).
- Continuity of clinical services during refurbishment (phased works, temporary service arrangements) (Minimise).

Health & Safety

- Asbestos PPE (P3 respirators, Type 5 coveralls); restricted access during abatement; air monitoring (<=0.1 f/ml threshold, <=0.01 f/ml clearance).
- Community safety during flood events; worker OHS training.

IGBOGBELE – Mitigation Matrix

Impact Category	Unmitigated Impact	Mitigation Measure	Hierarchy	Responsible
Biophysical	Asbestos exposure (suspected roofing)	Licensed abatement; wet removal; HEPA vacuums; air monitoring	Avoid	Specialist

Biophysical	Flooding / drainage congestion	Oversized drainage; elevated slabs and electricals	Avoid/Minimise	PIU / Design Contractor
Biophysical	Localized dust exceedance (SP1)	Water spraying; covered stockpiles; source control	Minimise	Contractor
Biophysical	Localized noise exceedance (SP2)	Noise barriers; scheduling of noisy works	Minimise	Contractor
Social	GBV/SEA/SH; reporting barriers (border proximity)	Confidential, anonymous-option GRM; survivor-centred response	Avoid/Minimise	PIU / GBV Specialist
Health & Safety	Asbestos OHS	P3 respirators; Type 5 coveralls; restricted access	Avoid	Specialist
Health & Safety	Continuity of clinical services	Phased works; temporary service arrangements	Minimise	Contractor / Facility Operator

6.3.3 FARASIME – Site-Specific Mitigation Measures

Biophysical

- Asbestos survey of aged structures; licensed abatement if confirmed (Avoid).
- Shoreline and creek-margin protection: sediment traps, no discharge of any waste stream to Badagry Creek, bunded storage (Minimise).
- Noise management at the localized SP3 exceedance (barriers, scheduling) (Minimise).
- Flood-resilient design consistent with the axis standard (oversized drainage, elevated electricals) (Avoid/Minimise).

Social

- Fisheries livelihood support – temporary compensation and alternative-income training during construction (Restore).

- GBV/SEA/SH Action Plan: Code of Conduct, training, confidential reporting, referral pathways (Avoid/Minimise).

Health & Safety

- Asbestos OHS controls pending survey confirmation (PPE, restricted access, air monitoring).
- Worker OHS training for waterfront operations; heat-stress and flood-contingency management.

FARASIME – Mitigation Matrix

Impact Category	Unmitigated Impact	Mitigation Measure	Hierarchy	Responsible
Biophysical	Asbestos exposure (aged structures, pending survey)	Licensed survey; abatement if confirmed; air monitoring	Avoid	Specialist
Biophysical	Badagry Creek water contamination (shoreline/waterfront works)	Sediment traps; bunded storage; no discharge	Minimise	Contractor
Biophysical	Localized noise exceedance (SP3)	Noise barriers; scheduling of noisy works	Minimise	Contractor
Social	GBV/SEA/SH risk	Survivor-centred response; confidential GRM	Avoid/Minimise	PIU / GBV Specialist
Health & Safety	Fuel spill / waterfront operations risk	Emergency spill response plan; bunded storage	Minimise	Contractor
Health & Safety	Worker OHS / heat stress	PPE; shade, hydration, rest cycles	Minimise	Contractor

CHAPTER 7 – ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1 General Introduction

The Environmental and Social Management Plan (ESMP) provides the operational framework for implementing the mitigation measures identified in Chapter 6 for the three PHC facilities in the Badagry Group 7 Axis: APA, Igbogbele, and Farasime. It translates the site-specific risks into clear actions, responsibilities, monitoring requirements, and performance indicators across all project phases – pre-construction, construction, and operation.

The ESMP ensures compliance with the AfDB Integrated Safeguards System (ISS), FMEnv EIA Act, NESREA regulations, LASEPA environmental standards, IFC Performance Standards, WHO healthcare waste and IPC guidelines, and ILO labour and OHS conventions. It establishes a structured mechanism for managing environmental and social risks at each site, ensuring contractors and facility operators implement mitigation measures, monitoring performance through measurable indicators, protecting community health, safety, and security, and ensuring transparency, accountability, and continuous improvement.

Because each PHC site has distinct sensitivities – new construction on a flood/erosion-exposed coastal parcel with trans-border labour mobility (APA), asbestos-suspected roofing in a high-moisture flood-prone zone (Igbogbele), and waterfront/creek-margin refurbishment with fisheries dependency (Farasime) – the ESMP is site-specific, ensuring that risks are managed precisely where they occur.

7.2 Site-Specific ESMPs for the Three PHC Sites

This section presents site-specific ESMPs, each structured into:

A. Biophysical Management;

B. Social Management;

C. Health & Safety Management;

D. Monitoring Indicators;

E. Responsibilities.



Figure 7.1: Site-Specific ESMP (Environmental & Social Management Plan) Framework

7.2.1 APA – Site-Specific ESMP

A. Biophysical Management

Impact	ESMP Action	Performance Indicator
Flooding / coastal erosion	Elevated-platform design; oversized drainage (1:100-yr + 30%)	Zero flood-related damage to works
Creek contamination	Sediment traps; bunded fuel storage; no wash-water discharge	TSS <=30 mg/L; no hydrocarbons in creek
Asbestos (aged ancillary structures)	Licensed survey; abatement if confirmed; air monitoring	<=0.1 f/ml

Drainage plan

The drainage plan for the proposed PHC near Badagry Creek is designed to ensure rapid removal of stormwater, prevent flooding and backflow, minimize erosion and sediment transport to the creek, and reduce public health risks associated with stagnant water. With proper construction and ongoing maintenance, the drainage system will support resilient, continuous health service delivery in a hydrologically sensitive coastal environment.

1. Design principles

- Elevated platform: Raise the PHC floor level above the recorded/expected flood level (including climate-adjusted projections).
- Positive drainage: Ensure all surfaces slope away from buildings toward designated drains and soakaways.
- Separation of systems: Keep stormwater drainage separate from wastewater/septic systems to avoid cross-contamination and backflow.

2. Stormwater management

- Perimeter drains: Install concrete or lined drains around the PHC to collect runoff from roofs, pavements, and access roads.
- Soakaways / infiltration pits: Use soakaways where soil conditions permit to reduce direct discharge to the creek and attenuate peak flows.
- Backflow prevention: Fit non-return valves on outlets that could be influenced by creek water levels or tidal backflow.
- Outfall design: Where discharge to natural channels is unavoidable, use energy-dissipating structures and avoid direct discharge onto the creek bank.

3. Flood and erosion control

- Site grading: Shape the site to avoid low-lying pockets where water can pond; connect all low points to drains.
- Creek buffer zone: Maintain a vegetated buffer strip between the PHC and the creek to reduce erosion and filter runoff.
- Erosion protection: Use bio-engineering (grasses, shrubs, mangroves where appropriate) or geotextiles on vulnerable slopes**.**

4. Operation and maintenance

- Routine drain cleaning: Establish a schedule for clearing silt, debris, and vegetation from drains before and during rainy seasons.
- Inspection after major storms: Inspect outfalls, banks, and internal drainage after heavy rainfall or flooding events; repair promptly.
- Mosquito control: Integrate vector control into facility operations—eliminate standing water, treat high-risk areas, and coordinate with public health programmes.

B. Social Management

Impact	ESMP Action	Performance Indicator
Fisheries/trading livelihoods	RAP compensation; livelihood continuity support	PAP satisfaction ≥80%
Labour influx / trans-border mobility	Worker camp rules; CoC; local-hiring priority	Zero conflicts
GBV/SEA/SH	Confidential GRM; survivor-centred response	100% workers trained

C. Health & Safety Management

Impact	ESMP Action	Performance Indicator
Traffic risks (Owode–Apa corridor)	Deploy trained marshals; enforce speed limits; establish diversion routes; install warning signage	Zero traffic incidents
Asbestos OHS (pending survey)	Use P3 respirators; restrict access; wet-method handling; controlled removal by licensed contractor	100% PPE compliance
Working at height	Use fall-arrest systems; scaffolding inspections; edge protection; permit-to-work system	Zero fall incidents; 100% permit compliance
Confined space entry	Gas testing; ventilation; standby attendant; confined-space entry permit; rescue plan	Zero confined-space incidents
Electrical safety	Lock-out/tag-out (LOTO); insulated tools; elevated electrical installations; routine inspections	Zero electrical shocks
Chemical safety (fuels, reagents, solvents)	Bunded storage; SDS availability; spill kits; chemical handling training; emergency showers	Zero major spills; 100% SDS availability
Lone working	Lone-worker protocol; communication devices; check-in/check-out system	100% compliance with lone-worker procedure

Hazardous materials & hazardous waste	Segregation; labeled containers; licensed disposal; secure storage; no community exposure	Zero uncontrolled releases; 100% compliant manifests
Community health & safety (CHS)	Secure work zones; fencing; signage; controlled access; community awareness; safe routing of trucks	Zero community incidents; no public exposure to hazards
Impact	**ESMP Action**	**Performance Indicator**
Traffic (Owode-Apa corridor)	Marshals; speed limits; diversion routes	Zero incidents
Asbestos OHS (pending survey)	P3 respirators; restricted access	100% PPE compliance

D. Monitoring Indicators: creek water quality monthly; noise weekly (addressing the non-compliant daytime readings recorded at all three APA sampling points); traffic incidents monthly; local-hiring rate monthly; GRM resolution <=14 days.

E. Responsibilities: Contractor – sediment/spill control, traffic management, labour-influx controls; PIU – RAP delivery, fisheries livelihood support, GBV oversight; IESM – quarterly audits.

7.2.2 IGBOGBELE – Site-Specific ESMP

Key sensitivities: Asbestos-suspected roofing, flood-prone zone, localized PM10/PM2.5 exceedance (SP1), localized noise exceedance (SP2), riverine/wetland fringe, GBV with border-proximity reporting barriers.

A. Biophysical Management

mpact	ESMP Action	Performance Indicator
Asbestos (suspected roofing)	Licensed asbestos abatement; wet-method removal; HEPA vacuums; continuous air monitoring	≤ 0.1 f/ml
Flooding / drainage congestion	Oversized drainage channels; elevated slabs and electrical installations	Zero flood-related service interruption
Localized dust exceedance (SP1)	Water spraying; covered stockpiles; strict source control	$PM_{10} \leq 50$ µg/m³

Localized noise exceedance (SP2)	Noise barriers; scheduling of noisy works; equipment maintenance	≤ 55 dB(A)
Solid waste generation (construction & operations)	Segregation at source; covered skips; daily evacuation; disposal at LAWMA-approved facility	100% compliant disposal manifests
Sludge waste (from cleaning, maintenance, wastewater systems)	Dewatering; safe containment; disposal through licensed waste contractors	Zero uncontrolled sludge discharge
Wastewater discharge (greywater, wash-down water)	Temporary holding tanks; filtration; discharge only to approved drains; no release to creek	TSS ≤ 30 mg/L; zero untreated discharge
Chemical spills (fuels, solvents, reagents)	Bunded storage; spill kits; trained spill response team; immediate containment	Zero major spills; response ≤ 30 minutes
Aqua ecology & ecosystem services (Badagry Creek)	Silt curtains; sediment traps; no in-water works during sensitive periods; prohibit discharge; maintain riparian vegetation; protect fisheries access	No measurable decline in water quality; no disruption to fisheries livelihoods
Impact	**ESMP Action**	**Performance Indicator**
Asbestos (suspected roofing)	Licensed abatement; wet removal; HEPA vacuums; air monitoring	<=0.1 f/ml
cle?Flooding / drainage congestion	Oversized drainage; elevated slabs and electricals	Zero flood-related service interruption
Localized dust exceedance (SP1)	Water spraying; covered stockpiles; source control	PM10 <=50 ug/m3
Localized noise exceedance (SP2)	Noise barriers; scheduling of noisy works	<=55 dB(A)

B. Social Management

Impact	**ESMP Action**	**Performance Indicator**

GBV/SEA/SH; border-proximity reporting barriers	Confidential, anonymous-option GRM	100% workers trained

C. Health & Safety Management

Impact	ESMP Action	Performance Indicator
Asbestos OHS	P3 respirators; Type 5 coveralls; restricted access	100% PPE compliance
Continuity of clinical services	Phased works; temporary service arrangements	Zero service interruption days unmanaged

D. Monitoring Indicators: asbestos air monitoring continuous; PM10/PM2.5 at SP1 daily during works; noise at SP2 weekly; GRM resolution <=14 days.

E. Responsibilities: Specialist contractor – asbestos abatement; Contractor – dust/noise control, phased works coordination; PIU – livelihood restoration; IESM – compliance verification.

7.2.3 FARASIME – Site-Specific ESMP

Key sensitivities: Badagry Creek waterfront, aged infrastructure with asbestos risk pending survey, fisheries livelihoods, localized noise exceedance (SP3), GBV/SEA/SH.

A. Biophysical Management

Impact	ESMP Action	Performance Indicator
Asbestos (aged structures, pending survey)	Licensed survey; abatement if confirmed; air monitoring	<=0.1 f/ml
Badagry Creek contamination	Sediment traps; bunded storage; no discharge	TSS <=30 mg/L; zero spills
Localized noise exceedance (SP3)	Noise barriers; scheduling	<=55 dB(A)

B. Social Management

Impact	ESMP Action	Performance Indicator
GBV/SEA/SH	Confidential GRM; survivor-centred response	100% workers trained

C. Health & Safety Management

Impact	ESMP Action	Performance Indicator

Fuel spill / waterfront OHS	Emergency spill response plan; bunded storage; life jackets where applicable	Response <=30 minutes; zero spills
General OHS risks across project life (electricals, lone working, confined space, working at height, permits, etc.)	Implement and enforce a comprehensive OHS Management Plan covering: electrical safety; lock-out/tag-out; lone-working protocols; confined-space entry; working-at-height controls; permit-to-work system; toolbox talks; supervision; incident reporting	Zero lost-time incidents (LTI); 100% permit compliance; Daily toolbox talks conducted
Asbestos OHS (pending survey)	PPE; restricted access	100% PPE compliance

D. Monitoring Indicators: creek water quality monthly; fuel storage inspections weekly; noise at SP3 weekly; GRM resolution <=14 days.

E. Responsibilities: Contractor – spill prevention, sediment control, noise management; PIU – livelihood restoration; IESM – compliance verification.

7.3 ESMP Summary Matrix (Three PHC Sites – Badagry Axis)

Colour Codes: ● Critical □ Major □ Moderate □ Minor ⛃ Positive

Site	Impact Category	Key Unmitigated Impact	Mitigation Measure	Hierarchy	Significance	Responsible
APA	Biophysical	Coastal erosion / flooding	Elevated platform; oversized drainage	Avoid	□	PIU / Design Contractor
	Biophysical	Asbestos exposure (pending survey)	Licensed survey; abatement if confirmed	Avoid	□	Specialist
	Biophysical	Badagry Creek contamination	Sediment traps;	Minimise	□	Contractor

			bunded storage			
	Social	Labour influx & trans-border mobility	Worker camp rules; CoC	Minimise	□	Contractor
	Social	GBV/SEA/SH	Confidential GRM; survivor-centred response	Avoid/Minimise	●	PIU / GBV Specialist
	Health & Safety	Traffic (Owode-Apa corridor)	Marshals; speed limits	Minimise	□	Contractor
Igbogbele	Biophysical	Asbestos exposure (suspected roofing)	Licensed abatement; HEPA vacuums	Avoid	●	Specialist
	Biophysical	Flooding / drainage congestion	Oversized drainage; elevated slabs	Avoid/Minimise	□	PIU / Contractor
	Biophysical	Localized dust/noise exceedance	Water spraying; noise barriers	Minimise	□	Contractor
	Social	GBV/SEA/SH; reporting barriers	Confidential, anonymous-option GRM	Avoid/Minimise	●	PIU / GBV Specialist

	Health & Safety	Asbestos OHS	PPE; restricted access	Avoid	●	Specialist
Farasime	Biophysical	Asbestos exposure (pending survey)	Licensed survey; abatement if confirmed	Avoid	□	Specialist
	Biophysical	Badagry Creek contamination	Sediment traps; bunded storage	Minimise	□	Contractor
	Biophysical	Localized noise exceedance (SP3)	Noise barriers; scheduling	Minimise	□	Contractor
	Social	GBV/SEA/SH	Confidential GRM; survivor-centred response	Avoid/Minimise	●	PIU / GBV Specialist
	Health & Safety	Fuel spill risk	Emergency spill response plan	Minimise	□	Contractor

7.4 Institutional Responsibilities

Entity	Role	Key Responsibilities
FMEnv	Federal regulator	EIA certification, compliance inspections
LASEPA	State regulator	Permits (air, noise, water), inspections
LAWMA	Waste regulator	Medical & general waste collection, manifests

PIU (LSMoH)	ESMP oversight	Contractor compliance, GRM, reporting, RAP oversight
Contractor(s)	ESMP implementation	CESMP, monitoring, OHS, GBV, waste, community liaison
Facility Operator	Operational ESMP	HMWMP, IPC, wastewater, GRM, maintenance
Licensed Asbestos Contractor	Hazardous materials	Surveys, abatement, air monitoring, disposal
IESM	Independent oversight	Quarterly audits, compliance verification
Badagry LGA / Badagry West LCDA	Local support	Community entry, PAP verification, GRM
AfDB	Financier	Safeguard supervision, compliance enforcement

7.5 Monitoring Plan

Monitoring indicators cover air quality, noise, creek water quality, soil erosion, waste management, labour and GBV risks, and climate resilience across all three sites, selected against the Chapter 5 risks and Chapter 6 mitigation measures.

Site-Specific Monitoring Locations: APA – nearest residential and trading points along the Owode-Apa corridor (air quality, noise, traffic); Igbogbele – residences adjacent to the asbestos-suspected roofing and the SP1/SP2 exceedance locations; Farasime – Badagry Creek downstream sampling points and the SP3 exceedance location.

Corrective Action Procedure: (1) identify exceedance through monitoring, inspection, or GRM complaint; (2) notify the PIU (verbal within 24 hours, written within 48 hours); (3) investigate root cause; (4) implement immediate corrective action; (5) develop a long-term corrective plan if structural; (6) verify effectiveness through follow-up monitoring; (7) report to AfDB for serious or repeated exceedances; (8) update the ESMP if systemic.

TABLE 7.1A – Environmental & Social Monitoring Matrix (Three PHC Sites)

A. Air Quality

Site	Impact	Mitigation	Parameter	Method	Frequency	Responsibility	Trigger

Igbogbele (SP1)	Localized dust exceedance	Water spraying, source control	PM10/PM2.5 (ug/m3)	Real-time monitor	Daily during works	Contractor	>50 ug/m3
APA, Farasime	Construction dust	Water spraying	PM10 (ug/m3)	Real-time monitor	Weekly	Contractor	>50 ug/m3
All sites	Asbestos (pending survey confirmation)	Licensed abatement	Asbestos fibres	PCM/TEM	Continuous during abatement	Specialist	>0.1 f/ml

B. Noise

Site	**Impact**	**Mitigation**	**Parameter**	**Method**	**Frequency**	**Responsibility**	**Trigger**
APA (all SPs)	Corridor traffic/generator noise	Barriers, scheduling	Leq dB(A)	Type 1 meter	Weekly	Contractor	>55 dB(A)
Igbogbele (SP2)	Equipment/community noise	Scheduling, barriers	Leq dB(A)	Type 2 meter	Weekly	Contractor	>55 dB(A)
Farasime (SP3)	Waterfront activity noise	Scheduling, barriers	Leq dB(A)	Type 2 meter	Weekly	Contractor	>55 dB(A)

C. Water Quality

Site	**Impact**	**Mitigation**	**Parameter**	**Method**	**Frequency**	**Responsibility**	**Trigger**
APA, Farasime	Badagry Creek contamination	Sediment traps; bunded storage	TSS, pH, hydrocarbons	Lab analysis	Monthly	Contractor	TSS >30 mg/L

All sites	Sewage	Portable toilets	Coliforms	Membrane filtration	Monthly	Contractor	>0 CFU/100 ml

D. Soil Erosion / Sediment

Site	**Impact**	**Mitigation**	**Parameter**	**Method**	**Frequency**	**Responsibility**	**Trigger**
APA, Farasime	Creek-margin sediment runoff	Sediment traps	Trap condition	Inspection	Weekly	Contractor	>50% full
Igbogbele	Erosion (sandy soils)	Silt fences	Fence condition	Inspection	Weekly	Contractor	Any damage

E. Waste Management

Site	**Impact**	**Mitigation**	**Parameter**	**Method**	**Frequency**	**Responsibility**	**Trigger**
All sites	Poor segregation	Segregated bins	% correct	Inspection	Daily	Contractor	<90%
All sites	Asbestos waste (pending survey)	Licensed disposal	Manifest completeness	Review	Per load	Specialist	Missing manifest
All sites	Medical waste	LAWMA / non-burn disposal	LAWMA receipts	Review	Monthly	Facility Operator	Missing receipt

F. Labour & GBV

Site	**Impact**	**Mitigation**	**Parameter**	**Method**	**Frequency**	**Responsibility**	**Trigger**
APA	Trans-border labour influx	Camp rules	% local hiring	Records	Monthly	Contractor	<50%

All sites	OHS	PPE	% PPE compliance	Inspection	Daily	Contractor	<95%
All sites	GBV	GBV Action Plan	% workers trained	Records	Monthly	Contractor	<100%
All sites	GBV cases	GRM	% resolved	GRM log	Monthly	PIU	Any unresolved

G. Community Health & Safety

Site	Impact	Mitigation	Parameter	Method	Frequency	Responsibility	Trigger
APA	Traffic (Owode-Apa corridor)	Marshals	# incidents	Log	Monthly	Contractor	Any incident
All sites	Access	Fencing	# complaints	GRM	Monthly	PIU	>1 complaint

H. Climate Resilience

Site	Impact	Mitigation	Parameter	Method	Frequency	Responsibility	Trigger
All sites	Flooding	Drainage upgrades; elevated platform (APA)	# flood events	Inspection	After rain	PIU	Any flooding
All sites	Energy	Solar power	Output (kWh)	Logs	Monthly	Facility Operator	–

7.6 Stakeholder Engagement & GRM (Summary)

Engagement activities include quarterly community meetings, disclosure of construction schedules, and fisher/trader-specific engagement at Farasime and APA. The GRM provides multiple entry points (hotline, suggestion boxes, CLOs), GBV-sensitive reporting pathways, 48-hour acknowledgement, 14-day resolution, and quarterly reporting to AfDB. (Full detail at Chapter 9.12.)

7.7 Capacity Building & Training

Training topics: ESMP implementation; OHS and emergency response; GBV/SEA/SH prevention; HMWMP and IPC; creek-margin/biodiversity protection; spill response; asbestos handling (all three sites, pending survey confirmation).

7.8 Reporting Framework

Contractor -> PIU: monthly E&S reports. Facility Operator -> PIU: quarterly operational reports. PIU -> AfDB/FMEnv:monthly and annual reports. IESM -> AfDB: quarterly audit reports.

7.9 ESMP Budget & Implementation Schedule

The Environmental and Social Management Plan (ESMP) budget has been developed specifically for the three PHC facilities in the Badagry Axis (APA, Igbogbele, and Farasime). The total estimated cost for the construction phase is US$350,000 (approximately ₦525 million) , with annual operational costs estimated at US$30,000–US$40,000 (approximately ₦45M–₦60M) .

7.9.1 Site-Specific ESMP Budget Breakdown

Table 7.2A provides a detailed breakdown of ESMP costs disaggregated by site, reflecting the distinct environmental and social sensitivities of each PHC facility.

Table 7.2A: Site-Specific ESMP Budget Breakdown by Component

ESMP Component	APA PHC (₦)	Igbogbele PHC (₦)	Farasime PHC (₦)	Total (₦)	Total (US$)	Responsible
Air Quality Monitoring	2,500,000	4,000,000	2,500,000	9,000,000	6,000	Contractor / PIU
Focus (SP1 daily during works)	—	*Igbogbele SP1*	—	—	—	—
Noise Monitoring	2,000,000	2,000,000	2,000,000	6,000,000	4,000	Contractor
Creek Water Quality Monitoring	4,000,000	—	4,000,000	8,000,000	5,333	Contractor
Asbestos Survey & Abatement	15,000,000	35,000,000	20,000,000	70,000,000	46,667	Specialist Contractor
Survey (all sites)	5,000,000	5,000,000	5,000,000	—	—	—
Abatement (confirmed sites)	—	*Roofing (50-100m²)*	*Aged structures*	—	—	—
Air monitoring	Included	Included	Included	—	—	—
Asbestos PPE	1,500,000	2,500,000	1,500,000	5,500,000	3,667	Contractor
Erosion / Sediment Control	3,000,000	3,000,000	3,000,000	9,000,000	6,000	Contractor
Creek margins	*Badagry Creek*	*Sandy soils*	*Badagry Creek*	—	—	—
Dust Control	2,000,000	2,500,000	2,000,000	6,500,000	4,333	Contractor
Traffic Management	6,000,000	—	—	6,000,000	4,000	Contractor
(Owode-Apa corridor)	*Yes*	—	—	—	—	—
Fuel Spill Prevention	2,000,000	2,000,000	5,000,000	9,000,000	6,000	Contractor

(Waterfront)	—	—	*Yes*	—	—	—
Waste Management	5,000,000	5,000,000	5,000,000	15,000,000	10,000	Facility Operator
(LAWMA / non-burn)	*All sites*	*All sites*	*All sites*	—	—	—
(Fisherfolk/traders)	*High*	*Medium*	*High*	—	—	—
GBV/SEA/SH Action Plan	8,000,000	6,000,000	7,000,000	21,000,000	14,000	PIU / Contractor
Labour Influx Management	6,000,000	—	2,000,000	8,000,000	5,333	Contractor
(Trans-border)	*Yes*	—	—	—	—	—
Stakeholder Engagement	4,000,000	4,000,000	4,000,000	12,000,000	8,000	PIU
GRM Implementation	2,000,000	2,000,000	2,000,000	6,000,000	4,000	PIU
IESM Quarterly Audits	10,000,000	10,000,000	10,000,000	30,000,000	20,000	IESM
Climate Resilience	25,000,000	20,000,000	20,000,000	65,000,000	43,333	Contractor / PIU
Elevated platform	*Yes*	—	—	—	—	—
Oversized drainage	*Yes*	*Yes*	*Yes*	—	—	—
Elevated electricals	*Yes*	*Yes*	*Yes*	—	—	—
Sub-Total	138,000,000	134,000,000	128,000,000	400,000,000	266,667	—
Contingency (10%)	13,800,000	13,400,000	12,800,000	40,000,000	26,667	PIU
Sub-Total	151,800,000	147,400,000	140,800,000	440,000,000	293,333	—
Management & Supervision (15%)	22,770,000	22,110,000	21,120,000	66,000,000	44,000	PIU
TOTAL	174,570,000	169,510,000	161,920,000	506,000,000	337,333	—

Note: Values are approximate and based on Nigerian market rates (2026). Exchange rate: US$1 = ₦1,500 (indicative).

7.9.2 Site-Specific Budget Summary

Table 7.20B provides a summary of the Site-Specific ESMP Budget.

Table 7.2B: Site-Specific ESMP Budget Summary

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

7.9.3 Site-Specific Justification for Budget Variations

Site	Key Cost Drivers	Rationale
APA PHC	Elevated platform design; Traffic Management Plan (Owode-Apa corridor); Trans-border labour influx; Creek protection	New construction on flood/erosion-exposed coastal parcel; border proximity; high patient load
Igbogbele PHC	Asbestos abatement (roofing 50–100m²); Flood-resilient drainage; High water table mitigation; Localized air/noise monitoring	Confirmed ACM in roofing; flood-prone zone; border-proximity reporting barriers
Farasime PHC	Asbestos survey (aged structures); Creek water quality monitoring; Fuel spill prevention (waterfront); Fisheries livelihood restoration	Badagry Creek waterfront; tidal inundation; fisheries dependency (>60% household income)

7.9.4 Implementation Schedule

Table 7.20C depicts the ESMP Implementation Schedule by Phase.

Table 7.2C: ESMP Implementation Schedule by Phase

Phase	Duration	Key Activities	Site-Specific Focus
Pre-Construction	6–12 months	Asbestos surveys (all 3 sites); CESMP approval; Stakeholder engagement; GRM activation; RAP implementation	All sites (asbestos surveys pending confirmation)
Construction	12–18 months per facility (staggered)	Full ESMP implementation and monitoring; GBV training; Traffic management (APA); Creek protection (APA/Farasime); Quarterly IESM audits	APA: Traffic management; Igbogbele: Asbestos abatement; Farasime: Creek protection
Operation	Year 2 onward	HMWMP; IPC compliance; Wastewater management; Solar maintenance; Quarterly PIU reporting; Annual ESMP review	All sites (operational phase)

Figure 7.10 depicts the ESMP Implementation Timeline.

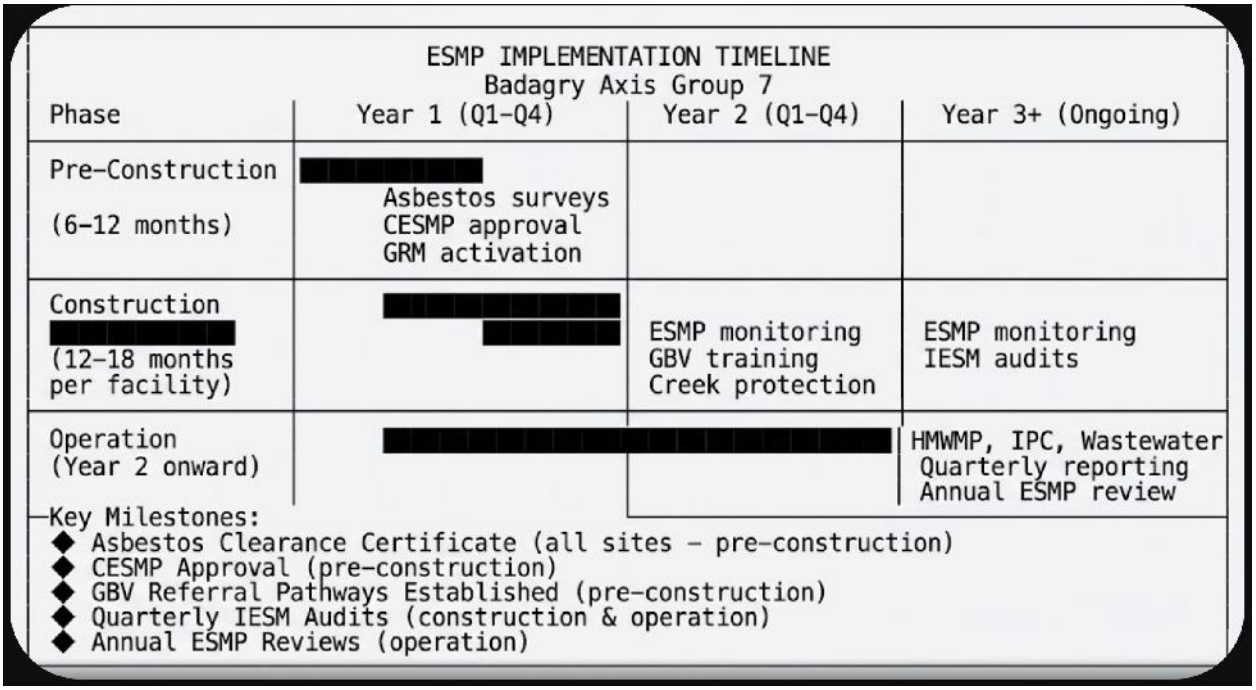


Figure 7.2: ESMP Implementation Timeline

7.9.5 Budget Verification Statement

The ESMP budget presented in Section 7.10 has been developed specifically for the three PHC facilities in the Badagry Axis (APA, Igbogbele, and Farasime). The total budget (US$337,333 / approximately ₦506 million) is higher than comparative reports from other axes (₦220M–₦280M) due to the following site-specific factors:

1. Resettlement Action Plan (RAP) – APA, Igbogbele, Farasime

- No physical displacement is associated with the three Badagry Group 7 project sites. The resettlement baseline screening confirms that zero residential structures, zero businesses, and zero farmlands fall within the project footprints at APA, Igbogbele, and Farasime. All land parcels are government-owned and gazetted.

2. Asbestos Abatement (Igbogbele & Farasime)

- **Igbogbele PHC:** Asbestos in roofing (50–100 m²)
- **Farasime PHC:** Aged infrastructure likely containing hazardous materials
- **APA PHC:** Aged ancillary structures
- Licensed survey, wet removal, air monitoring, and hazardous waste disposal at all 3 sites

3. Coastal and Riverine Adaptations

- **Elevated-platform design** at APA to design out flood risk
- **Creek-margin protection** at APA and Farasime (sediment traps, shoreline stabilisation)
- **Marine-grade materials** to withstand salt-air corrosion (aluminum-zinc roofing, anti-corrosive coatings)

4. Flood-Resilient Infrastructure

- Oversized drainage (1:100-year storm + 30% climate factor) at all 3 sites
- Elevated floor slabs and electrical panels
- Flood contingency planning for Igbogbele and Farasime

5. Trans-Border Labour Dynamics (APA)

- Enhanced labour management due to cross-border worker mobility
- Extended GBV/SEA/SH prevention measures

6. Water Quality and Creek Protection

- **Zero-discharge requirement** to Badagry Creek
- Bunded fuel storage and spill prevention

- Sediment traps and no wash-water discharge

7. Fisheries and Livelihood Restoration

- Over 60% of household income in Farasime and Igbogbele is directly derived from the Badagry Creek ecosystem
- Higher livelihood restoration costs reflect this dependency

7.9.6 Total Estimated ESMP Cost

Below is the Total Estimated ESMP Cost: .

Phase	Estimated Cost (₦)	Estimated Cost (US$)
Construction Phase	~506,000,000	~337,333
Annual Operational Phase	39,000,000 – 52,000,000	26,000 – 34,667

The budget estimates are based on Nigerian market rates, AfDB safeguard requirements, and typical ESMP implementation budgets for similar Category 1 health infrastructure projects in Nigeria.

Chapter 7 has presented the complete ESMP for APA, Igbogbele, and Farasime PHCs, translating the Chapter 6 mitigation measures into an enforceable, site-specific framework covering institutional responsibilities, monitoring, corrective action, stakeholder engagement, capacity building, reporting, and a costed budget and schedule aligned with the axis ESMP totals.

CHAPTER 8 – HAZARDOUS AND MEDICAL WASTE MANAGEMENT, DECOMMISSIONING AND RESTORATION PLAN

8.1 Introduction

This chapter presents two complementary frameworks for the Badagry Group 7 Axis: **(1)** the Hazardous and Medical Waste Management Plan (HMWMP), applying to construction/refurbishment and operational phases across APA, Igbogbele, and Farasime, with particular emphasis on preventing any discharge of waste to Badagry Creek; and **(2)** the Decommissioning and Restoration Plan required by FMEnv for end-of-life facility management, notwithstanding the 50+ year expected operating life.

AfDB ISS (OS4), 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.

PART A: HAZARDOUS AND MEDICAL WASTE MANAGEMENT PLAN (HMWMP)

Generally, rural communities across the Badagry Axis currently lack structured waste management services, resulting in a high reliance on informal disposal methods such as roadside dumping, open burning, and discharging mixed municipal waste (dominated by organics and plastics) into drainage channels flowing toward Badagry Creek. Specific assessments at APA and Igbogbele Primary Health Centres (PHCs) revealed unsegregated minimal medical waste and significant sludge accumulation within septic tanks and wash-down areas. Visual assessments confirm this sludge presents high potential pathogen loads, posing severe contamination risks to groundwater and surface runoff, particularly in the flood-prone zones of Igbogbele.

To directly address these baseline findings and the associated ecosystem risks, the ESMP implements structured containment and evacuation protocols aligned with AfDB ISS, FMEnv, and IFC EHS guidelines.

Under this plan, the Contractor, PHC Management, and LASEPA-approved operators are responsible for execution, monitored through monthly visual checks and quarterly documentation reviews. Key management actions include:

Executing scheduled septic tank and drainage sludge evacuations using licensed contractors and sealed containment to prevent environmental discharge.

Enforcing PPE requirements for workers and maintaining strict waste manifests.

Upgrading drainage channels in flood-prone zones (Igbogbele) to prevent overflow and contamination during flood events.

Successful implementation aims for zero uncontrolled sludge discharges and 100% compliant disposal documentation.

8.2 Objectives

Protect healthcare workers, patients, waste handlers, and communities; prevent contamination of Badagry Creek, soil, groundwater, and air; ensure regulatory compliance; establish an enforceable segregation-to-disposal system with non-burn treatment (per the axis ESMP commitment); minimise waste generation; build capacity; establish monitoring and emergency response procedures.

8.3 Regulatory Framework

As listed in Section 8.1, applied identically across all three sites.

8.4 Healthcare Waste Categories (WHO Classification, AfDB OS4-Aligned)

Category	Colour Code	Treatment / Disposal
General Waste	Black	LAWMA landfill
Infectious Waste	Yellow	Non-burn treatment (autoclave) -> landfill
Sharps	Red	Licensed treatment / disposal
Pharmaceutical Waste	Brown	Return to manufacturer / licensed disposal
Chemical Waste	Blue	Licensed hazardous waste contractor
Asbestos (pending survey, all 3 sites)	Special label	Hazardous waste landfill

No open burning; no discharge of any waste stream to Badagry Creek – a defining requirement for this axis given the creek's centrality to community fisheries and cross-border trade.

8.5 Waste Management System Overview

Follows the WHO hierarchy: minimisation -> segregation at source -> collection & storage -> internal/external transport -> non-burn treatment -> final disposal (LAWMA / licensed hazardous waste landfill).

8.6 Waste Minimisation

Bulk ordering, inventory control (<1% expired pharmaceuticals), safe reuse of sterilisable items, mercury elimination (digital thermometers), reusable/autoclavable sharps containers where appropriate, 100% staff compliance with segregation at source.

8.7 Waste Segregation at Source

WHO colour-coded bins at all three facilities; bags sealed and labelled with facility name, date, category; segregation compliance target ≥95%; sharps in black bags target zero; training compliance 100%.

8.8 Collection, Internal Transport, and Storage

Daily collection using dedicated trolleys; bins cleaned with 0.5% chlorine; lockable, ventilated, impermeable-floor storage; maximum 48-hour storage for infectious waste.

8.9 Waste Treatment Technologies

Non-burn treatment (autoclave, 121 C / 30 min / 15 psi, monthly biological indicator testing) as the axis standard, consistent with the "small-scale non-burn medical waste treatment facilities" specified for the axis in Chapter 3; chemical disinfection (0.5–1% chlorine, 30-minute contact) for small liquid volumes.

8.10 Asbestos Management Plan (Cross-Reference)

See the standalone Asbestos Management Plan (Appendix 6 for full procedures. Summary:

Site	Status	Notes
Igbogbele	Suspected (roofing)	Flagged in Chapter 4 baseline and community consultations
APA	Aged ancillary structures; flagged as an unmitigated risk factor in Table 9.4	Pre-construction survey required
Farasime	Aged infrastructure likely containing hazardous materials	Pre-construction survey required

Pre-removal surveys at all three sites by a licensed FMEnv-accredited assessor; wet-method removal; clearance monitoring <=0.01 f/ml; hazardous waste landfill disposal with manifest.

8.11 Occupational Health and Safety for Waste Handlers

PPE by task (gloves, aprons, boots, masks; puncture-proof gloves for sharps; P3 respirators and Type 5 coveralls for asbestos work); Hepatitis B vaccination; tetanus booster; needle-stick protocol (PEP within 72 hours); annual medical surveillance; asbestos medical surveillance where abatement occurs.

8.12 Spill Response Plan

Small chemical spills – absorb, hazardous bag; large chemical spills – evacuate, contain; infectious spills – PPE, chlorine, yellow bag; fuel/oil spills (particular relevance at the Farasime waterfront and APA Creek-margin works) spill kit, report to NOSDRA. Any spill or discharge risk to Badagry Creek triggers immediate containment and notification to LASEPA/NOSDRA within 24 hours.

8.13 Monitoring and Reporting

Waste generation, segregation compliance, autoclave parameters, manifests, LAWMA collection, asbestos monitoring (all 3 sites pending survey), needle-stick incidents, training compliance.

8.14 Roles and Responsibilities

The institutional structure for HMWMP implementation across the Badagry Group 7 Axis is as follows:

Entity	Responsibility
Facility Manager	Overall waste management oversight; compliance with HMWMP
Clinical Staff	Segregation at source; proper use of colour-coded bins
Waste Handler	Collection, internal transport, storage; cleaning of bins
Facility Supervisor	Daily monitoring of segregation compliance; training
LAWMA	General waste collection; medical waste collection (non-burn treatment)
Licensed Hazardous Waste Contractor	Asbestos abatement; chemical waste disposal; pharmaceutical waste disposal
PIU (LSMoH)	Oversight; reporting to AfDB/FMEnv; compliance verification
LASEPA	Regulatory compliance; permits; inspections
AfDB	Safeguard supervision; compliance enforcement

8.15 Budget Estimate (HMWMP + Decommissioning, Three PHC Sites)

Capital costs (autoclave, waste storage construction, spill kits, PPE, asbestos abatement pending survey at all 3 sites), operational costs (LAWMA/non-burn treatment fees, hazardous waste contractor, autoclave maintenance, training), and decommissioning costs (demolition, asbestos removal if present, site and creek-margin restoration, borehole/septic decommissioning) are consolidated within the axis's US$350,000 ESMP allocation and the site-level costed items in Section 7.10; asbestos abatement costs are contingent on the outcome of the pre-construction surveys at all three sites.

PART B: DECOMMISSIONING AND RESTORATION PLAN

8.16 Introduction

Although the PHC facilities in the Badagry Axis are expected to operate for 50+ years, FMEnv requires a Decommissioning and Restoration Plan in every ESIA. This plan covers safe removal of hazardous materials, demolition, waste management, restoration of Badagry Creek margins and any affected riverine/wetland fringe habitat, and protection of worker and community health and safety.

8.17 Objectives

As per the template (Section 8.17 of the Ikorodu structure), applied to the Badagry Axis: safe removal and disposal of hazardous materials; minimised dust/noise/erosion/water-pollution impacts during demolition; worker and community OHS protection; site restoration to a stable and environmentally acceptable condition; rehabilitation of Badagry Creek margins and any wetland/riverine fringe features; maintained community access; regulatory compliance; clear roles and monitoring.

8.18 Decommissioning Strategy and Activities

8.18.1 Physical Infrastructure:

Equipment salvage (medical equipment, solar panels, batteries – hazardous waste handling and recycling); building demolition (dust suppression, noise control, asbestos removal if present, OHS); demolition waste management (segregation, recycling, LAWMA disposal); site restoration (regrading, native revegetation, slope stabilisation – with particular attention to creek-margin stabilisation at APA and Farasime).

8.18.2 Utilities and Ancillary Infrastructure:

Septic tank decommissioning (sludge treated as hazardous waste; groundwater protection); borehole decommissioning (sealing with grout); rainwater harvesting system removal; solar PV system removal (battery hazardous waste, panel recycling).

8.19 Environmental Restoration Measures

8.19.1 Badagry Creek Margins and Riverine/Wetland Fringes

Site	Restoration Measure
APA (Badagry Creek / coastal margin)	Restore shoreline; replant native mangroves or coastal vegetation where present; remove invasive species; reinstate erosion controls
Farasime (Badagry Creek waterfront)	Restore creek margin and any disturbed shoreline; replant native riparian vegetation; remove invasive species
Igbogbele (riverine/wetland fringe)	Restore hydrology and drainage function; replant native wetland-fringe species; remove invasive species

8.19.2 Soils and Erosion Control:

Regrade to original contours; apply stored topsoil and revegetate; silt fences and check dams until vegetation reaches ≥80% cover – with priority at Igbogbele's flood-prone, erosion-sensitive terrain.

8.19.3 Air Quality and Noise Management:

Water spraying during demolition; restricted demolition hours (7:00–18:00); minimum 7 days' community notification – particularly important at Igbogbele and Farasime, where clinical services may still be transitioning.

8.20 Socio-Economic and Cultural Restoration

8.20.1 Livelihood Transition and Support:

3-month advance notice; skills training and job-placement assistance for fishing and trading households; donation of usable equipment to nearby health facilities.

8.20.2 Community Infrastructure and Access:

Restore access roads including the Owode-Apa corridor at APA; remove demolition debris; ensure drainage to prevent standing water.

8.20.3 Cultural Heritage Protection:

Chance Finds Procedure during demolition at all three sites; stop-work protocol; notification to the relevant heritage authority for archaeological assessment.

8.21 Monitoring and Reporting

Parameter	**Indicator**	**Frequency**	**Responsible**
Asbestos removal (if present)	Waste manifests; air monitoring	Per load; continuous	Licensed contractor
Site / creek-margin restoration	Vegetation survival ≥80%	3, 6, 12 months	Contractor / PIU
Erosion control	Silt fence condition	Weekly	Contractor
Creek / groundwater quality	pH, TDS, coliforms, heavy metals	Quarterly (1 year)	Contractor / PIU
Community satisfaction	≥80% satisfied	Post-decommissioning	PIU / IESM

8.22 Institutional Responsibilities

PIU oversight, compliance, community liaison; Contractor – safe demolition, waste management, restoration; Licensed Asbestos Contractor survey, abatement, disposal (all 3 sites); Facility Operator – handover, equipment salvage; LASEPA/FMEnv – permits, inspections; AfDB review and monitoring.

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 APA, Igbogbele, and Farasime 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 – SITE-SPECIFIC GBV/SEA/SH ACTION PLAN

9.1 Introduction

This GBV/SEA/SH Action Plan applies to the three PHC facilities assessed in this ESIA:

- APA PHC (new construction, Owode-Apa corridor, trans-border labour mobility, flood-exposed)
- Igbogbele PHC (flood-prone zone, border proximity affecting reporting)
- Farasime PHC (Badagry Creek waterfront, riverine/fishing community)

Per the Group 7 report's own risk assessment (Table 9.4), APA and Farasime carry a Medium-High GBV/SEA/SH risk rating; Igbogbele carries a Medium rating. All three sites show unmitigated risk factors including labour influx, poor lighting, lack of confidential reporting, economic vulnerability, flood risk, police-response gaps, and cultural norms; Farasime additionally reflects its riverine-community context.

9.2 Legal and Policy Framework

Nigerian laws: VAPP Act (2015), Labour Act (2004), Child Rights Act (2003), Criminal Code (2004), Lagos State Domestic Violence Law (2007). International standards: AfDB OS5, IFC Good Practice Note on GBV/SEA/SH (2020), ILO Conventions 155 & 190, WHO/ILO Health Worker Safety Guidance (2020), UN Guiding Principles on Business & Human Rights, WHO Clinical Management of Rape Guidelines (2024).

9.3 GBV/SEA/SH Risk Assessment

Table 9.1 – GBV Risk Factors Identified in the APA, Igbogbele and Farasime PHCs

PHC	Risk Factors (all Unmitigated)	Risk Level
APA	Labour influx; poor lighting; lack of confidential reporting; economic vulnerability; asbestos abatement; flood risk; police response; cultural norms	Medium-High
Igbogbele	Labour influx; poor lighting; lack of confidential reporting; economic vulnerability; flood risk; police response; cultural norms	Medium
Farasime	Labour influx; riverine communities; poor lighting; lack of confidential reporting; economic vulnerability; asbestos abatement; police response	Medium-High

High-Risk Scenarios: worker-community SEA (exchange of money/goods for sex); worker-worker SH (quid pro quo harassment); GBV against vulnerable groups (girls, women with disabilities); child sexual abuse (zero tolerance); survivor reports but receives no response; community protest due to unaddressed GBV incidents; trans-border labour dynamics at APA complicating both recruitment screening and survivor access to cross-jurisdiction services.

9.4 Prevention Measures

9.4.1 Code of Conduct (CoC):

All workers, subcontractors, and security personnel at APA, Igbogbele, and Farasime must sign a GBV/SEA/SH Code of Conduct prohibiting sexual harassment, exploitation or abuse, sexual activity with minors, intimidation or retaliation, alcohol/drug use on site, and relationships with community members where a power imbalance exists. Translated into Yoruba and Pidgin; displayed at all sites; re-signed every 6 months.

9.4.2 Mandatory Training:

Workers (induction, monthly toolbox talks, supervisor-specific training, GRM focal-point training); community (quarterly awareness sessions, women's-group engagement, youth sessions, traditional/religious leader sensitisation with attention to trans-border community members at APA); facility operators (recognising survivors, confidential medical management, referral pathways).

9.4.3 Safe Recruitment Practices:

Nno hiring of minors; background checks for security personnel, including verification appropriate to APA's trans-border worker pool; gender-balanced hiring (target ≥20% female); written contracts including CoC and GRM information.

9.4.4 Community-Level Prevention:

Quarterly awareness campaigns; women's safe spaces at all three PHCs; improved (solar) lighting – a risk factor common to all three sites; participatory safety audits with women and girls; engagement with fisher and trader associations (Farasime, APA).

9.5 Response Measures

9.5.1 Survivor-Centred Approach:

Confidentiality, safety, respect, non-discrimination, no retaliation, informed consent, right to refuse services.

9.5.2 Reporting Channels:

Hotline (SMS/WhatsApp) with a female GBV focal point; locked suggestion boxes; female GRM focal points; community liaison officers; supervisor reporting; anonymous online GRM portal – designed specifically to overcome the "lack of confidential reporting" risk factor common to all three sites and the additional border-proximity barrier at Igbogbele.

9.5.3 Referral Pathways (per the Group 7 report's own structured pathway, Table 9.14):

Table 9.2: Referral Pathways

Step	Service Area	Service Providers	Safeguard
1	Entry Point	Health workers, police, NGOs, community leaders	MoU to maintain confidentiality and believe the survivor
2	Safety and Support	Any trained personnel	MoU to prioritise safety
3	Health Services	Hospitals, clinics	MoU to obtain informed consent
4	Psychosocial Support	Counsellor, NGO	MoU to respect survivor's pace, ensure privacy
5	Justice Services	Case managers, GBV focal personnel	MoU to avoid coercion; legal advice
6	Protection Services	Social welfare, NGOs	Ensure protection safety planning
7	Referral Coordination	Case managers, GBV focal person	Ensure smooth, confidential handover
8	Case Management	Case manager, social worker	Ongoing follow-up

Referral agreements (MOUs) with named service providers will be finalised and in place before construction begins at any of the three sites, with particular attention to arrangements accessible to APA's trans-border community.

9.6 Sanctions for Violations

Verbal warning -> written warning -> suspension -> termination -> legal prosecution (rape, sexual activity with a minor, assault). Applies equally to workers, subcontractors, and security personnel at all three sites.

9.7 Monitoring & Evaluation

Indicator	Target	Frequency
Workers trained	100%	Monthly
Community members reached	≥60%	Quarterly
GBV incidents reported	Tracked	Monthly
Cases resolved <=14 days	≥90%	Monthly
Survivor satisfaction	≥80%	Quarterly
CoC compliance	100%	Monthly

Reporting: Contractor -> PIU monthly; PIU -> AfDB quarterly; IESM -> AfDB quarterly audits.

9.8 Roles & Responsibilities

PIU – oversight, reporting, GRM management, coordination with service providers; Contractor – CoC enforcement, training, reporting, sanctions; GBV Specialist – training, case management, referral coordination; Facility Operator – survivor medical management, confidentiality; IESM – independent verification; Community Leaders – awareness, safe spaces, referrals.

9.9 GBV/SEA/SH Summary Matrix

Colour Codes: ● Critical □ Major □ Moderate □ Minor ◍ Positive

Risk Category	**Site(s)**	**Unmitigated Risk**	**Mitigation / Action**	**Significance**	**Responsible**
Worker-Community SEA	All sites (highest at APA – trans-border influx)	Workers offering money/goods/jobs for sex	CoC (zero tolerance); induction + monthly training; confidential reporting; sanctions	● Critical	Contractor / PIU / GBV Specialist
Worker-Worker SH	All sites	Quid pro quo harassment	Supervisor training; CoC enforcement	□ Major	Contractor / PIU
Child Sexual Abuse (<18 yrs)	All sites	Sexual activity with minors	CoC prohibition; background checks; community awareness	● Critical	Contractor / PIU / GBV Specialist
GBV Against Vulnerable Groups	All sites (poor lighting a common factor)	Women/girls on isolated paths	Solar lighting; safe spaces; community awareness	□ Major	PIU / Contractor / LGA

Lack of Confidential Reporting	All sites; compounded by border proximity at Igbogbele	Survivors fear retaliation	Hotline; suggestion boxes; anonymous reporting	● Critical	PIU / GBV Specialist
Economic Exploitation	Farasime (fishers/traders); APA (traders)	Vulnerability to SEA	Women's-group engagement; livelihood support	□ Major	PIU / GBV Specialist
Cultural Norms Supporting GBV	All sites	Acceptance of violence; silence around GBV	Community sensitisation; leader engagement	□ Major	PIU / GBV Specialist
Poor Police Response	All sites	Survivors discouraged from reporting	Referral pathway MOUs; legal aid	□ Major	PIU / GBV Specialist
Flood-Related Displacement Risk	APA, Igbogbele	Flooding heightens vulnerability	Flood-resilient design; contingency planning	□ Major	PIU / Contractor
Survivor Reports but No Action	All sites	GRM fails to respond -> re-traumatisation	48-hr acknowledgement; 14-day resolution; monitoring	● Critical	PIU / Contractor

9.10 Budget Estimate

GBV/SEA/SH Action Plan costs for the three sites (training, GBV Specialist consultant, awareness materials, GRM setup, referral-pathway MOUs) are included within the axis's US$350,000 costed ESMP (Section 7.10).

9.11 Stakeholder Engagement, Consultation & GRM

9.11.1 Stakeholder Engagement Process

9.11.1.1 Consultation Activities

Consultations were conducted 24–27 February 2026 across APA, Igbogbele, and Farasime. 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.

Below is an overview of the key community engagement and assessment activities conducted across all project sites, highlighting the purpose and coverage of each intervention

Activity	Description	Sites Covered
1. Community Entry Meetings	Introductory meetings with traditional leaders (Baales, Chiefs) and community representatives to explain project scope, seek acceptance, and establish engagement protocols	All sites
2. Focus Group Discussions (FGDs)	Gender-segregated and stakeholder-specific discussions with women, youth, fishers, traders, and vulnerable groups	All sites
3. Key Informant Interviews (KIIs)	In-depth interviews with traditional leaders, PHC staff, LGA officials, and community-based organisation leaders	All sites
4. Site Walkthroughs	Environmental and social assessment walkthroughs of each facility with community members	All sites
5. GBV/SEA/SH Screening	Risk identification and reporting-channel assessment using participatory safety audits with women and girls	All sites

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 through town hall meetings.

9.11.1.2 Stakeholder Mapping

Stakeholders were systematically mapped using a tiered approach to ensure all affected and interested parties were identified and engaged. The mapping process considered:

- **Impact Level:** Directly affected (host communities) vs. indirectly affected (wider catchment, service providers)
- **Influence:** Decision-makers (LGA, LSMoH) vs. community influencers (traditional leaders, women's groups)
- **Vulnerability:** Vulnerable groups requiring targeted engagement (women, youth, elderly, persons with disabilities, migrants/trans-border workers)

Stakeholder Category	APA	Igbogbele	Farasime	Engagement Method
Primary Stakeholders	Traders, transport operators, migrant/trans-border workers	Farmers, residents near asbestos-suspected structures	Coastal fishers, boat operators, fish smokers	FGDs, KIIs, site walkthroughs
Traditional Leaders	Baale/Chief, Alapa of Apa	Baale, community elders	Baale, community elders	Community entry meetings, KIIs
Vulnerable Groups	Women, youth, elderly, persons with disabilities	Women, youth, elderly	Women, youth, elderly, fisher households	Gender-segregated FGDs
Secondary Stakeholders	Badagry LGA/Badagry West LCDA officials, LSMoH, LASEPA, LAWMA, NESREA, FMEnv, WAPA	Same as APA	Same as APA	Regulatory meetings, workshops
GBV Service Providers	DSVA/DVSRT, Mirabel Centre	DSVA/DVSRT, Mirabel Centre	DSVA/DVSRT, Mirabel Centre	Referral pathway MOUs

Stakeholder Mapping Summary:

- **Primary Stakeholders (Directly Affected):** host communities including informal traders, fishers, farmers, and transport operators whose livelihoods or access may be temporarily affected during construction.
- **Traditional and Community Leaders:** Baales, Chiefs, Alapa of Apa, religious leaders (Imam), and CDA chairpersons who influence community acceptance and facilitate grievance resolution.
- **Vulnerable Groups:** Women, youth, elderly, persons with disabilities, and trans-border workers who require targeted engagement and specific safeguards.
- **Secondary Stakeholders:** Regulatory agencies (LASEPA, LAWMA, NESREA, FMEnv), implementing agencies (LSMoH, PIU), health sector partners (WAPA, PHCB), and GBV service providers.
- **Financiers and Oversight:** AfDB (financier) and IESM (independent monitoring).

9.11.1.3 Key Concerns Raised and Project Responses

Concern Raised	Stakeholder Group	Project Response	ESIA Reference
Flooding, drainage, and access to safe drinking water	Community leaders, all sites	Elevated platform at APA; oversized drainage (1:100-year + 30%); elevated electricals	Chapter 3, Chapter 6
Protection of fishing and trading livelihoods	Fishers, traders, APA, Farasime	Creek protections, access maintenance, livelihood safeguards, LRP provisions	Section 4.8.10, Chapter 6
Employment for locals	Youth groups, all sites	≥50% local hiring target; local procurement preference	Section 3.11
Safe handling of asbestos and medical waste	PHC staff, Igbogbele, Farasime	Licensed abatement with air monitoring; non-burn HMWMP with LAWMA disposal	Chapter 8
Security and lighting	Women's groups, all sites	Solar lighting, perimeter fencing, security coordination	Chapter 9
Confidential GBV reporting	Women's groups, all sites	Survivor-centred confidential channels; female focal points; anonymous options	Chapter 9

Dust and noise during construction	Residents, all sites	Dust suppression (water spraying, covered stockpiles); noise barriers, restricted hours	Chapter 6

9.11.2 Grievance Redress Mechanism (GRM)

9.11.2.1 GRM Process Overview

The Grievance Redress Mechanism (GRM) is designed to provide an accessible, transparent, and timely process for receiving, processing, and resolving project-related complaints. The GRM is operational throughout the project lifecycle (pre-construction, construction, and operation) and is available to all project-affected persons, including community members, workers, and vulnerable groups.

9.11.2.2 GRM Entry Points

Channel	Description	Accessibility
Toll-Free Hotline	Dedicated phone number for verbal complaints	Available 24/7; accessible to illiterate persons
Suggestion Boxes	Locked boxes located at each PHC, community hall, and market	Anonymous; accessible to all
Female GRM Focal Points	Designated female staff to receive GBV/SEA/SH complaints	Confidential; survivor-centred
Community Liaison Officers (CLOs)	Site-based officers who receive complaints directly	Daily presence at sites
Anonymous Reporting	Online portal and written submissions	Confidential; protects complainants
Supervisor Reporting	Workers can report grievances directly to supervisors	Worker-friendly

9.11.2.3 GRM Process Timeline and Responsibilities

Step	Action	Timeline	Responsible	Outcome
1. Receipt & Logging	Complaint received via any entry point; logged into central GRM register with unique ID	Day 1	CLO / GRM Focal Point	Complaint documented and tracked

2. Acknowledgment	Complainant formally acknowledged via SMS, phone call, or written note	Within 48 hours	GRM Focal Point	Complainant informed of process
3. Screening & Categorisation	Complaint screened for urgency, sensitivity (GBV cases prioritised and handled confidentially), and complexity	Days 2–3	PIU GRM Focal Point / GBV Specialist	Complaint categorised (low, medium, high)
4. Investigation	PIU and Contractor investigate; site visits and stakeholder interviews conducted	Days 3–10	Contractor / PIU / CLO	Facts established
5. Resolution & Feedback	Proposed resolution communicated to complainant; if accepted, mitigation action implemented	Within 14 days	PIU / Contractor	Case closed; complainant satisfied
6. Appeal	If unresolved, complainant appeals to LGA Liaison Committee	Days 15–21	LGA Liaison Committee	Case escalated
7. Final Appeal	If still unresolved, escalated to LSMoH / AfDB Independent Recourse Mechanism	Beyond 21 days	LSMoH / AfDB	Final determination

9.11.2.4 GRM Tiered System

Below is the GRM tiered system:

Tier	Level	Responsible	Function
Tier 1	PHC / Community Level	CLOs, GRM Focal Points, Traditional Leaders	Receipt, acknowledgment, initial resolution (Level 1 grievances)

Tier 2	LGA Liaison Level	Badagry LGA / Badagry West LCDA Environmental Health Officer	Escalation and mediation (unresolved Tier 1 grievances)
Tier 3	PIU Level	PIU GRM Focal Point / Safeguards Team	Investigation, resolution, escalation to regulators
Tier 4	Regulatory / Financier Level	FMEnv, LASEPA, AfDB	Final appeal and independent recourse

9.11.2.5 GBV/SEA/SH Complaint Handling

GBV/SEA/SH complaint handling is outlined below:

Feature	Description
Confidential Handling	GBV cases are handled with strict confidentiality; only essential personnel are involved
Survivor-Centred Approach	Confidentiality, safety, respect, no retaliation, informed consent, right to refuse services
Female Focal Points	Dedicated female GRM focal points available at all sites
Anonymous Reporting	Anonymous options available to protect survivors from retaliation
Referral Pathways	Medical (PEP within 72 hours), psychosocial, legal, and protection services via MOUs
Timely Response	Acknowledgement within 48 hours; resolution within 14 days

9.11.2.6 GRM Reporting and Monitoring

Report	**Frequency**	**From – To**	**Content**
GRM Monthly Summary	Monthly	Contractor / CLO → PIU	Number of complaints received, resolved, pending; types of complaints; resolution times
GRM Quarterly Report	Quarterly	PIU → AfDB	GRM performance; trends; corrective actions; GBV case summary (anonymised)
GRM Annual Review	Annually	PIU	GRM effectiveness; recommendations for improvement

9.11.3 GRM Cost Estimate

Cost Item	Description	Estimated Cost (US$)
Hotline Setup & Maintenance	Toll-free line; monthly operational costs	**1,500**
Suggestion Boxes	Supply, installation, and regular collection	**500**
GRM Focal Point Stipends	Stipends for female GRM focal points and CLOs	**2,000**
Registers & Documentation	GRM registers, forms, and reporting templates	**500**
Training	GRM training for CLOs, focal points, and PIU staff	**500**
TOTAL		**5,000**

*The GRM operational cost over the construction lifecycle is budgeted at **$5,000 USD**, which is included in the overall ESMP budget (Section 7.10).*

9.11.4 Contact List

S/N	NAME	POSITION	PHONE NO
1	Gboweh Gabriel	Youth Leader	080644004847
2	Com. Aladeyetan David	Youth Leader	08031042420
3	Agbomenu Joseph	Youth Leader	08161311933
4	Buraimoh Waheed	Imam Apa	—
5	Mrs Agosun Adenike	Treasurer	07086745243
6	Mrs Agosun Hannah	Member	07086398153
7	Fabonugbo Daniel A	W H ~Liaison~	08083473227
8	Olorunnimbe Kafilat F.	Ajogbedo Community Sec.	0803392616
9	Henjinu Funmilayo	APA PHC Secretary	08130680371
10	Balogun Sadiq	Youth Leader	09116549394
11	Mihanwe Imole	NYCN Director	07044023889
12	Ajanglan Zeynab	Ward Health Committee	09074908016
13	Metome Oujau A.	W.H.C Chairman	07025490486

14	Sulamon Oluwaseun	Ward Health Council	08067445605
15	Zinsu Jacob	Youth Leader	07072930110
16	Aloluwade Mary	Chairperson	07045638291

9.12 Conclusion

The GBV/SEA/SH Action Plan provides a comprehensive, survivor-centred framework tailored to APA, Igbogbele, and Farasime, addressing the axis's documented Medium to Medium-High risk levels – including the distinctive trans-border labour dynamic at APA and the border-proximity reporting barrier at Igbogbele – through strong prevention, confidential reporting, trained personnel, and the structured eight-step referral pathway established in the Group 7 report itself.

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 of **$5,000 USD** is included in 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 findings of the ESIA for APA, Igbogbele, and Farasime PHCs 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 (OS1-OS5), 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 Group 7 Axis; separate standalone ESIA reports exist for the LSHIP's other axes.

10.2 Summary of Key Findings

Environmental and Social Context: the axis occupies the coastal lowland and riverine corridor along Badagry Creek; Igbogbele sits in a high-moisture, flood-prone zone with asbestos-suspected roofing; APA and Farasime carry aged infrastructure likely containing hazardous materials; GBV/SEA/SH risk is Medium-High at APA and Farasime, Medium at Igbogbele; climate risks include flooding (Igbogbele, Farasime) and coastal erosion/sea-level rise (APA).

Key Adverse Impacts (Unmitigated): Critical – asbestos exposure risk pending survey (all 3 sites); discharge risk to Badagry Creek; GBV/SEA/SH; flooding of construction areas. Major – trans-border labour influx (APA); OHS risks (all sites); water quality/erosion risks; fisheries/trading livelihood disruption. Moderate – dust, noise, construction waste, general traffic effects.

Key Positive Impacts: improved healthcare access for approximately 150,000 residents; reduced maternal and under-five mortality; local employment prioritising fishing and trading communities; solar power adoption reducing GHG emissions; strengthened pandemic resilience for remote riverine communities.

10.3 Summary of Mitigation Measures

ESMP (Chapter 7): air, creek water quality, waste, OHS, GRM, monitoring across all 3 sites. HMWMP (Chapter 8, Part A): WHO/AfDB colour coding, non-burn treatment, LAWMA disposal, zero discharge to Badagry Creek. Decommissioning Plan (Chapter 8, Part B): end-of-life framework with creek-margin restoration. GBV/SEA/SH Action Plan (Chapter 9): CoC, training, confidential reporting, the axis's own 8-step referral pathway. Asbestos Management Plan: survey at all 3 sites, licensed abatement if confirmed, air monitoring. Traffic Management Plan (Owode-Apa corridor, APA). OHS Plan: PPE, toolbox talks, medical surveillance.

10.4 Recommendations

Pre-Construction:

- Conduct asbestos surveys at all three sites (Igbogbele roofing flagged; APA and Farasime aged structures, with APA's own Table 9.4 confirming an unmitigated asbestos-abatement risk factor); implement licensed abatement if confirmed.
- Establish GBV referral pathways and MOUs (medical, psychosocial, legal, protection services per the axis's 8-step pathway); recruit the GBV Specialist; activate confidential reporting channels.
- Implement flood-resilient design (elevated platform at APA; oversized drainage; elevated electricals at Igbogbele and Farasime).
- Obtain all regulatory permits (LASEPA, LAWMA, building approvals).
- Finalise creek-margin and riverine buffer/sediment-control designs at APA and Farasime.
- Train contractors and PIU staff on AfDB ISS and ESMP implementation.

Construction Phase:

- Enforce the CESMP: dust control (priority at Igbogbele SP1), noise limits (priority at APA, Igbogbele SP2, Farasime SP3), erosion control, spill prevention.
- Implement the GBV Action Plan: CoC, training, reporting, sanctions – with particular attention to APA's trans-border labour dynamics.
- Ensure local-hiring targets are met to reduce labour-influx pressure at APA.
- Conduct environmental monitoring (air, noise, Badagry Creek water quality, waste).
- Maintain the GRM: 48-hour acknowledgement, 14-day resolution.
- Implement the Traffic Management Plan on the Owode-Apa corridor.
- Conduct quarterly IESM audits and implement corrective actions.

Operational Phase:

- Implement the HMWMP: segregation, non-burn treatment, LAWMA disposal – zero discharge to Badagry Creek.
- Apply WHO IPC standards: hand hygiene, sterilisation, PPE, cleaning.
- Maintain climate-resilient features: solar power, drainage, elevated-platform integrity at APA.
- Continue GBV prevention and response: staff training, confidential reporting.

- Maintain the GRM for patients and community members.
- Desludge septic tanks every 2–3 years.
- Prioritise solar power to reduce GHG emissions.

Institutional Strengthening:

- Strengthen PIU capacity with dedicated Environmental and Social Officers for the axis.
- Review the ESMP annually and update based on monitoring results.
- Ensure adequate ESMP budget allocation against the US$350,000 estimate.
- Maintain training programmes for contractors, facility operators, and communities, with attention to trans-border worker populations at APA.

10.5 Overall Conclusion

The ESIA concludes that APA, Igbogbele, and Farasime 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 by FMEnv, AfDB, and Lagos State authorities, subject to full ESMP implementation before commissioning, a functioning GRM and GBV referral pathway, and completed RAP compensation prior to construction start.

10.6 Final Statement

The Lagos State Health Infrastructure Project (LSHIP) Badagry Axis will significantly improve public health outcomes, strengthen health system resilience, and enhance environmental sustainability along the Badagry Creek corridor. With robust mitigation measures, strong institutional oversight, and continuous community engagement – including specific attention to the axis's trans-border labour context and creek-dependent livelihoods – 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

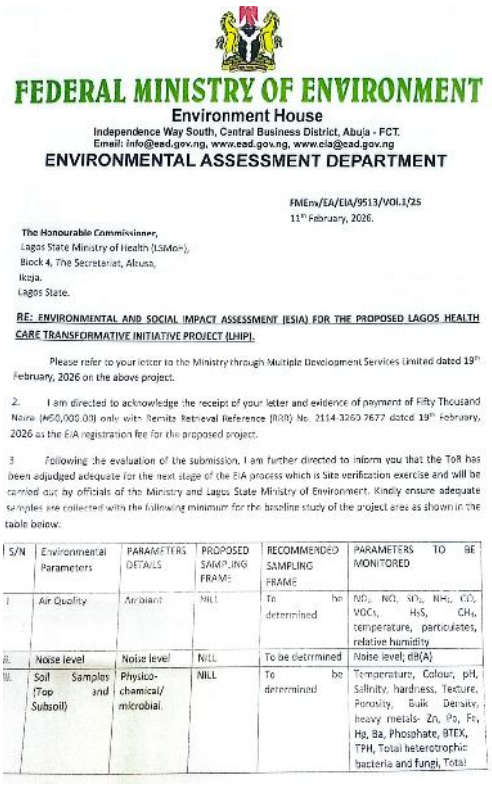
- ☑

Climate vulnerability

- ☑

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.
Email: info@ead.gov.ng, www.ead.gov.ng, www.eia@ead.gov.ng
ENVIRONMENTAL ASSESSMENT DEPARTMENT

FMEnv/EA/EIA/9513/VOL.1/25
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 Development Services Limited dated 19th February, 2026 on the above project.

2. I am directed to acknowledge the receipt of your letter and evidence of payment of Fifty Thousand Naira (₦50,000.00) only with Remita Retrieval Reference (RRR) No. 2114 3260 7677 dated 19th February, 2026 as the EIA registration fee for the proposed project.

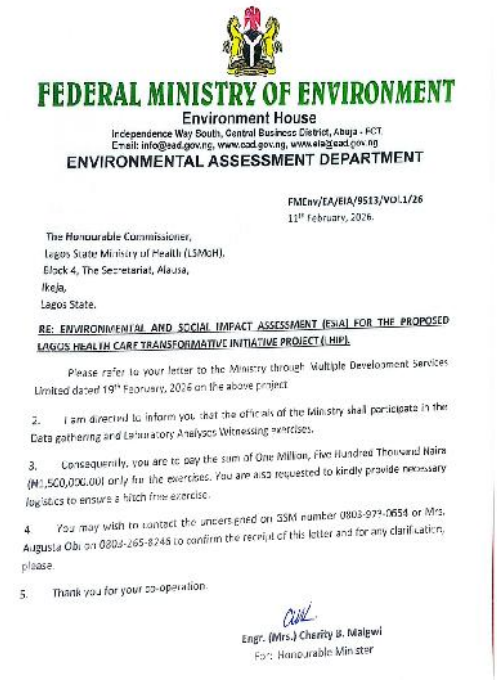
3 Following the evaluation of the submission, I am further directed to inform you that the ToR has been adjudged adequate for the next stage of the EIA process which is Site verification exercise and will be carried out by officials of the Ministry and Lagos State Ministry of Environment. Kindly ensure adequate samples are collected with the following minimum for the baseline study of the project area as shown in the table below:

S/N	Environmental Parameters	PARAMETERS DETAILS	PROPOSED SAMPLING FRAME	RECOMMENDED SAMPLING FRAME	PARAMETERS TO BE MONITORED
i.	Air Quality	Ambient	NILL	To be determined	NO_2, NO, SO_2, NH_3, CO, VOCs, H_2S, CH_4, temperature, particulates, relative humidity
ii.	Noise level	Noise level	NILL	To be determined	Noise level; dB(A)
iii.	Soil Samples (Top and Subsoil)	Physico-chamical/ microbial.	NILL	To be determined	Temperature, Colour, pH, Salinity, hardness, Texture, Porosity, Bulk Density, heavy metals- Zn, Pb, Fe, Hg, Ba, Phosphate, BTEX, TPH, Total heterotrophic bacteria and fungi, Total hydrocarbon utilizing bacteria and fungi, Total coliform, grain size distribution etc.
iv.	Surface Waste/Sediment	Physico-chemical /microbial.	NILL	To be determined	Water depth/width/flow rate direction/sediment transport, river bank erosion. Temperature, Colour, pH, Turbidity, Salinity, hardness, heavy metals- Zn, Pb, Fe, Hg, Ba etc. DO, BOD, COD, THC, Electrical conductivity, Phosphate, SO_4, NO_3, TSS, TDS, BTEX, TPH, grain size distribution etc
v.	Ground Water	Physico chemical microbial.	NILL	To be determined	Temperature, Colour, pH, Turbidity, Salinity, hardness, heavy metals- Zn, Pb, Fe, Hg, Ba etc. DO, BOD, COD, THC, Electrical conductivity, Phosphate, SO_4, NO_3, TSS, TDS, BTEX, TPH, grain size distribution etc.
vi.	Climate/Meteorology				Rainfall pattern, Relative humidity and Temperature, Wind speed, direction and visibility and their local effects
vii.	Socio-Economic/ Health Characteristics	Project area/adjacent community (ies)		Demography, social structure and organization, livelihood, social infrastructure, cultural properties, natural resources and land use, perception of the project, educational status, social vices and health impacts assessment indicators.	

4. Consequently, you are to pay the sum of One Million, Three Hundred and Twenty-Eight Thousand, Seven Hundred and Fifty Naira (₦1,328,750.00) only for the exercise. You are also requested to kindly provide necessary logistics and Technical personnel on site to ensure a hitch free exercise.

5. Please note that this letter supersedes the initial letter ref: FMEnv/EA/EIA/9513/VOL.1/25 and dated 4th February, 2026. You may wish to contact the undersigned on GSM number 0803-973-0654 or Mrs. Augusta Obi on 0803-265-8248 to confirm the receipt of this letter and for any clarification, please.

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, www.eia@ead.gov.ng
ENVIRONMENTAL ASSESSMENT DEPARTMENT

FMEnv/EA/EIA/9513/VOL.1/26
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 Development Services Limited dated 19th February, 2026 on the above project.

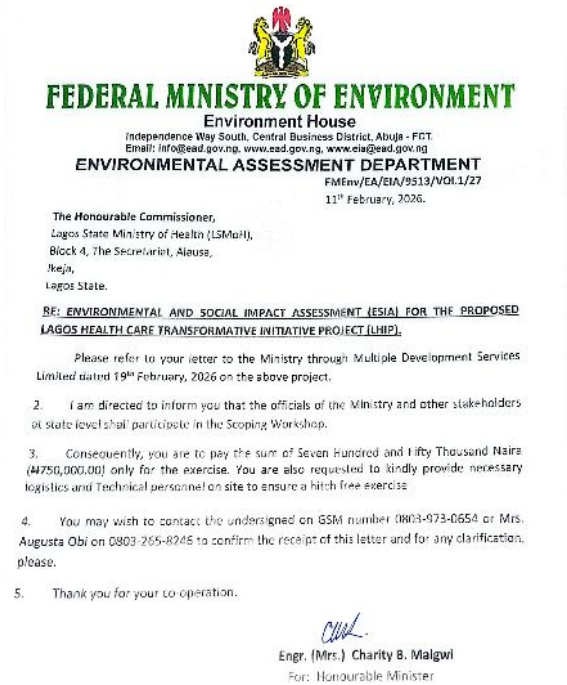
2. I am directed to inform you that the officials of the Ministry shall participate in the Data gathering and Laboratory Analyses Witnessing exercises.

3. Consequently, you are to pay the sum of One Million, Five Hundred Thousand Naira (₦1,500,000.00) only for the exercises. 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 0803-973-0654 or Mrs. Augusta Obi on 0803-265-8248 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, www.eia@ead.gov.ng
ENVIRONMENTAL ASSESSMENT DEPARTMENT

FMEnv/EA/EIA/9513/VOL.1/27
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 Development Services Limited dated 19th February, 2026 on the above project.

2. I am directed to inform you that the officials of the Ministry and other stakeholders 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 on site to ensure a hitch free exercise.

4. You may wish to contact the undersigned on GSM number 0803-973-0654 or Mrs. Augusta Obi on 0803-265-8248 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: 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 2	

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	
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	
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: 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.

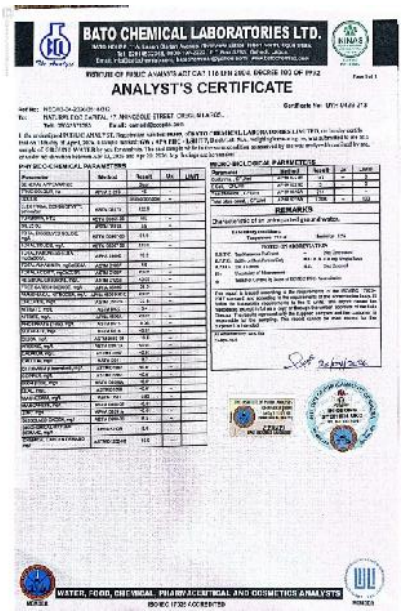
Date of Issue: 26TH JANUARY, 2022 Expiry Date: 25TH JANUARY, 2027

Seal of the Federal Ministry of Environment

FMENV shall not be liable to any claim(s) under this permit

Permanent Secretary

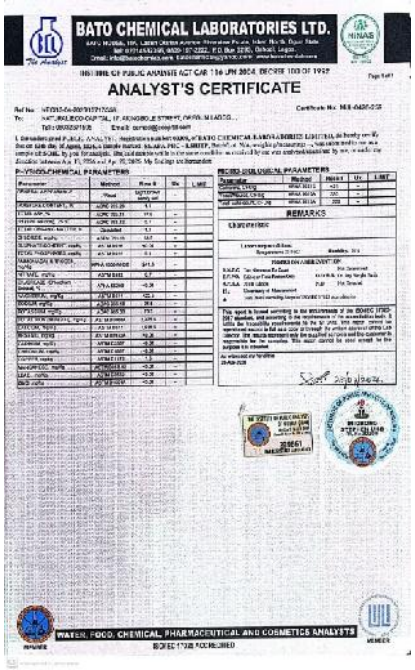
Apa PHC



BATO CHEMICAL LABORATORIES LTD.

ANALYST'S CERTIFICATE

WATER, FOOD, CHEMICAL, PHARMACEUTICAL AND COSMETICS ANALYSTS

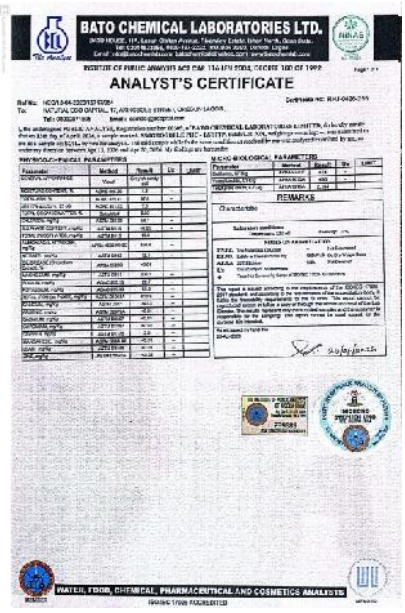


BATO CHEMICAL LABORATORIES LTD.

ANALYST'S CERTIFICATE

WATER, FOOD, CHEMICAL, PHARMACEUTICAL AND COSMETICS ANALYSTS

Igbogbele
PHC

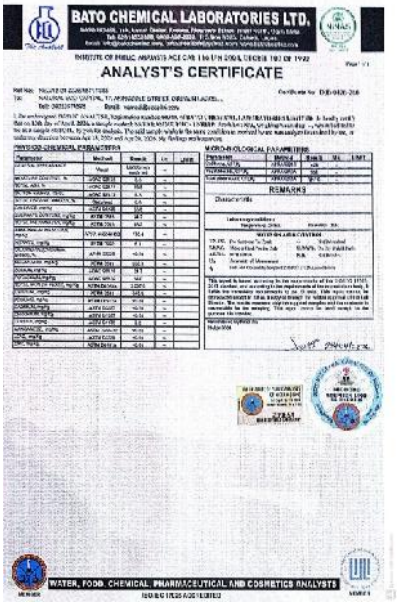

BATO CHEMICAL LABORATORIES LTD.

ANALYST'S CERTIFICATE

REMARKS

WATER, FOOD, CHEMICAL, PHARMACEUTICAL AND COSMETICS ANALYSTS

Farasime
PHC


BATO CHEMICAL LABORATORIES LTD.

ANALYST'S CERTIFICATE

REMARKS

WATER, FOOD, CHEMICAL, PHARMACEUTICAL AND COSMETICS ANALYSTS

Appendix 4.1: 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 5: Summary of Baseline Laboratory Results

GROUNDWATER QUALITY RESULT

Parameter	APA PHC SP1	APA PHC SP3	Igbogbele PHC SP1	Igbogbele PHC SP2	Farasime PHC SP1	Farasime PHC SP2	Regulatory Limit (WHO/NESREA/FMEnv/IFC)
Coordinates	6.430864, 2.823958	6.431943, 2.824163	6.423141, 2.779165	6.423600, 2.777820	6.425841, 2.714320	6.426300, 2.714230	—
Appearance	Clear	Clear	Clear	Clear	Clear	Clear	Clear
True Colour (Hz)	<5	<5	<5	<5	<5	<5	<15
Odour	Unobjectiona ble	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
EC (µS/cm)	122.6	587.0	587.0	161.4	161.4	161.4	1000
Turbidity (NTU)	NIL	NIL	NIL	NIL	NIL	NIL	5
pH	5.9	7.1	7.1	6.0	6.0	6.0	6.5–8.5
TDS (mg/L)	91.9	440.2	440.2	121.0	121.0	121.0	500
Total Solids (mg/L)	110.0	460.2	460.2	138.9	138.9	138.9	500
Total	13.2	85.6	85.6	19.1	19.1	19.1	200

Hardness (mg/L)							
Total Alkalinity (mg/L)	4.6	45.7	45.7	9.1	9.1	9.1	200
Total Acidity	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	—
Residual Chlorine	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.2–0.5
Free CO_2	28.0	16.9	16.9	25.0	25.0	25.0	—
Chloride (mg/L)	22.9	94.7	94.7	15.0	15.0	15.0	250
Nitrate (mg/L)	3.4	1.7	1.7	6.6	6.6	6.6	50
Sulphate (mg/L)	<0.01	37.4	37.4	<0.01	<0.01	<0.01	250
Heavy Metals	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	WHO Limits
DO (mg/L)	6.5	6.7	6.7	6.6	6.6	6.6	≥5
BOD (mg/L)	9.0	5.0	5.0	7.0	7.0	7.0	≤6
COD (mg/L)	16.0	12.0	12.0	12.0	12.0	12.0	≤10
Total Coliform (CFU/ml)	147	131	131	53	53	53	0

E. coli (CFU/ml)	3	0	0	0	0	0	0
Yeast/Mould	714	80	80	1,163	1,163	1,163	—
Total Plate Count	1,298	336	336	1,495	1,495	1,495	≤100

SOIL QUALITY RESULT

Parameter	APA SP1	APA SP2	APA SP3	Igbogbele SP1	Igbogbele SP2	Igbogbele SP3	Farasi me SP1	Farasi me SP2	Farasi me SP3	Regulatory (WHO/NESREA/F /IFC)
Coordinates	6.430864, 2.823958	6.431583, 2.824027	6.431943, 2.824163	6.423141, 2.779165	6.422865, 2.779983	6.423600, 2.777820	6.425841, 2.714320	6.425684, 2.714354	6.426300, 2.714230	—
Appearance	Light brown sandy	Light brown sandy	Light brown sandy	Greyish sandy	Greyish sandy	Greyish sandy	Light brown sandy	Light brown sandy	Light brown sandy	—
Moisture Content (%)	1.1	1.0	1.2	1.3	1.2	1.4	3.6	3.4	3.8	—

Total Ash (%)	97.8	97.0	98.2	97.8	97.0	98.0	89.8	89.0	90.5	—
pH	5.7	5.6	5.8	7.5	7.4	7.6	6.5	6.4	6.6	6.0 – 8.5
Total Organic Matter (%)	1.1	1.0	1.2	0.93	0.90	0.95	6.6	6.4	6.8	—
Chloride (mg/kg)	63.5	62.0	65.0	58.1	57.0	59.0	55.6	54.5	56.5	250
Sulphate (mg/kg)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	94.7	92.0	96.0	1000
Phosphate (mg/kg)	9.1	8.8	9.5	18.9	18.0	19.5	48.3	47.0	49.5	—
Ammoniacal N (mg/kg)	241.3	235.0	248.0	356.4	350.0	362.0	173.4	170.0	178.0	—
Nitrate (mg/kg)	6.7	6.5	7.0	12.1	11.8	12.5	6.1	5.9	6.4	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)	422.5	415.0	430.0	206.3	200.0	210.0	208.3	205.0	212.0	—
Sodium (mg/kg)	24.8	24.0	25.5	22.7	22.0	23.5	21.7	21.0	22.5	200
Potassium (mg/kg)	70.3	69.0	71.5	68.9	67.5	70.0	66.0	65.0	67.5	—
Total Iron (mg/kg)	2,275.5	2,200.0	2,350.0	806.9	790.0	830.0	2,287.6	2,250.0	2,320.0	50,000
Calcium (mg/kg)	1,916.5	1,880.0	1,950.0	340.3	330.0	350.0	343.6	335.0	355.0	—
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)	1.5	1.4	1.6	3.0	2.9	3.1	2.2	2.1	2.3	100
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)	<25	<23	<27	<24	<23	<26	<24	<23	<26	0
Yeast/Mould	380	370	390	490	480	500	551	540	565	—

(CFU/g)										
Total Plate Count (CFU/g)	1,220	1,200	1,250	2,104	2,050	2,150	TNTC (~>3000)	TNTC (~>3000)	TNTC (~>3000)	≤1000

Summary of Badagry Creek (Surface) Water Quality (Literature-Based Baseline)

Parameter	Typical Values Reported	Regulatory Benchmark (FMEnv/WHO)	Interpretation / ESIA Assessment
pH	6.5 – 7.4	6.5 – 8.5	Within acceptable range; slightly acidic in some zones
Dissolved Oxygen (DO)	2.1 – 5.8 mg/L	≥ 5 mg/L	Often below ecological threshold; indicates organic pollution and oxygen stress
Biochemical Oxygen Demand (BOD)	4.2 – 12.5 mg/L	≤ 5 mg/L	Elevated; suggests high organic load from domestic and fishing settlement waste
Chemical Oxygen Demand (COD)	10 – 40 mg/L	≤ 20 mg/L (typical surface water guideline)	Frequently elevated; presence of oxidizable pollutants

Total Coliforms	$1.2 \times 10^4 – 3.5 \times 10^5$ CFU/100 ml	0 CFU/100 ml (drinking water)	Very high; indicates fecal contamination and unsafe for direct human contact
E. coli	Frequently detected	0 CFU/100 ml	Confirms contamination from human/animal waste sources
Lead (Pb)	0.02 – 0.15 mg/L	0.01 mg/L	Often above limits; localized heavy-metal contamination
Cadmium (Cd)	0.001 – 0.01 mg/L	0.003 mg/L	Sometimes elevated; potential long-term ecological risk
Iron (Fe)	0.3 – 1.2 mg/L	0.3 mg/L	Frequently above limits; likely from sediment disturbance and runoff
Zinc (Zn)	0.05 – 0.25 mg/L	3.0 mg/L	Within acceptable range
Hydrocarbons (TPH)	Elevated in some zones	10 mg/L (sediment guideline)	Linked to boat traffic and oil-related activities
Turbidity	High during rainy season	≤ 5 NTU (drinking water)	High sediment load; influenced by tidal action and runoff
Ecological Condition	Reduced fish diversity; mangrove stress	—	Ecosystem under pressure; sensitive receptor requiring monitoring
Flooding / Hydrology	Seasonal tidal flooding; swampy terrain	—	High vulnerability; supports classification as critical receptor

Appendix 6 Asbestos Management Plan (AMP)

1.0 Introduction

Asbestos-Containing Materials (ACMs) were identified or suspected in roofing sheets, ceiling boards, and insulation materials at **Igbogbele PHC**, **Farasimi PHC**, and **Apa PHC**, with potential presence in older ancillary structures across the Group 7 Badagry axis locations. 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 across all Group 7 facilities.

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) residing within the host communities.
- 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, and 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 8.X).

3.2 Suspected ACM Locations (Group 7 Axis: Igbogbele, Farasimi, and Apa)

- **Igbogbele PHC:** Old roofing sheets, ceiling boards, and weather-damaged insulation materials.
- **Farasimi PHC:** Aging ceiling boards and weathered ancillary storage structures.

- **Apa PHC:** Older roofing elements and potential ACM-containing partitions (precautionary screening required prior to civil works).

4.0 Asbestos Removal Procedures

4.1 Contractor Requirements

Only FMEnv-licensed asbestos abatement contractors may perform removal. The contractor must submit:

- Asbestos Removal Plan (ARP) tailored to the Group 7 sites
- Worker training certificates
- PPE inventory
- Waste transport permit issued by relevant regulatory bodies
- Emergency response plan

4.2 Site Preparation

- Establish a **20–50 m exclusion zone** around each work area.
- Install clear warning signage (**"DANGER: ASBESTOS – KEEP OUT"**).
- Erect temporary fencing and strictly restrict public access.
- Shut down HVAC systems to prevent fiber spread.
- Notify LASEPA and FMEnv **72 hours** before removal operations commence.

4.3 Removal Method (Wet Method – WHO Standard)

- Wet ACMs continuously with a surfactant solution.
- Remove sheets intact; strictly **no breaking, cutting, drilling, or sanding**.
- Use hand tools only; **no power tools**.
- Place ACMs into **6-mil thick double-bagged asbestos waste bags**.
- Seal bags securely with duct tape and label clearly: **"ASBESTOS WASTE – DO NOT OPEN"**.

4.4 Worker Protection

- **Mandatory PPE:** Full-face P3 respirators, disposable coveralls, nitrile gloves, heavy-duty rubber boots, and eye protection.
- **Mandatory Medical & Training Requirements:** Pre-employment medical screening, fit-testing for respirators, and certified asbestos safety training.

5.0 Transport & Disposal Procedures

5.1 Transport

- Utilize FMEnv-licensed hazardous waste transporters.
- Vehicles must feature sealed, secure compartments.
- Transport waste directly to approved disposal sites without unauthorized stops.

5.2 Disposal

Disposal must occur exclusively at:

- LAWMA-approved hazardous waste landfill
- FMEnv-licensed asbestos burial pit

Waste manifest requirements:

- Quantity of ACM removed
- Date and time of transport
- Disposal site signature and official stamp
- Complete chain-of-custody documentation

6.0 Air Monitoring & Clearance Testing

6.1 During Removal

- Continuous real-time air monitoring using PCM/TEM methods.
- **Acceptable limit:** ≤ 0.1fibers/ml (WHO standard).
- Mandate immediate work stoppage if fiber levels exceed the specified threshold.

6.2 Post-Removal Clearance

- Conduct final comprehensive air sampling.
- Perform rigorous visual inspection for residual dust or debris.
- Issue official **Asbestos Clearance Certificate** (Appendix 6).

7.0 Emergency Response Procedures

Emergency Scenarios

- Accidental breakage of ACM elements
- Bag rupture or seal failure during handling
- Unanticipated worker exposure
- Unauthorized access to the established exclusion zone

Response Steps

1. Stop work immediately.
2. Evacuate all non-essential personnel from the zone.
3. Thoroughly wet any newly contaminated surfaces.
4. Double-bag and seal broken ACM fragments in new 6-mil bags.
5. Conduct emergency air monitoring to verify safety thresholds.
6. Report the incident to the PIU, LASEPA, and FMEnv **within 24 hours**.
7. Document corrective actions and preventive measures.

8.0 Community Protection Measures

- Conduct community sensitization campaigns with local stakeholders before removal begins.

- Provide GBV-sensitive communication tailored for women, children, and the elderly in Igbogbele, Farasimi, and Apa.
- Ensure school children and community residents are kept safely away from active work zones.
- Install heavy-duty dust screens and wind barriers around the perimeter.
- Maintain a **24-hour Community Liaison Officer (CLO) presence** during all removal phases.

9.0 Roles & Responsibilities

Entity	**Responsibility**
PIU (LSMoH)	Oversight, regulatory approvals, reporting to AfDB/FMEnv
Contractor	Safe removal execution, PPE compliance, waste transport, and documentation
Licensed Asbestos Assessor	Pre-removal survey, material sampling, air monitoring, and clearance testing
LASEPA	Compliance verification and environmental safety monitoring
FMEnv	Regulatory approval and hazardous waste oversight
CLO	Community communication, awareness, and grievance redress handling
IESM	Independent environmental monitoring and verification

10.0 Monitoring & Reporting

Monitoring Indicators

- Number of ACM samples collected and analyzed
- Air quality readings (fibers/ml)
- Number of workers trained and medically cleared
- Total quantity of ACM safely removed and disposed of
- Number of recorded incidents (if any) and corrective actions taken
- Clearance certificates issued

Reporting Frequency

- Daily contractor progress reports
- Weekly PIU status updates
- Monthly compliance reports submitted to AfDB
- Final Asbestos Removal Completion Report

11.0 Budget Estimate (Indicative — Group 7: Igbogbele, Farasimi, Apa Axis)

Item	**Cost (NGN)**
Asbestos Survey & Testing	2,500,000
Removal Contractor (Group 7 Sites)	6,000,000

PPE & Consumables	1,200,000
Air Monitoring	1,000,000
Transport & Disposal	1,500,000
Community Sensitization	300,000
Total	12,500,000

This Asbestos Management Plan satisfies all FMEnv, LASEPA, and AfDB ISS (2024) requirements and is ready for insertion into Chapter 8 of the ESIA.

Appendix 7 -- Stakeholder Engagement Evidence Package

This Appendix provides full evidence of stakeholder engagement conducted between 24 February and 10 April 2026 across the four PHC sites. It includes:

- Attendance sheets (scanned copies)
- Contact lists
- Signatures
- Photographs (Plates)
- Concerns matrix with project responses
- Field sampling logs
- Laboratory certificates
- Site photographs (Plates 3.2–3.5)
- Statement of completeness

All evidence complies with FMEnv ESIA Act (1992), AfDB ISS (2024), and LASEPA requirements for free, prior, informed, and documented consultation.

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 project (Design/Operation)	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.
	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)

Rep. Of Minister, FMEnv

Name/Sign/Date

Tel. No.



Dr. Ayodotun Bobadoye

Special Asst. To Commissioner for Health

Name/Sign/Date

Tel. No.



Chidiebere Emmanuel

Head, MDS Team

Name/Sign/Date

Tel. No.

Appendix 7.1: Pictures of the Engagement











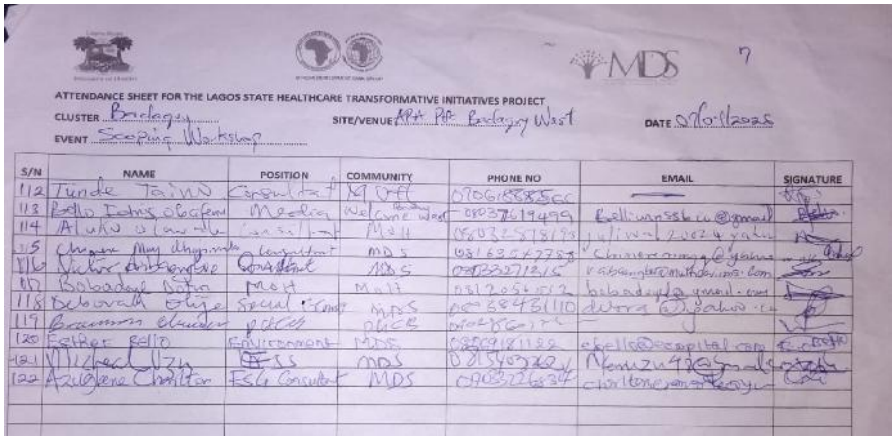








Appendix 7.2: Attendance Sheet



MDS 7

ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West DATE 07/07/2025

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO	EMAIL	SIGNATURE
112	Tunde Taiwo	Consultant	MJ Off	07061885566	—	
113	Bello Isiaq Olajide	Media	Welcome Wood	08037619499	bellowasaka@gmail	
114	Aluko Olawale	Consultant	MJ II	08032578179	julival2024yahoo	
115	Chinwe Mary Anyanwu	Consultant	MDS	08163647783	Chinwemary@yahoo	
116	Victor Anthonia	Consultant	MDS	07033271215	victoranthonia@yahoo.com	
117	Bolaodagba Bolaji	Media	Mushin	08126561613	bolaodagba@gmail.com	
118	Deborah Olaje	Social Comm	MDS	08188431110	deborah@yahoo.com	
119	Brannon Elucidation	Public	Ojuelegba	08056	—	
120	Esther Bello	Environment	MDS	08059181188	ebello@escapital.com	
121	Michael Uzh	ESS	MDS	08154603649	Nonuzu42@gmail.com	
122	Azuogene Charlton	ESG Consultant	MDS	08032268347	charltone@yahoo.com	



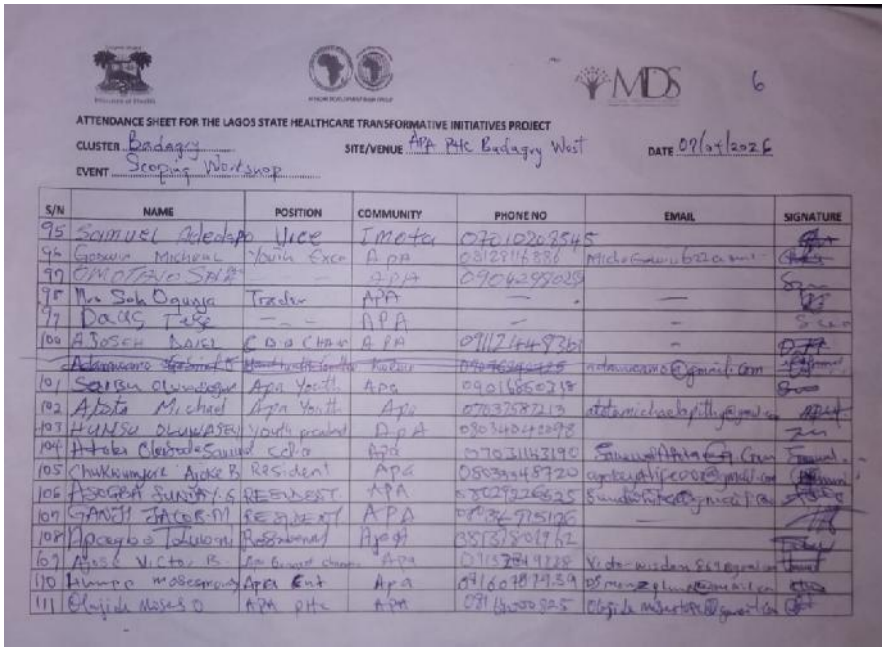
MDS 7

ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West DATE 07/07/2025

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO	EMAIL	SIGNATURE
112	Tunde Taiwo	Consultant	MJ Off	07061885566	—	
113	Bello Isiaq Olajide	Media	Welcome Wood	08037619499	bellowasaka@gmail	
114	Aluko Olawale	Consultant	MJ II	08032578179	julival2024yahoo	
115	Chinwe Mary Anyanwu	Consultant	MDS	08163647783	Chinwemary@yahoo	
116	Victor Anthonia	Consultant	MDS	07033271215	victoranthonia@yahoo.com	
117	Bolaodagba Bolaji	Media	Mushin	08126561613	bolaodagba@gmail.com	
118	Deborah Olaje	Social Comm	MDS	08188431110	deborah@yahoo.com	
119	Brannon Elucidation	Public	Ojuelegba	08056	—	
120	Esther Bello	Environment	MDS	08059181188	ebello@escapital.com	
121	Michael Uzh	ESS	MDS	08154603649	Nonuzu42@gmail.com	
122	Azuogene Charlton	ESG Consultant	MDS	08032268347	charltone@yahoo.com	



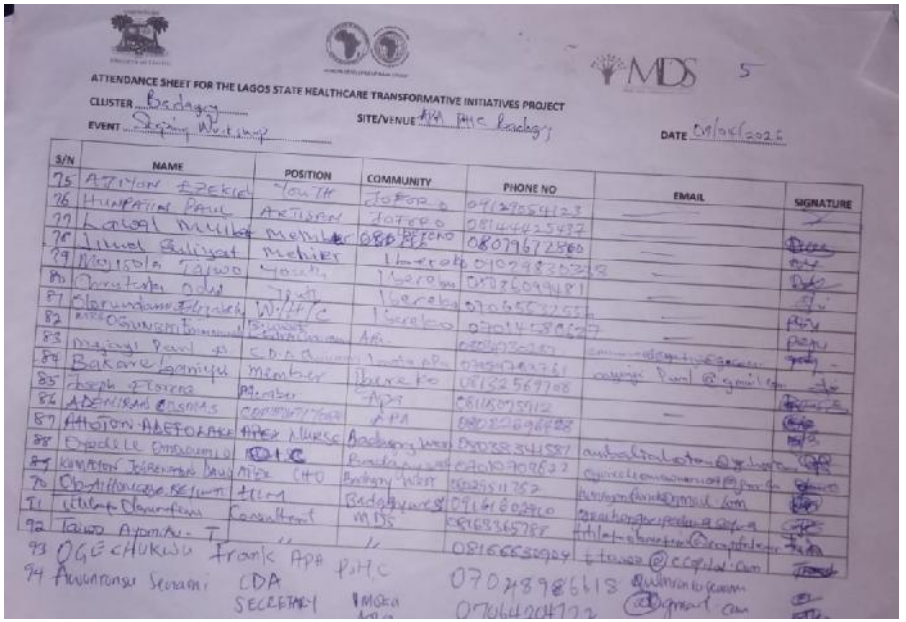
MDS 6

ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West DATE 09/07/2025

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO	EMAIL	SIGNATURE
95	Samuel Wedapo	Vice	Imeta	07010202545		
96	Goswin Michael	Youth Exco	APA	08128114880	Michaelgoswin622@gmail	
97	CHIOTAVO SAMUEL	—	APA	09062995059	—	
98	Mr Sob Ogunja	Trader	APA	—	—	
99	Dada Tope	—	APA	—	—	
100	AJOSEH DAISI	CDA CHAIR	APA	09112144876	—	
~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~
101	Sarbu Olawoyin	Apa Youth	APA	09016850218		
102	Afota Michael	Apa Youth	Apa	07037587213	afotamichaelpitt@yahoo	
103	HUNSU OLUWASEUN	Youth prasid	DpA	08034042098		
104	Hfoka Clestade Samuel	cdla	Apa	07031143190	Samuelfiakaa@gmail.com	
105	Chukwumeke Ajoke B	Resident	APA	08039348720	agbajaffic@gmail.com	
106	ASOGBA SUNDAY S	RESIDENT	APA	07029226625	Sundayasogba@yahoo.com	
107	GANIU JACOB M	RESIDENT	APA	08036705196	—	
108	Agbajoba Tolulope	Professional	Agege	08158501962		
109	Ajose Victor B.	Ex Council chair	Apa	07037849228	Victorajose56@gmail.com	
110	Hunpe Moses Olajide	Apex Ent	Apa	07160387959	Olajidemoses@gmail.com	
111	Olajide Moses O	APA PHC	APA	09[illegible]325	Olajidemoses@gmail.com	



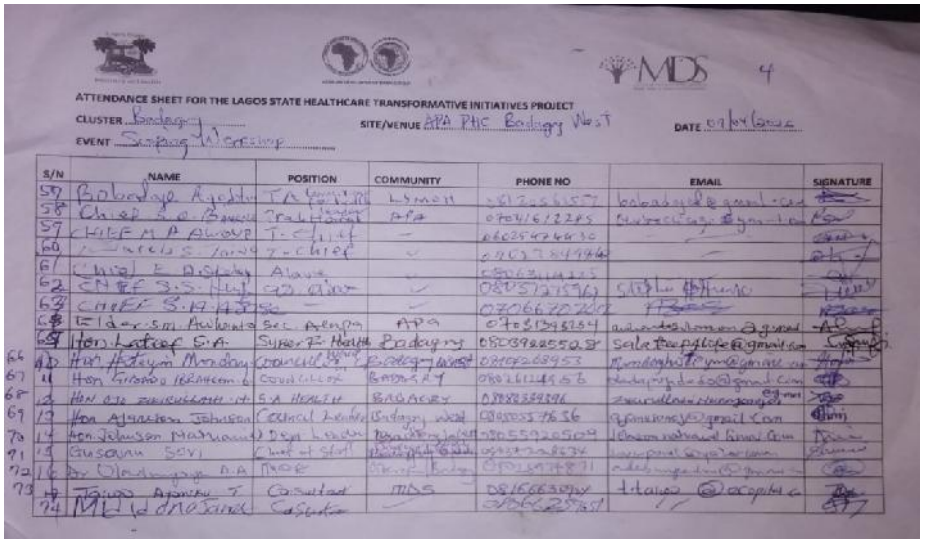
MDS 5

ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry DATE 04/06/2025

EVENT Scoping Workshop

S/N	NAME	POSITION	COMMUNITY	PHONE NO	EMAIL	SIGNATURE
75	ATITOM EZEKIEL	YOUTH	Jafara	07032854423	—	
76	HUNPATIN PAUL	ARTISAN	Jafara	08144425497	—	
77	LAOSOL MUIBA	Member	OBA PALACE	08079672560	—	
78	Jimoh Sulaiyat	Member	Ilaro	08079672560	—	
79	Mojisola Tajwo	Youth	Ilaro	07029836748	—	
80	Christian Odeh	Youth	Ilaro	07076094481	—	
81	Olaruntoba Olaniyi	WHC	Ilaro	07065[illegible]	—	
82	[illegible]	[illegible]	[illegible]	[illegible]	—	
83	[illegible]	[illegible]	APA	[illegible]	—	
84	Bakare Jamiu	Member	Ilaro	07037[illegible]	[illegible]	
85	Joseph Flores	Member	Apa	08152567108	[illegible]	
86	ADENIRAN [illegible]	[illegible]	APA	08114095912	—	
87	ATITOM ABEOKAKE	APHC Nurse	APA	08035344587	[illegible]	
88	Oyedele [illegible]	PHC	Badagry West	08035344587	[illegible]	
89	KUMATOM [illegible]	Area CHO	Badagry West	08037909623	[illegible]	
90	[illegible]	[illegible]	Badagry West	08029511762	[illegible]	
91	[illegible]	[illegible]	Badagry West	07016802240	[illegible]	
92	Taiwo Ajomale T	Consultant	MDS	08169365782	[illegible]	
93	OGECHUKWU Frank	APA PHC	"	08166650924	[illegible]	
94	Awuramsa Serami	CDA SECRETARY	Moba	07074898618	[illegible]	
				07064204722	[illegible]	



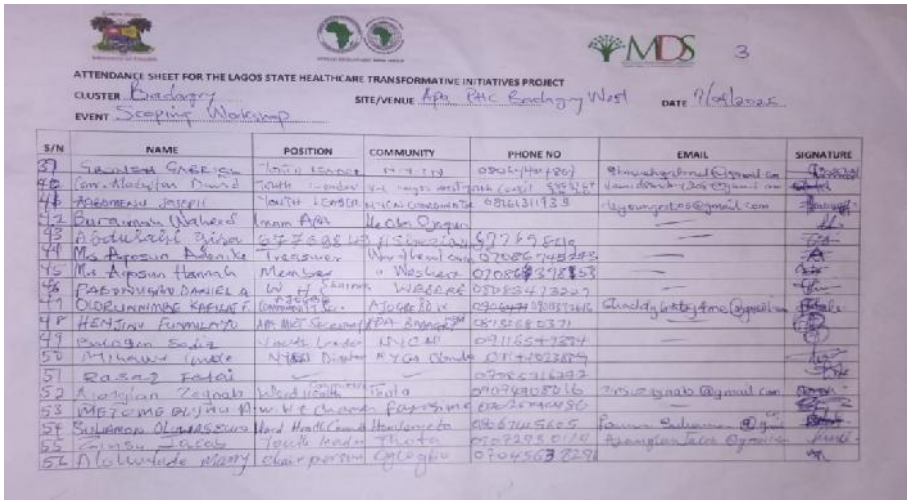
ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West DATE 07/04/2026

EVENT Scoping Workshop

MDS 4

S/N	NAME	POSITION	COMMUNITY	PHONE NO	EMAIL	SIGNATURE
57	Bolaraye Ayodele	TA Health	Lymoth	08120651577	bolaraye1@gmail.com	
58	Chief Sir Banjo	Traditional	APA	07041612285	[illegible]	
59	CHIEF M.A ALAOYE	T.C	—	08025476630	—	
60	[illegible]	[illegible]	—	09037844946	—	
61	CHIEF E.Dosekun	Alaye	—	08068114225	—	
62	CHIEF S.S. Huf	CD. Olori	—	08057215761	[illegible]	
63	CHIEF S.A. [illegible]	—	—	07066720207	—	
64	Elder S.M. Ajibade	Sec. Agenda	APA	07051396254	[illegible]	
65	Hon. Lateef S.A.	Super 7 Health	Badagry	08039885528	[illegible]	
66	Hon. Adeyemi Monday	Councillor	Badagry West	07062268953	[illegible]	
67	Hon. Gbadamosi Ibraheem O.	Councillor	Badagry	08026124156	[illegible]	
68	HON. AJE ZAKARIYAU A.	S.A HEALTH	BADAGRY	07038339396	[illegible]	
69	Hon. Ajayeoba Johnson	Council Member	Badagry West	08035576536	[illegible]	
70	Hon. Johnson Mathias	Dep. Leader	Badagry	08055926509	[illegible]	
71	Gusanu Sovi	Chief of Staff	Badagry	09037326574	[illegible]	
72	Dr. Oladapo A.A	MOH	Badagry	07051497871	[illegible]	
73	Tajudeen Agunbiade T.	Consultant	MDS	08166639144	[illegible]	
74	MLW Dno Zone	Cascade	—	08062251851	—	



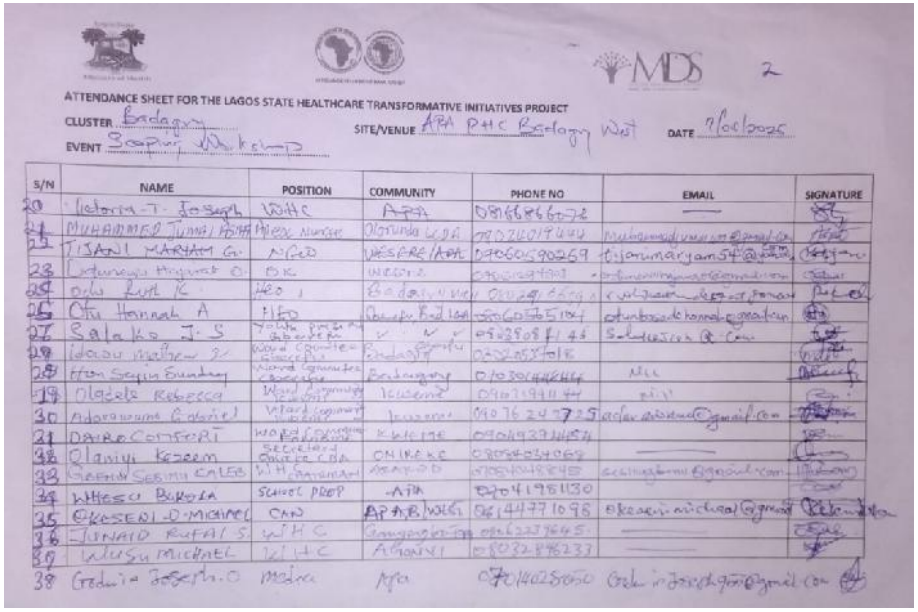
ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West DATE 7/04/2026

EVENT Scoping Workshop

MDS 3

S/N	NAME	POSITION	COMMUNITY	PHONE NO	EMAIL	SIGNATURE
37	Sunusi Gbenga	Youth Leader	Ayetoro	0803[illegible]	[illegible]	
40	Com. Aladejan Nurud	Youth Leader	Ayetoro	0[illegible]	[illegible]	
41	Adebanjo Joseph	Youth Leader	African Community	08161311939	[illegible]	
42	Buraimoh Waheed	Comm APA	Ilogbo Ajegun	—	—	
43	Abdulkabir Bisiri	[illegible]	[illegible]	[illegible]	—	
44	Mrs Aposin Adenike	Treasurer	Wor-Ilewuli Ondo	07086745[illegible]	—	
45	Mrs Aposin Hannah	Member	Ilo Westbeach	07085[illegible]	—	
46	FADEYIGBA DANIELA	W.H Chairman	WIBEARI	08165473227	—	
47	OLORUNNIMBE RAFIAT F.	Community Rep.	Ajegunle IV	0906[illegible]	[illegible]	
48	HEMTINU FUNMILAYO	APA Asst Secretary	APA Badagry	08156680371	—	
49	Balogun Sodiq	Youth Leader	Ilogbo	09116549894	—	
50	Mathews Iyabo	Ward Chairman	Ayeyi Olorile	07134023879	—	
51	Rasaq Fatai	—	—	07065316397	—	
52	Ajayi Zainab	Village Head	Tiedo	09074980816	[illegible]	
53	WELCOME OLUWATOSIN	Ward Health Committee	Ilogbo	08067445865	[illegible]	
54	SULAIMON OLUWASEUN	Ward Health Committee	Ilogbo	08067445865	[illegible]	
55	Emmanuel Caleb	Youth Leader	Tiedo	09072985010	[illegible]	
56	Olawunmi Mary	Chairperson	Ajegunle	07045038291	—	



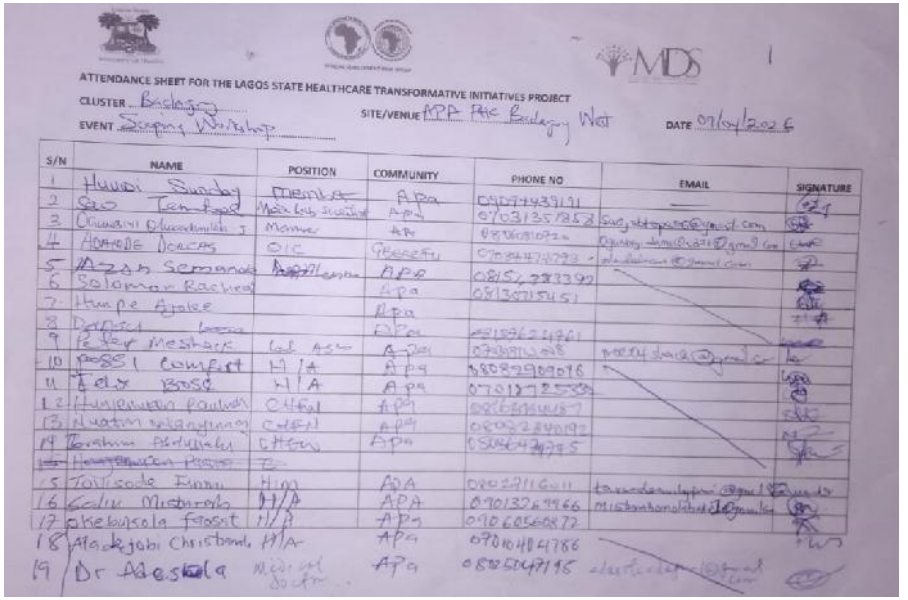
ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West DATE 7/04/2026

EVENT Scoping Workshop

MDS 2

S/N	NAME	POSITION	COMMUNITY	PHONE NO	EMAIL	SIGNATURE
20	Victoria T. Joseph	WIHC	APA	08166866678	—	
21	MUHAMMED JUMAI HAWA	MCH Nurse	Olotunda LGA	09076019484	[illegible]	
22	TIJANI MARIAM G.	NCEO	WESBARI/APA	07060590259	tijanimariyam54@gmail.com	
23	Letunuyo Ayomide O.	OIC	WECOZ	07061694903	[illegible]	
24	Onu Ruth K.	HEO 1	Badagry LGA	08139[illegible]	[illegible]	
25	Otu Hannah A.	HEO	Badagry Ward	08056015104	[illegible]	
27	Salako J.S.	Youth Leader	[illegible]	08028081148	[illegible]	
28	Idowu Mathew	Ward Councilor	Badagry	08038[illegible]	—	
29	Hon. Segun Sunday	Ward Councilor	Badagry	07030[illegible]	NIL	
30	Olajede Rebecca	Ward Secretary	Igbosere	09071941144	nil	
31	Adaramaine Gabriel	Ward Secretary	Igbosere	0907624772[illegible]	[illegible]	
32	DAIRO COMFORT	WDC/Secretary	KWICHE	09061937[illegible]	—	
33	Olaniyi Kazeem	Secretary	ONIKEKE	08054834065	—	
34	Ogunsina Sesimi Caleb	W.H Assistant	Akarigbo	07054048845	[illegible]	
35	WHESCO BUKOLA	SCHOOL PREP	ATA	07041961130	—	
36	OKESENI D. MICHAEL	CAN	APA/B/WLGA	08144771098	[illegible]	
37	JUNAID RUFAI S.	WHC	Congregation	08163237645	—	
38	LUKUSU MICHAEL	WHC	AGANYI	08028786233	—	
39	Gbolaria Joseph O.	Mainu	Apa	07061402850	[illegible]	



ATTENDANCE SHEET FOR THE LAGOS STATE HEALTHCARE TRANSFORMATIVE INITIATIVES PROJECT

CLUSTER Badagry SITE/VENUE APA PHC Badagry West DATE 07/04/2026

EVENT Scoping Workshop

MDS 1

S/N	NAME	POSITION	COMMUNITY	PHONE NO	EMAIL	SIGNATURE
1	Huwei Sunday	Member	Apa	08074439131	—	
2	Seo Temitope	Member	Apa	07031357858	[illegible]	
3	Oluwaseni Oluwakemisola J.	Member	Apa	08[illegible]	[illegible]	
4	Adeoye Joseph	OIC	Gbesebu	07084747[illegible]	[illegible]	
5	Azeh Semanda	Member	Apa	0815[illegible]	[illegible]	
6	Solomon Rachael	—	Apa	08136015451	—	
7	Hunpe Ajoke	—	Apa	—	—	
8	Daniel [illegible]	—	Apa	—	—	
9	Peter Meshack	Lab Asst	Apa	08158624761	—	
10	BOSSI Comfort	H/A	Apa	07068[illegible]	[illegible]	
11	Taiwo BOSSI	H/A	Apa	08089[illegible]	—	
12	Humpewon Paulina	Chief	Apa	07012[illegible]	—	
13	Nwatom Nkanginwa	Chief	Apa	08052[illegible]	—	
14	Ibrahim Abdulahi	Chief	Apa	08[illegible]	—	
15	Tomisode Funmi	Hon	APA	08022116[illegible]	[illegible]	
16	Collo Mistorolo	H/A	APA	07013[illegible]	[illegible]	
17	Akebiyesola Fasasit	H/A	APA	07066[illegible]	—	
18	Alaokejobi Christiana	H/A	APA	07041[illegible]	—	
19	Dr Akeseola	Medical Doctor	APA	08[illegible]	[illegible]	

Appendix 8: 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.

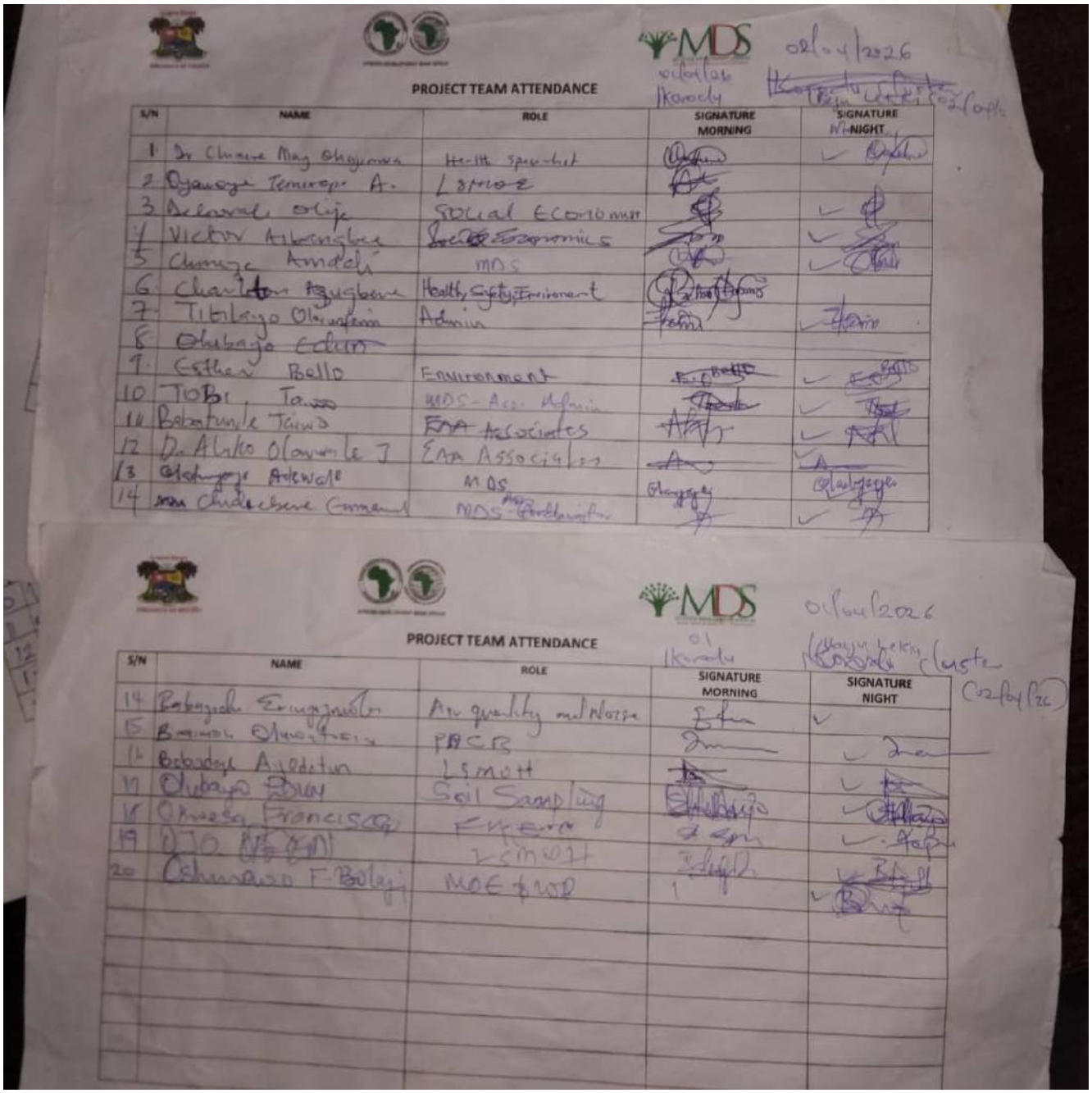
Position	Signature	Date

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	Dr Chinwe May Ohajunwa	Health specialist		
2	Ojaruega Temitope A.	Lawyer		
3	Adewale Olaja	Social Economist		
4	Victor Akhenglay	Economics		
5	Chinaza Amadi	MDS		
6	Charleton Agugbere	Health, Safety, Environment		
7	Titilayo Olawuyi	Admin		
8	Olubajo Edun			
9	Esther Bello	Environment		
10	TOBI, Ta...	MDS - Acc. Admin		
11	Babatunde Taiwo	EnA Associates		
12	Dr Alako Olawunmi J	EnA Associates		
13	Olubunmi Adewale	MDS		
14	Chidiebere Command	MDS - Facilitator		

PROJECT TEAM ATTENDANCE

S/N	NAME	ROLE	SIGNATURE MORNING	SIGNATURE NIGHT
14	Babajide Emmanuel	Air quality and Noise		
15	Bamidele Olawuyi	PRCB		
16	Babajide Aderotimi	LSMOH		
17	Olubajo Bolaji	Soil Sampling		
18	Okwesa Francis	Engineer		
19	DJO [illegible]	Chemist		
20	Oshunkeye F. Bolaji	MOE & NOP		

Appendix 9: Traffic Management Plan (TMP)

A. Purpose

This Traffic Management Plan (TMP) ensures the safe and orderly movement of vehicles, workers, and community members during the construction and refurbishment of the PHC facilities in the **Group 7 Badagry Axis (Igbogbele, Farasimi, and Apa)**.

B. Traffic Impact by Site

Site	Baseline Traffic (AADT)	Construction Traffic (Peak)	Risk Level
Igbogbele	500–1,000	10–20 vehicle trips/day	Medium-High
Farasimi	2,000–5,000	10–20 vehicle trips/day	Medium-High
Apa	<500	5–10 vehicle trips/day	Low-Medium

C. Mitigation Measures

1. Delivery Scheduling

- Deliver materials between **9:00 AM and 4:00 PM** (avoiding peak commuter hours: 7:00 AM – 9:00 AM and 5:00 PM – 7:00 PM).
- Schedule major concrete pours and heavy deliveries during low-traffic periods.
- Coordinate closely with local authorities regarding any temporary road restrictions or closures.

2. Signage and Communication

Install clear warning and directional signs **200m** before construction entrances.

Post prominent speed limit signs (**30 km/h zones**) surrounding all work sites.

Display construction schedule notices in prominent community locations.

Utilize variable message boards where feasible to alert motorists.

3. Traffic Control

- Deploy trained professional traffic marshals at all site entry and exit points.
- Use stop/go paddles or portable traffic control lights where single-lane operations are necessary.
- Maintain clear sightlines at all access points by eliminating visual obstructions.
- Provide safe, marked crossing points for pedestrians and school children.

4. Access Management

- Maintain unhindered access to all nearby residential homes and commercial businesses.

- Provide clear alternative routes and detour signage where roads must be temporarily narrowed or closed.
- Ensure emergency vehicle access is prioritized and maintained at all times.
- Install temporary footpaths or walkways where pedestrian pathways are disrupted.

5. Worker Transport
    - Provide designated, organized parking areas for worker vehicles off public thoroughfares.
    - Encourage carpooling and shuttle services to minimize vehicle footprint.
    - Strictly separate worker vehicle entry gates from heavy material delivery routes.
    - Enforce a **zero-parking policy** on surrounding public roads.
6. Emergency Access
    - Maintain unobstructed emergency corridors for ambulances and fire trucks.
    - Designate and clearly sign emergency access routes around each facility.
    - Provide up-to-date site layout maps to local emergency services.
    - Train all security and traffic personnel on emergency response and vehicle prioritization procedures.

D. Monitoring

Indicator	**Target**	**Frequency**	**Responsible Party**
Traffic incidents	Zero	Daily	Site Supervisor
Signage compliance	100%	Weekly	HSE Officer
Speed limit compliance	100%	Weekly	Security Lead
Community complaints	Resolved ≤ 14 days	Ongoing	CLO
Emergency access	Maintained clear	Daily	Site Supervisor

E. Contact List for Traffic Management

Role	**Name**	**Phone Number**
Site Traffic Marshal (Igbogbele)	[Name]	[Phone]

Role	Name	Phone Number
Site Traffic Marshal (Farasimi)	[Name]	[Phone]
Site Traffic Marshal (Apa)	[Name]	[Phone]
Badagry LGA Traffic Department	[Name]	[Phone]
LASEMA Emergency	—	112

Appendix 10: 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 8)

Appendix 11 – 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 approval before construction begins.	Contractor	FMEnv EIA Act Cap E12 LFN 2004
	Environmental Management Plan (EMP)	Submit a site-specific EMP for each PHC cluster or for all 29 centres, covering waste, dust, noise, water, and	Contractor	Contract Clause 2.2; FMEnv EA Guidelines

		spills. The EMP shall be reviewed in line with FMEnv's Environmental Assessment (EA) reporting 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,	Contractor	NESREA (Chemical Mgmt) Regulations

		including inventory of fuel/chemicals to be stored.		
	Training Plan	Submit an environmental induction training plan for all site personnel.	Contractor	Contract Clause 2.4
	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 levels to comply with	Contractor	LASEPA Noise Regulations; FMEnv Noise Standards

		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	Contractor / Employer	NESREA (Medical Waste) Regulations (FMEnv)

		waste contractor before refurbishment begins.		
	Community Safety	Fence deep excavations; lock hazardous material storage areas; maintain access to active PHC entrances.	Contractor	Contract Clause 4.3
	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	Employer	FMEnv Environmental Audit Guidelines

		conduct a post-construction Environmental Audit Report (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 regularly; located away from patient and community areas; exhaust directed upward. Emissions shall	Employer	LASEPA Air Quality Guidelines; FMEnv Air Quality Standards

		comply with FMEnv National 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-licensed contractor.	PHC Operator	NESREA (Pharmaceutical Waste) Regulations (FMEnv)
	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	Future Contractor / Employer	NESREA (Decommissioning) Regulations; FMEnv Guidelines

		plan shall be submitted to LASEPA and FMEnv (through NESREA) 60 days prior to works.		
	Hazardous Materials Inventory	Before demolition, survey for asbestos, lead paint, mercury (from old thermometers), and other hazardous materials.	Future Contractor	IFC EHS Guidelines; NESREA Regulations
	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	Future Contractor	NESREA (Hazardous Waste) Regulations

		through a NESREA-licensed hazardous waste 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: Risk Table for PHC construction and operations near water bodies

The proposed health facility is located in APA Community, Badagry West, a coastal rural settlement to Badagry Creek, a tidal brackish water system influenced by:

- Semi-diurnal tides
- Seasonal rainfall
- Swampy, low-lying terrain
- High groundwater table

These hydrological conditions create a sensitive environment, especially for essential public infrastructure like a PHC.

Hydrological Characteristics Relevant to a Health Facility:

Hydrological Feature	Description	Relevance to Health Facility
Tidal Fluctuations	Daily water level changes of 0.3–1.0 m	Potential for backflow into drainage systems.
Seasonal Flooding	Common during rainy season and high tides	Risk of facility flooding, access disruption, and service interruption.
High Groundwater Table	Groundwater often near surface	Excavation may encounter water; foundation design must consider uplift pressure.

Poor Drainage	Swampy terrain slows runoff	Standing water increases mosquito breeding and disease risk.
Shoreline Erosion	Soft sediments prone to erosion	Long-term stability concerns for facility perimeter.

Risk Table for PHC construction and operations near water body:

ID	Risk / Impact Description	Phase	Likelihood	Consequence	Risk Rating	Key Mitigation Measures
R1 / H3	Flooding of PHC building and compound due to creek overflow, heavy rainfall, and poor drainage	Construction & Operation	🔴 High	🔴 High	🔴 **High**	Elevated platform design; flood-resilient foundations; oversized perimeter drains; maintain clear drainage paths; regular inspection
R2	Access disruption for patients and ambulances due to flooded roads and walkways	Operation	🔴 High	🔴 High	🔴 **High**	Raise access roads/walkways; provide alternative elevated routes; regular drain maintenance; emergency access plan
R6 / H7	Backflow from creek into PHC drainage system during high tides/floods	Operation	🟠 Medium	🔴 High	🔴 **High**	Install non-return valves; raise discharge points; separate stormwater and wastewater systems; regular inspection
R7	Stagnant water around PHC leading to mosquito breeding and vector-borne diseases	Operation	🔴 High	🔴 High	🔴 **High**	Proper grading; covered drains; soakaways; routine clearing of standing water; integrated vector control
R9	Structural damage over time due to repeated flooding and high groundwater	Operation	🟠 Medium	🔴 High	🔴 **High**	Flood-resilient design; periodic structural inspections; reinforcement of critical elements; long-term maintenance plan
R10	Service interruption during extreme hydrological events	Operation	🟠 Medium	🔴 High	🔴 **High**	Emergency preparedness plan; backup power and supplies; alternative service arrangements; communication protocol with community
H2	Increased surface runoff and peak flows into Badagry Creek	Operation	🟠 Medium	🟠 Medium–High	🟠 **Medium–High**	Impervious surfaces (roofs, pavements) require attenuation; implement sustainable drainage systems (SuDS); retention basins

ID	Risk / Impact Description	Phase	Likelihood	Consequence	Risk Rating	Key Mitigation Measures
R4 / H4	Increased erosion of creek bank and shoreline instability near PHC	Construction & Operation	Medium	Medium–High	**Medium–High**	Maintain vegetated buffer; avoid direct stormwater discharge to bank; use bio-engineering or geotextile stabilisation
R8	Contamination of creek from PHC wastewater in case of system failure	Operation	Low–Medium	High	**Medium–High**	Robust, sealed wastewater system; regular maintenance; emergency response plan; no direct discharge to creek
R3	Groundwater intrusion during excavation and foundation works	Construction	Medium	Medium	**Medium**	Dewatering plan; waterproofing; use appropriate foundation type (raft/piles); schedule major excavation in dry season
R5 / H6	Sediment runoff from construction into Badagry Creek	Construction	Medium	Medium	**Medium**	Silt fences; sediment traps; staged earthworks; limit exposed soil; work during low rainfall periods
H1	Modification of natural drainage patterns around PHC site	Construction & Operation	Medium	Medium	**Medium**	Due to earthworks, platform elevation, and access road construction; restore natural flows where possible
H5	Groundwater–structure interaction (uplift, seepage)	Construction & Operation	Medium	Medium	**Medium**	High water table typical of coastal wetlands; design for buoyancy; include under-slab drainage
H8	Long-term change in micro-hydrology (ponding, wet spots)	Operation	Medium	Medium	**Medium**	Influences mosquito breeding and infrastructure performance; monitor and maintain drainage

Summary of Risk Ratings

Risk Level	Number of Risks	Risk IDs
High	6	R1, R2, R6, R7, R9, R10
Medium–High	3	H2, R4, R8

Risk Level	Number of Risks	Risk IDs
Medium	5	R3, R5, H1, H5, H8
TOTAL	**14**	

Risk Assessment for Construction and Operations Near Water Bodies

The Badagry Group 7 PHC facilities, particularly APA PHC which is directly adjacent to Badagry Creek, face significant hydrological and flood-related risks. A qualitative risk assessment considered the swampy terrain, coastal flooding history, and proximity to the creek.

Key Findings:

- Six (6) High-rated risks were identified, primarily related to flooding (R1, R2, R6), vector-borne diseases (R7), structural damage (R9), and service interruption (R10). These require immediate and strong mitigation.
- Three (3) Medium–High risks relate to increased runoff into Badagry Creek (H2), bank erosion (R4/H4), and creek contamination from wastewater failure (R8). These require significant mitigation and ongoing monitoring.
- Five (5) Medium risks relate to groundwater intrusion, sediment runoff, and drainage pattern changes. These are manageable with standard mitigation measures.

Critical Mitigation Measures:

1. Elevated platform design at APA PHC to design out flood risk
2. Oversized drainage designed for 1:100-year storm + 30% climate factor
3. Non-return valves and raised discharge points to prevent creek backflow
4. Sediment and erosion controls during construction (silt fences, sediment traps)
5. Zero-discharge requirement to Badagry Creek for all waste streams
6. Emergency preparedness plan for extreme hydrological events
7. Regular maintenance of drainage systems and vector control

All High and Medium–High risks are addressed through the ESMP (Chapter 7), the HMWMP (Chapter 8), and the site-specific mitigation measures (Chapter 6). Quarterly IESM audits will verify control effectiveness.